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## CRM ALPHA ALUMINA

analysis listed in mass % many other trace elements on certificate 100 g units

| Number | Alpha-Alumina | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IMS-135A | 99.02 | (99.96) | <0.01 | <0.01 | (0.002) | <0.01 | <0.01 | <0.01 | <0.001 | <0.001 | <0.01 | <0.01 | (0.15) |

## ALUMINA

# = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg T = Total

| # | Number | $Al_2O_3$ | Be* | CaO | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | MgO | MnO* | $Na_2O$ | P* | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | CERAM AN26 | 99.76 | . | 0.03 | . | 0.03 | <0.01 | <0.01 | . | 0.02 | . | . | 0.12 | <0.01 | (0.08) | 25 or 100 g |
| 2 | CERAM AN25 | 99.39 | . | 0.03 | . | 0.03 | 0.01 | <0.01 | . | 0.53 | . | <0.01 | <0.01 | <0.01 | (0.34) | 25 or 100 g |
| 1 | VS SH12/3 | 73.6 | . | 18.8 | 0.46 | 0.66T | . | 2.15 | . | . | . | . | 0.76 | . | . | 100 g |
| 1 | NCS DC62107b | 67.64 | . | 0.60 | . | 2.48 | 0.11 | 0.21 | . | 0.03 | $SO_3$:0.03 | | 10.85 | 3.14 | 14.50 | 20 g |

## CRM ALUMINA SET

SET/3 ONLY for R034, others set or individually trace informational Cl, NiO, $SO_3$ 50 g

| Number | $B_2O_3$ | CaO | CuO | $Fe_2O_3$ | $Ga_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $SiO_2$ | SrO | $TiO_2$ | ZnO | $ZrO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCRM R034 | (<0.0006) | 0.0002 | (<0.0003) | (0.0003) | 0.0021 | 0.0020 | (<0.0001) | 0.0018 | 0.0045 | (<0.0001) | (<0.0004) | (<0.0002) | (<0.0002) | 0.188 |
| JCRM R035 | (<0.0006) | 0.0188 | 0.0018 | 0.0151 | 0.0074 | 0.0005 | 0.0013 | 0.222 | 0.0116 | 0.0007 | 0.0029 | 0.0012 | 0.0009 | 0.156 |
| JCRM R036 | 0.0533 | 0.0242 | (<0.0003) | 0.0139 | 0.0076 | (0.0002) | 0.0006 | 0.0316 | 0.0569 | 0.0002 | 0.0032 | 0.0007 | 0.0004 | 0.072 |

## CRM ALUMINOUS SET

available in SET/3 only 100 g units

| Number | Type | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | $ZrO_2$+$HfO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCRM R303 | **Bauxite** | 88.49 | 0.012 | 1.51 | . | 0.006 | . | 0.064 | 5.55 | 2.93 | 0.110 | . |
| JCRM R304 | **Sillimanite** | 55.94 | 0.427 | 0.585 | 0.329 | 0.451 | 0.273 | . | 35.90 | 1.33 | 0.105 | 4.26 |
| JCRM R041 | **Mullite** | 70.18 | 0.059 | 0.598 | 0.174 | 0.190 | 0.197 | 0.136 | 28.11 | 0.185 | 0.058 | . |

## CRM ALUMINUM ELECTROLYTE SET

available only in set/7 powder 100 g

| Number | Al | $Al_2O_3$ | Ca | F | $Fe_2O_3$ | K | Li | Mg | $SiO_2$ |
|---|---|---|---|---|---|---|---|---|---|
| NCS DC91030-1 | 14.16 | 4.63 | 2.06 | 49.94 | 0.242 | 2.37 | 0.491 | 0.406 | 0.134 |
| NCS DC91030-2 | 15.55 | 6.96 | 2.41 | 50.05 | 0.113 | 1.06 | 0.625 | 0.302 | 0.120 |
| NCS DC91030-3 | 14.58 | 3.41 | 3.36 | 52.88 | 0.024 | 1.63 | 0.235 | 0.339 | (0.024) |
| NCS DC91030-4 | 12.24 | 3.43 | 5.52 | 51.41 | 0.022 | 1.21 | 0.148 | 0.249 | 0.023 |
| NCS DC91030-5 | 12.74 | 1.97 | 5.14 | 52.72 | 0.017 | 1.40 | 0.171 | 0.284 | 0.026 |
| NCS DC91030-6 | 14.84 | 2.86 | 2.79 | 53.73 | 0.018 | 1.41 | 0.223 | 0.296 | (0.021) |
| NCS DC91030-7 | 12.59 | 2.19 | 1.15 | 52.66 | 0.017 | 0.084 | 0.028 | 0.952 | (0.017) |

## CRM ALUMINUM FLUORITE

analysis listed in mass % 100 g units

| Number | F | Al | $Fe_2O_3$ | Na | $P_2O_5$ | $SiO_2$ | $SO_4$ | LOI |
|---|---|---|---|---|---|---|---|---|
| NCS DC91016 | 64.97 | 31.92 | 0.025 | 0.028 | 0.0275 | 0.196 | 0.076 | 1.25 |
| NCS DC91008 | 61.79 | 30.70 | 0.132 | 0.097 | 0.0253 | 0.104 | 0.585 | (4.61) |
| NCS DC91011 | 61.51 | 32.28 | 0.021 | 0.121 | 0.1317 | 0.429 | 0.627 | 0.754 |
| NCS DC91010 | 60.96 | 30.52 | 0.126 | 0.125 | 0.0265 | 0.251 | 0.748 | (5.48) |
| NCS DC91013 | 60.88 | 33.12 | 0.020 | 0.315 | 0.0013 | 0.017 | 0.098 | 0.467 |
| NCS DC91007 | 60.76 | 30.27 | 0.156 | 0.104 | 0.0295 | 0.146 | 0.654 | (6.00) |
| NCS DC91015 | 59.99 | 30.70 | 0.107 | 0.111 | 0.0247 | 0.301 | 0.702 | (5.61) |
| NCS DC91012 | 59.74 | 33.93 | 0.037 | 0.126 | 0.0027 | 0.016 | 0.136 | 0.547 |
| NCS DC91009 | 57.79 | 34.68 | 0.028 | 0.113 | 0.0008 | 0.015 | 0.093 | 0.662 |
| NCS DC91014 | 57.72 | 34.76 | 0.015 | 0.113 | 0.0007 | 0.014 | 0.104 | 0.640 |

## CRM ANDALUSITE

100 g units

| Number | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|
| SARM 34 | 59.15 | (0.13) | 0.75 | 0.23 | 0.13 | 0.093 | 39.04 | 0.16 | 0.62 |

## CRM ANDESITE WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | Si | $SiO_2$ | Al | $Al_2O_3$ | $CO_2$ | CaO | Fe | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JA-1 | 29.90 | 63.97 | 8.06 | 15.22 | . | 5.70 | 4.95 | 3.98 | 2.59 | 7.07 | +0.72 | -0.30 | 0.77 | 1.57 | 0.157 | 3.84 | 0.165 | 0.85 | . |
| JA-1a | . | 63.66 | . | 15.40 | . | 5.74 | . | 3.67 | . | 7.17 | . | . | 0.78 | 1.55 | 0.157 | 3.90 | 0.165 | 0.87 | . |
| GBW 07110 | . | 63.06 | . | 16.1 | 1.03 | 2.47 | . | 0.19 | 4.51 | . | +1.79 | . | 5.17 | 0.84 | 0.089 | 3.06 | 0.36 | 0.80 | . |
| JA-3 | 29.11 | 62.27 | 8.23 | 15.56 | . | 6.24 | 4.62 | 4.83 | 1.15 | 6.60 | +0.20 | -0.11 | 1.41 | 3.72 | 0.104 | 3.19 | 0.116 | 0.70 | . |
| GBW 07104 | . | 60.62 | . | 16.17 | 3.47 | 5.20 | . | 2.39 | . | 4.90 | +(1.5) | . | 1.89 | 1.72 | . | 3.86 | . | . | 4.44 |
| ~~US AGV-2a~~ | ~~27.7~~ | ~~59.3~~ | ~~8.95~~ | ~~16.91~~ | ~~.~~ | ~~5.20~~ | ~~4.68~~ | ~~.~~ | ~~.~~ | ~~6.69~~ | ~~.~~ | ~~.~~ | ~~2.88~~ | ~~1.79~~ | ~~.~~ | ~~4.19~~ | ~~0.48~~ | ~~1.05~~ | ~~.~~ |
| USZ 48-2009 | . | 59.20 | . | 16.72 | . | 5.58 | . | (1.66) | . | 5.43 | . | . | 2.42 | 3.52 | 0.081 | 4.46 | 0.264 | 0.71 | 1.39 |
| CGL 019 | . | 58.64 | . | 16.0 | . | 3.85 | . | . | . | 5.91 | (0.58) | | 4.85 | 1.74 | 0.0469 | 4.41 | 1.002 | 1.395 | (1.33) |
| JA-2 | 26.37 | 56.42 | 8.16 | 15.41 | . | 6.29 | 4.34 | 3.69 | 2.16 | 6.21 | +1.12 | -1.25 | 1.81 | 7.60 | 0.108 | 3.11 | 0.146 | 0.66 | . |

continued analysis listed in mg/kg except * which is ppb and % which is mass %

| Number | Ag | As | Au* | B | Ba | Be | Bi | Ca% | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JA-1 | . | 2.78 | 0.16 | 21.0 | 311 | 0.50 | . | 4.07 | 0.11 | 13.3 | 43.0 | 12.3 | 7.83 | 0.62 | 43.0 | 4.55 | 3.04 | 1.20 |
| JA-1a | . | . | . | . | (322) | . | . | . | . | . | . | (12.9) | (4.1) | . | (41.8) | . | . | . |
| GBW 07110 | 0.17 | 5.96 | . | 10.8 | 1053 | 3.64 | 0.09 | . | 0.61 | 117 | 160 | 7.9 | 7.7 | 7.16 | 9.1 | 5.32 | 2.93 | 1.96 |
| JA-3 | 0.084 | . | . | 24.8 | 323 | 0.80 | . | 4.46 | . | 22.8 | . | 21.1 | 66.2 | 2.08 | 43.4 | 3.01 | 1.57 | 0.82 |
| GBW 07104 | 0.071 | 2.1 | (0.95) | 4.7 | 1020 | 1.1 | 0.081 | . | 0.061 | 40 | (46) | 13.2 | 32 | 2.3 | 55 | 1.85 | 0.85 | 1.02 |
| ~~US AGV-2a~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1140~~ | ~~2.3~~ | ~~.~~ | ~~3.72~~ | ~~.~~ | ~~68~~ | ~~.~~ | ~~16~~ | ~~17~~ | ~~(1.16)~~ | ~~53~~ | ~~3.6~~ | ~~(1.79)~~ | ~~(1.54)~~ |
| USZ 48-2009 | (0.08) | (3.64) | . | . | 672 | (2.01) | (0.12) | . | (0.06) | 55.2 | . | 19.2 | 95.9 | 1.09 | 41.2 | (2.55) | (1.18) | 1.44 |
| CGL 019 | . | 6.5 | . | . | 2828 | 2.22 | (0.10) | . | . | 219 | . | 13.4 | 35 | 11.7 | 21.6 | 4.03 | 1.62 | 3.36 |
| JA-2 | . | . | 0.26 | 20.7 | 321 | 2.05 | . | 4.50 | . | 32.7 | . | 29.5 | 436 | 4.63 | 29.7 | 2.80 | 1.48 | 0.93 |

| Number | F | Ga | Gd | Ge | Hf | Hg | Ho | I | In | K% | La | Li | Lu | Mg% | Mn% | Mo | Na% | Nb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JA-1 | 161 | 16.7 | 4.36 | 1.33 | 2.42 | . | 0.95 | . | . | 0.64 | 5.24 | 10.8 | 0.47 | 0.95 | 0.122 | 1.59 | 2.85 | 1.85 |
| JA-1a | . | . | . | . | . | . | . | . | . | . | . | (11.6) | . | . | . | (1.2) | . | . |
| GBW 07110 | 1120 | 19.8 | 6.54 | 1.11 | 7.5 | 0.014 | 1.10 | 0.07 | 0.11 | . | 62.5 | 17.5 | 0.49 | . | . | 0.95 | . | 20.8 |
| JA-3 | . | 16.3 | 2.96 | . | 3.42 | . | 0.51 | . | . | 1.17 | 9.33 | 14.5 | 0.32 | 2.24 | 0.081 | 1.89 | 2.37 | 3.41 |
| GBW 07104 | 280 | 18.1 | 2.7 | 0.93 | 2.9 | 0.012 | 0.34 | (0.14) | 0.037 | . | 22 | 18.3 | 0.12 | . | 0.0604 | 0.54 | . | 6.8 |
| ~~US AGV-2a~~ | ~~(440)~~ | ~~20~~ | ~~(4.69)~~ | ~~.~~ | ~~(5.08)~~ | ~~.~~ | ~~(0.71)~~ | ~~.~~ | ~~.~~ | ~~2.39~~ | ~~38~~ | ~~(11)~~ | ~~(0.25)~~ | ~~1.08~~ | ~~0.0770~~ | ~~.~~ | ~~3.11~~ | ~~15~~ |
| USZ 48-2009 | . | 21.1 | (3.93) | . | 3.80 | (0.004) | (0.46) | . | . | . | 26.2 | (13.2) | (0.15) | . | . | (0.60) | . | 3.23 |
| CGL 019 | . | 21.7 | (7.8) | . | 8.3 | . | 0.658 | . | . | . | 112 | 22.7 | 0.179 | . | . | (1.74) | . | 14.8 |
| JA-2 | . | 16.9 | 3.06 | . | 2.86 | . | 0.50 | . | . | 1.50 | 15.8 | 27.3 | 0.27 | 4.58 | 0.084 | 0.60 | 2.31 | 9.47 |

| Number | Nd | Ni | P% | Pb | Pr | Rb | S | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Ti% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JA-1 | 10.9 | . | 0.072 | 6.55 | 1.71 | 12.3 | 21.6 | 0.22 | 28.5 | . | 3.52 | . | 263 | 0.13 | 0.75 | . | 0.82 | 0.51 |
| JA-1a | . | (2.3) | . | . | . | . | . | . | . | . | . | . | (268) | . | . | . | . | . |
| GBW 07110 | 47.2 | 12.6 | . | 97.7 | 13.2 | 183 | 230 | 1.34 | 7.52 | 0.03 | 8.63 | 3.12 | 318 | 1.42 | 0.99 | (0.007) | 16.7 | . |
| JA-3 | 12.3 | 32.2 | 0.051 | 7.70 | 2.40 | 36.7 | . | . | 22.0 | . | 3.05 | . | 287 | 0.27 | 0.52 | . | 3.25 | 0.42 |
| GBW 07104 | 19 | 17 | 0.1030 | 11.3 | 4.9 | 38 | 192 | 0.12 | 9.5 | (0.04) | 3.4 | 0.79 | 790 | 0.40 | 0.41 | 0.017 | 2.6 | 0.3090 |
| ~~US AGV-2a~~ | ~~30~~ | ~~19~~ | ~~0.21~~ | ~~13~~ | ~~8.3~~ | ~~68.6~~ | ~~.~~ | ~~(0.6)~~ | ~~13~~ | ~~.~~ | ~~(5.7)~~ | ~~(2.3)~~ | ~~658~~ | ~~(0.89)~~ | ~~(0.64)~~ | ~~.~~ | ~~6.1~~ | ~~0.63~~ |
| USZ 48-2009 | 27.2 | 61.2 | . | 18.7 | (6.77) | 49.7 | . | (0.27) | 11.8 | . | 5.16 | (0.86) | 1116 | (0.25) | 0.49 | . | 6.46 | . |
| CGL 019 | 90.7 | 27 | . | 34.1 | 25.3 | 104 | . | 8.5 | 8.6 | . | 13.2 | 1.8 | 2692 | 0.74 | 0.871 | . | 11.4 | . |
| JA-2 | 13.9 | 130 | 0.064 | 19.2 | 3.84 | 72.9 | . | . | 19.6 | . | 3.11 | 1.68 | 248 | 0.80 | 0.44 | . | 5.03 | 0.40 |

| Number | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| JA-1 | . | 0.47 | 0.34 | 105 | . | 30.6 | 3.03 | 90.9 | 88.3 | 20 g |
| JA-1a | . | . | . | (107) | . | . | . | (91) | (94.9) | 100 g |
| GBW 07110 | 1.02 | 0.50 | 3.04 | 64.3 | 1.62 | 28.0 | 3.15 | 164 | 335 | 50 g |
| JA-3 | . | . | 1.18 | 169 | . | 21.2 | 2.16 | 67.7 | 118 | 20 g |
| GBW 07104 | 0.16 | 0.15 | 0.90 | 94 | (0.45) | 9.3 | 0.89 | 71 | 99 | 70 g |
| ~~US AGV-2a~~ | ~~(0.27)~~ | ~~(0.26)~~ | ~~1.88~~ | ~~120~~ | ~~.~~ | ~~20~~ | ~~1.6~~ | ~~86~~ | ~~230~~ | ~~25 g~~ |
| USZ 48-2009 | (0.22) | (0.17) | 1.96 | 123 | (1.70) | 11.8 | 1.00 | 71.5 | 141 | 100 g |
| CGL 019 | (0.45) | 0.207 | 1.72 | 102 | (0.93) | 17.7 | 1.231 | 89 | 368 | 100 g |
| JA-2 | 0.32 | 0.28 | 2.21 | 126 | . | 18.3 | 1.62 | 64.7 | 116 | 20 g |

## CRM ANHYDRITE

analysis listed in mass % 50 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $SO_3$ | $SiO_2$ | Sr | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW AN | (0.023) | 0.65 | 40.7 | 0.014 | (0.5) | 0.013 | 0.34 | (0.002) | 0.032 | 57.6 | (0.22) | 0.14 | (0.003) |

continued analysis listed in mg/kg

| Number | B | Ba | Cl | Cr | Cs | Cu | Ga | Li | Mo | Rb | Sb | Ta | Th | V | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW AN | 100 | 14.8 | 0.033 | 0.90 | 0.037 | 4 | 4.3 | 9 | 1.2 | 4.7 | 0.044 | 0.007 | 0.048 | 18 | 7.9 | 13 |

## CRM ANORTHOSITE

analysis listed in mass % — 40 g units

| Number | $SiO_2$ | $Al_2O_3$ | Ba | CaO | $CO_2$ | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | $H_2O+$ | $T.H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS MO11~~ | ~~53.46~~ | ~~27.42~~ | ~~0.0319~~ | ~~10.95~~ | ~~0.0~~ | ~~1.09~~ | ~~0.53~~ | ~~1.74~~ | ~~0.088~~ | ~~0.33~~ | ~~0.42~~ | ~~0.65~~ | ~~0.49~~ | ~~0.037~~ | ~~4.39~~ | ~~0.041~~ | ~~0.0100~~ | ~~0.18~~ |
| VS 2120-81 | 51.77 | 22.78 | 0.051 | 10.06 | 0.36 | 4.66 | 6.26 | . | 0.40 | . | . | 0.76 | 2.10 | 0.076 | 4.04 | 0.140 | 0.069 | 1.87 |
| ~~VS MO10~~ | ~~51.65~~ | ~~23.91~~ | ~~0.0294~~ | ~~10.18~~ | ~~0.14~~ | ~~4.40~~ | ~~1.45~~ | ~~6.34~~ | ~~0.095~~ | ~~0.26~~ | ~~0.36~~ | ~~0.50~~ | ~~2.24~~ | ~~0.073~~ | ~~3.99~~ | ~~0.13~~ | ~~0.0460~~ | ~~0.83~~ |

continued analysis listed in mg/kg except % which is mass %

| Number | B | Be | Co | Cr | Cs | Cu | F | Ga | La | Li | Mo | Nb | Ni | Pb | Rb | Sc | Sn | Sr | V% | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS MO11~~ | ~~4.5~~ | ~~0.8~~ | ~~9.6~~ | ~~12~~ | ~~0.73~~ | ~~26~~ | ~~420~~ | ~~21~~ | ~~20~~ | ~~7.5~~ | ~~1.2~~ | ~~2.6~~ | ~~14~~ | ~~6.8~~ | ~~2.7~~ | ~~5~~ | ~~5.1~~ | ~~802~~ | ~~0.0024~~ | ~~8~~ | ~~1.1~~ | ~~50~~ | ~~42~~ |
| VS 2120-81 | . | 0.9 | 23 | 36 | . | 31 | . | 17 | . | . | . | . | 10 | 7 | . | 23 | . | . | 0.013 | . | . | 83 | 72 |
| ~~VS MO10~~ | ~~8.7~~ | ~~1.1~~ | ~~27~~ | ~~23~~ | ~~0.55~~ | ~~44~~ | ~~380~~ | ~~26~~ | ~~24~~ | ~~7.1~~ | ~~2.0~~ | ~~3.9~~ | ~~32~~ | ~~8.0~~ | ~~5.5~~ | ~~11~~ | ~~5.0~~ | ~~477~~ | ~~0.0109~~ | ~~17~~ | ~~2.0~~ | ~~96~~ | ~~58~~ |

## CRM ANTIMONY ORE

analysis listed in mass % — 200 g units

| Number | Al | As | C | Ca | Cu | Fe | $H_2O$ | K | Mg | Na | Pb | S | Sb | Si | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN CD-1 | (5.5) | 0.66 | (0.2) | (1.4) | (<0.01) | (2.8) | (0.2) | (1.8) | (0.6) | (0.1) | (0.02) | (3.1) | 3.57 | (32.9) | (4.0) |

## CRM ANTIMONY ORE

analysis listed in mass % — analysis in mg/kg * Sb calculated from certified results for 4ACID, ICP, and XRF

| Number | Sb | Pb | S | Se | Zn | Ag | As | Au | Bi | Cd | Co | Cu | Ga | Li | Nb | Ni | Sn | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GSb-3 * | 53.69 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| ~~GSb-2~~ | ~~31.0838~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~23.64~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~10 g~~ |
| GSb-11 * | 21.10 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-10 * | 11.66 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-6 * | 9.88 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-9 * | 6.50 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-4 * | 3.43 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| ~~NCS DC70013~~ | ~~1.81~~ | ~~0.012~~ | ~~1.02~~ | ~~0.018~~ | ~~0.037~~ | ~~7.3~~ | ~~25.3~~ | ~~.~~ | ~~(0.24)~~ | ~~2.6~~ | ~~2.2~~ | ~~51.3~~ | ~~9.1~~ | ~~22.8~~ | ~~5.4~~ | ~~3.2~~ | ~~3.0~~ | ~~50 g~~ |
| GSb-7 * | 1.75 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-8 * | 1.63 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-5 * | 0.18 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |
| GSb-1 | 0.1636 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 g |

## CRM ARAGONITE/CALCITE

100 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | F | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | SrO | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS AK | 0.11 | 43.0 | 54.9 | 0.20 | 0.130 | 0.037 | 0.110 | 0.047 | 0.029 | 0.046 | 0.64 | 0.28 | 43.27 |

## CRM ASCHARITE ORE

| Number | $B_2O_3$ | CaO | T.Fe | FeO | MgO | P | S | $SiO_2$ | Ins.Res. | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC16005 | 5.65 | 0.15 | 52.98 | 26.13 | 11.64 | 0.016 | 1.242 | 4.51 | 4.72 | 100 g |

## CRM BARITE ORE

70 g units

| Number | BaO | $BaSO_4$ | $CaF_2$ | Cu | $T.Fe_2O_3$ | Pb | Salt | $SO_3$ | Sr | Zn |
|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86002 | 65.40 | 98.47 | . | (0.00029) | . | . | (0.11) | 34.37 | 0.10 | (0.00060) |
| NCS DC86004 | 57.36 | 86.14 | . | 0.00421 | . | . | (0.13) | 31.44 | 1.22 | (0.00056) |
| NCS DC86005 | 44.80 | 66.93 | . | 0.0129 | . | . | (0.21) | 24.50 | 1.12 | 0.00269 |
| NCS DC86003 | 28.36 | 41.46 | 14.03 | 0.00067 | . | . | (0.37) | 14.99 | 0.054 | 0.00124 |
| NCS DC86001 | 28.34 | 42.41 | . | 0.0109 | 49.37 | . | (0.28) | 15.94 | 0.39 | 0.00223 |
| NCS DC86007 | 27.01 | 40.54 | . | 0.00102 | . | . | (0.21) | 13.95 | 0.059 | 0.00364 |
| NCS DC86006 | 13.00 | 18.87 | . | 0.14 | 20.96 | 0.41 | 0.93 | 51.33 | 0.058 | 3.76 |

## CRM BASALT WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | $H_2O+$ | $T.H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US BCR-2~~ | ~~54.1~~ | ~~13.5~~ | ~~.~~ | ~~7.12~~ | ~~.~~ | ~~.~~ | ~~13.8~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.79~~ | ~~3.59~~ | ~~.~~ | ~~3.16~~ | ~~0.35~~ | ~~2.26~~ |
| JB-2 | 53.25 | 14.64 | . | 9.82 | 9.98 | 3.33 | 14.25 | 0.13- | 0.25 | . | 0.42 | 4.62 | 0.218 | 2.04 | 0.101 | 1.19 |
| JB-2a | 53.22 | 14.67 | . | 9.79 | 9.83 | . | 14.18 | . | . | . | 0.41 | 4.58 | 0.214 | 2.03 | 0.095 | 1.18 |
| USZ 46-2008 | 51.85 | 14.50 | . | 5.41 | 6.15 | 9.85 | . | . | . | . | 3.99 | 6.33 | 0.13 | 4.40 | 0.85 | 2.11 |
| JB-1b | 51.11 | 14.38 | . | 9.6 | 5.16 | 3.29 | 9.02 | 1.06- | 1.53 | . | 1.32 | 8.14 | 0.147 | 2.63 | 0.256 | 1.26 |
| JB-3 | 50.96 | 17.20 | . | 9.79 | 7.85 | 3.20 | 11.82 | 0.07- | 0.18 | . | 0.78 | 5.19 | 0.177 | 2.73 | 0.294 | 1.44 |
| JB-3a | 50.87 | 17.16 | . | 9.75 | 7.71 | . | 11.83 | . | . | . | 0.78 | 5.17 | 0.179 | 2.74 | 0.291 | 1.44 |
| ~~US BHVO-2~~ | ~~49.9~~ | ~~13.5~~ | ~~.~~ | ~~11.4~~ | ~~.~~ | ~~.~~ | ~~12.3~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.52~~ | ~~7.23~~ | ~~.~~ | ~~2.22~~ | ~~0.27~~ | ~~2.73~~ |
| VS MO15 | 49.55 | 16.93 | 0.20 | 8.30 | 4.60 | 4.96 | 10.07 | 0.32- | 1.34 | 1.66 | 1.51 | 5.23 | 0.059 | 4.35 | 0.39 | 1.68 |
| GUW BM | 49.51 | 16.25 | 1.35 | 6.47 | 7.28 | 9.67 | . | 3.62 | . | . | 0.20 | 7.47 | 0.140 | 4.65 | 0.106 | 1.14 |
| VS 2116-81 | 49.15 | 16.53 | (0.13) | 18.87 | 7.71 | 1.07 | . | 1.34 | . | . | 0.98 | 6.56 | 0.164 | 3.74 | 0.40 | 1.65 |
| SRM 688 | 48.4 | 17.36 | . | (12.17) | 7.64 | 10.35 | . | . | . | . | 0.187 | (8.4) | . | 2.15 | 0.134 | 1.17 |
| CGL 014 | 48.34 | 13.03 | . | 8.88 | (7.91) | . | 12.66 | (0.13) | (0.37) | . | 1.72 | 8.03 | 0.15 | 3.63 | 0.70 | 2.68 |
| ~~US BIR-1a~~ | ~~47.96~~ | ~~15.5~~ | ~~.~~ | ~~13.3~~ | ~~8.34~~ | ~~2.06~~ | ~~11.3~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.030~~ | ~~9.70~~ | ~~0.175~~ | ~~1.82~~ | ~~0.021~~ | ~~0.96~~ |
| ~~VS MO14~~ | ~~46.85~~ | ~~17.06~~ | ~~0.0~~ | ~~9.60~~ | ~~6.83~~ | ~~3.26~~ | ~~10.85~~ | ~~0.81~~ | ~~1.73~~ | ~~2.54~~ | ~~(0.46)~~ | ~~8.05~~ | ~~0.15~~ | ~~3.00~~ | ~~0.37~~ | ~~1.62~~ |

**~~Olivine~~**

continued analysis listed in mg/kg except % which is mass % and * which is ppb

| Number | Ag | Al% | As | Au* | B | Ba | Be | Bi | C | Ca% | Cd | Ce | Cl | Co | Cr | Cs | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US BCR-2~~ | ~~.~~ | ~~7.14~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~683~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~5.09~~ | ~~.~~ | ~~53~~ | ~~.~~ | ~~37~~ | ~~18~~ | ~~(1.1)~~ | ~~(19)~~ |
| JB-2 | (0.072) | 7.75 | 2.87 | 5.64 | 30.2 | 222 | (0.26) | (0.033) | (0.0218) | 7.02 | 0.14 | 6.76 | 281 | 38 | 28.1 | 0.85 | 225 |
| JB-2a | . | . | . | . | . | (222) | . | . | . | . | . | . | . | (39) | (28) | . | (272) |
| USZ 46-2008 | . | | . | | | 772 | 2.81 | . | . | . | . | 103 | . | 36.3 | 222 | 1.15 | 32.21 |
| JB-1b | . | . | 1.24 | . | . | . | 1.3 | . | 419 | . | . | . | . | 40.3 | 439 | 1.21 | 55.5 |
| JB-3 | 0.075 | 9.10 | 1.84 | 1.99 | 18.0 | 245 | 0.81 | . | (120) | 7.00 | 0.081 | 21.5 | (259) | 34.3 | 58.1 | 0.94 | 194 |
| JB-3a | . | . | . | . | . | (244) | (0.69) | . | . | . | . | . | . | (35.5) | (57) | . | (195) |
| ~~US BHVO-2~~ | ~~.~~ | ~~7.16~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~130~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~8.17~~ | ~~.~~ | ~~38~~ | ~~.~~ | ~~45~~ | ~~280~~ | ~~.~~ | ~~127~~ |
| VS MO15 | . | . | . | . | 9.9 | 225 | 2.2 | . | . | . | . | . | . | 34 | 136 | 1.4 | 28 |
| GUW BM | (0.8) | . | 13 | . | (12) | 250 | 1.3 | . | . | . | . | . | . | 36 | 121 | 2.0 | 43 |
| VS 2116-81 | . | . | . | . | . | 300 | 2.3 | . | . | . | . | . | . | 37 | 99 | . | 61 |
| SRM 688 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 332 | . | . |
| CGL 014 | . | . | . | . | . | 474 | . | . | . | . | . | 67.51 | . | 46.50 | 188 | (0.6) | 64.00 |
| ~~US BIR-1a~~ | ~~.~~ | ~~.~~ | ~~(0.44)~~ | ~~.~~ | ~~(0.33)~~ | ~~(6)~~ | ~~(0.58)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.9~~ | ~~(26)~~ | ~~52~~ | ~~370~~ | ~~.~~ | ~~125~~ |
| ~~VS MO14~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~8.7~~ | ~~172~~ | ~~1.9~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~50~~ | ~~152~~ | ~~1.5~~ | ~~66~~ |

| Number | Dy | Er | Eu | F% | Fe | Ga | Gd | Ge | Hf | Hg | Ho | In | K% | La | Li | Lu | Mg% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US BCR-2~~ | ~~.~~ | ~~.~~ | ~~2.0~~ | ~~(0.0440)~~ | ~~9.65~~ | ~~23~~ | ~~6.8~~ | ~~.~~ | ~~(4.8)~~ | ~~.~~ | ~~(1.33)~~ | ~~.~~ | ~~1.49~~ | ~~25~~ | ~~(9)~~ | ~~(0.51)~~ | ~~2.16~~ |
| JB-2 | 3.73 | 2.6 | 0.86 | 0.00985 | 9.97 | 17 | 3.28 | 1.35 | 1.49 | 0.00478 | 0.75 | 0.094 | 0.35 | 2.35 | 7.78 | 0.4 | 2.79 |
| JB-2a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | (7.9) | . | . |
| USZ 46-2008 | 4.67 | 1.84 | 2.62 | . | . | 22.63 | 7.17 | 1.29 | 6.63 | . | 0.78 | . | . | 55.99 | 11.08 | 0.19 | . |
| JB-1b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10.8 | . | . |
| JB-3 | 4.54 | 2.49 | 1.32 | 0.0253 | 8.27 | 19.8 | 4.67 | 1.12 | 2.67 | (0.0024) | 0.80 | . | 0.65 | 8.81 | 7.21 | 0.39 | 3.13 |
| JB-3a | . | . | . | . | . | . | . | . | . | . | . | . | . | (7.3) | . | . | . |
| ~~US BHVO-2~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.0370)~~ | ~~8.63~~ | ~~21.7~~ | ~~(6.3)~~ | ~~.~~ | ~~4.1~~ | ~~.~~ | ~~(1.04)~~ | ~~.~~ | ~~0.43~~ | ~~15~~ | ~~(5)~~ | ~~(0.28)~~ | ~~4.36~~ |
| VS MO15 | . | . | . | 0.1600 | . | 20 | . | . | . | . | . | . | . | 69 | 16 | . | . |
| GUW BM | (4.6) | (2.7) | 1.12 | 0.028 | . | 16 | (5.8) | (1.3) | 3.0 | . | (1.4) | . | . | 9 | 72 | 0.41 | . |
| VS 2116-81 | . | . | . | 0.0480 | . | 22 | . | 1.1 | . | . | . | . | . | 4.0 | 9.3 | . | . |
| SRM 688 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| CGL 014 | (5.23) | (2.21) | (2.48) | (0.08) | . | 21.20 | (7.3) | . | (5.25) | . | (0.91) | . | . | 35.11 | (9.33) | (0.22) | . |
| ~~US BIR-1a~~ | ~~4~~ | ~~.~~ | ~~0.55~~ | ~~(0.0044)~~ | ~~.~~ | ~~(16)~~ | ~~2~~ | ~~.~~ | ~~0.6~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.63~~ | ~~3.6~~ | ~~(0.3)~~ | ~~.~~ |
| ~~VS MO14~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0470~~ | ~~.~~ | ~~15~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~34~~ | ~~7.5~~ | ~~.~~ | ~~.~~ |

| Number | Mn% | Mo | Na% | Nb | Nd | Ni | P% | Pb | Pr | Rb | S | Sb | Sc | Se | Si% | Sm | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US BCR-2~~ | ~~0.1520~~ | ~~248~~ | ~~2.34~~ | ~~.~~ | ~~28~~ | ~~.~~ | ~~0.15~~ | ~~(11)~~ | ~~(6.8)~~ | ~~48~~ | ~~.~~ | ~~.~~ | ~~33~~ | ~~.~~ | ~~25.3~~ | ~~(6.7)~~ | ~~.~~ |
| JB-2 | 0.169 | 1.08 | 1.51 | (1.58) | 6.63 | 16.6 | 0.044 | 5.36 | 1.01 | 7.37 | 0.00179 | 0.25 | 53.5 | (0.19) | 24.89 | 2.31 | 0.95 |
| JB-2a | . | . | . | . | . | (15.5) | . | . | . | (7.2) | . | . | . | . | . | . | . |
| USZ 46-2008 | . | 5.20 | . | 52.21 | 46.62 | 162 | . | 8.70 | 11.90 | 63.05 | . | 0.28 | 10.10 | . | . | 8.72 | 2.66 |
| JB-1b | . | . | . | . | . | 148 | . | 6.8 | . | 39.1 | 10 | 0.2 | . | . | . | . | . |
| JB-3 | 0.137 | 1.09 | 2.03 | 2.47 | 15.6 | 36.2 | 0.128 | 5.58 | 3.11 | 15.1 | 9.86 | 0.12 | 33.8 | (0.069) | 23.82 | 4.27 | 0.94 |
| JB-3a | . | . | . | . | . | (39) | . | (5.7) | . | (15.1) | . | . | . | . | . | . | . |
| ~~US BHVO-2~~ | ~~0.1290~~ | ~~.~~ | ~~1.64~~ | ~~(18)~~ | ~~25.0~~ | ~~119~~ | ~~0.12~~ | ~~.~~ | ~~.~~ | ~~9.8~~ | ~~.~~ | ~~.~~ | ~~32~~ | ~~.~~ | ~~23.3~~ | ~~(6.2)~~ | ~~(1.9)~~ |
| VS MO15 | . | 3.4 | . | 13 | . | 90 | . | 8.8 | . | 50 | 160 | . | 29 | . | . | . | 4.2 |
| GUW BM | . | (0.8) | . | . | 15 | 57 | . | 13 | (3.0) | 10 | . | 2.3 | 34 | . | . | 3.6 | . |
| VS 2116-81 | . | 1.8 | . | . | . | 86 | . | 12 | . | 14 | (90) | . | 22 | . | . | . | 7.0 |
| SRM 688 | 0.167 | . | . | . | . | . | . | . | . | 1.91 | . | . | . | . | . | . | . |
| CGL 014 | . | (2.92) | . | 56.50 | 36.33 | 163 | . | 5.66 | (8.19) | 28.60 | SO3: | (0.10) | 19.33 | . | . | (7.74) | . |
| ~~US BIR-1a~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.6)~~ | ~~2.5~~ | ~~170~~ | ~~.~~ | ~~(3)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.58)~~ | ~~44~~ | ~~.~~ | ~~.~~ | ~~(1.1)~~ | ~~.~~ |
| ~~VS MO14~~ | ~~.~~ | ~~2.5~~ | ~~.~~ | ~~11~~ | ~~.~~ | ~~111~~ | ~~.~~ | ~~8.6~~ | ~~.~~ | ~~4.0~~ | ~~60~~ | ~~.~~ | ~~25~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~2.4~~ |

| Number | Sr | Ta | Tb | Th | Ti% | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US BCR-2~~ | ~~346~~ | ~~.~~ | ~~(1.07)~~ | ~~6.2~~ | ~~1.35~~ | ~~.~~ | ~~(0.54)~~ | ~~1.69~~ | ~~416~~ | ~~.~~ | ~~37~~ | ~~3.5~~ | ~~127~~ | ~~188~~ | ~~.~~ | ~~50 g~~ |
| JB-2 | 178 | 0.13 | 0.6 | 0.35 | 0.71 | (0.042) | 0.41 | 0.18 | 575 | (0.26) | 24.9 | 2.62 | 108 | 51.2 | . | 20 g |
| JB-2a | (179) | . | . | . | . | . | . | . | (574) | . | (25.4) | . | (108) | (61.8) | . | 100 g |
| USZ 46-2008 | 927 | 3.20 | 0.95 | 6.95 | | 0.12 | 0.23 | 1.64 | 105 | 1.15 | 20.48 | 1.34 | 114 | 287 | . | 100 g |
| JB-1b | 439 | . | . | . | . | . | . | . | 214 | . | . | . | 80 | . | . | 100 g |
| JB-3 | 403 | 0.15 | 0.73 | 1.27 | 0.86 | 0.048 | 0.42 | 0.48 | 372 | (1.06) | 26.9 | 2.55 | 100 | 97.8 | . | 20 or 100 g |
| JB-3a | (405) | . | . | . | . | . | . | . | (377) | . | (27.7) | . | (102) | (100) | . | 100 g |
| ~~US BHVO-2~~ | ~~389~~ | ~~(1.4)~~ | ~~(0.9)~~ | ~~(1.2)~~ | ~~1.63~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~317~~ | ~~.~~ | ~~26~~ | ~~(20)~~ | ~~103~~ | ~~172~~ | ~~.~~ | ~~50 g~~ |
| VS MO15 | 554 | . | . | . | . | . | . | . | 234 | . | 39 | 2.6 | 33 | 152 | . | 40 g |
| GUW BM | 220 | (0.3) | 0.9 | (3.0) | . | . | . | (1.1) | 190 | 0.9 | 27 | 3.0 | 120 | 100 | . | 50 g |
| VS 2116-81 | 500 | . | . | . | . | . | . | . | 150 | . | 29 | 2.6 | 82 | 190 | . | 40 g |
| SRM 688 | 169.2 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 60 g |
| CGL 014 | 741 | (3.24) | (1.02) | (4.76) | . | . | (0.27) | (0.93) | 197 | (3.41) | 23.60 | (1.69) | 133 | 201 | (0.17) | 100 g |
| ~~US BIR-1a~~ | ~~110~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~310~~ | ~~.~~ | ~~16~~ | ~~1.7~~ | ~~70~~ | ~~18~~ | ~~.~~ | ~~25 g~~ |
| ~~VS MO14~~ | ~~468~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~181~~ | ~~.~~ | ~~39~~ | ~~3.0~~ | ~~108~~ | ~~162~~ | ~~.~~ | ~~40 g~~ |

## BAUXITE

# = class, 1=CRM and 2=RM **17034**

| # | Number | $Al_2O_3$ | $A.Al_2O_3$ | CaO | $Cr_2O_3$ | Fe | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $R.SiO_2$ | $TiO_2$ | $V_2O_5$ | $ZrO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BCS 394/1 | 88.88 | . | 0.0173 | . | . | 1.372 | . | 0.0047 | . | 0.0574 | 6.47 | . | 2.969 | . | . | . |
| 1 | NCS HC28815 | 88.55 | . | 0.15 | . | . | 1.75 | 0.11 | 0.073 | 0.017 | 0.23 | 4.88 | . | 3.69 | . | . | . |
| 1 | NCS DC14223 | 88.34 | . | 0.29 | . | . | 1.24 | 0.078 | 0.4 | 0.28 | 0.11 | 6.97 | . | 1.57 | . | . | 0.66 |
| 1 | NCS DC14222 | 87.5 | . | 0.58 | . | . | 1.61 | 0.087 | 0.12 | 0.15 | 0.13 | 6.01 | . | 3.14 | . | . | 0.61 |
| 1 | JCRM R301 | 87.5 | . | 0.03 | . | . | 1.40 | 0.04 | 0.02 | 0.03 | 0.07 | 7.24 | . | 2.90 | . | 0.13* | 0.35 |
| 1 | NCS DC61105 | 85.07 | . | 0.24 | . | . | 1.18 | 0.44 | 0.21 | 0.080 | . | 8.17 | . | 3.76 | . | . | 0.29 |
| 1 | NCS DC14221 | 83.61 | . | 0.45 | . | . | 1.71 | 0.2 | 0.18 | 0.036 | 0.22 | 10.07 | . | 3.27 | . | . | 0.098 |
| 1 | NCS HC28814 | 83.07 | . | 0.22 | . | . | 2.71 | 0.17 | 0.088 | 0.022 | 0.18 | 9.69 | . | 3.64 | . | . | 0.15 |
| 1 | NCS DC91017 | 71.14 | . | 0.75 | . | . | 2.01 | 0.477 | 0.090 | 0.022 | 0.221 | 3.16 | . | 3.04 | . | . | . |
| 1 | NCS HC28813 | 70.28 | . | 0.37 | . | . | 6.64 | 0.20 | 0.18 | 0.051 | 0.25 | 14.20 | . | 2.85 | . | . | 4.57 |
| 1 | NCS DC91018 | 64.53 | . | 0.26 | . | . | 6.06 | 0.22 | 0.246 | 0.030 | 0.185 | 8.02 | . | 2.59 | . | . | . |
| 1 | NCS DC14220 | 63.53 | . | 0.98 | . | . | 1.97 | 0.35 | 1.93 | 0.21 | 0.26 | 26.56 | . | 2.59 | . | . | 1.39 |
| 1 | NCS HC28812 | 60.41 | . | 0.51 | . | . | 9.69 | 0.22 | 0.26 | 0.070 | 0.30 | 17.82 | . | 2.22 | . | . | 7.96 |
| 1 | DSZU 123.62-13 | 57.4 | . | 0.12 | 0.035 | . | 0.88 | . | 0.075 | . | 0.073 | 8.73 | . | 2.51 | 0.044 | . | . |
| ~~1~~ | ~~NCS DC91019~~ | ~~57.15~~ | ~~.~~ | ~~0.089~~ | ~~.~~ | ~~.~~ | ~~16.11~~ | ~~1.00~~ | ~~0.235~~ | ~~0.31~~ | ~~0.077~~ | ~~6.31~~ | ~~.~~ | ~~2.65~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| 1 | SRM 696 | 54.5 | . | 0.018 | 0.047 | . | 8.70 | 0.009 | 0.012 | (0.007) | 0.050 | 3.79 | . | 2.64 | 0.072 | 0.14 | 29.9 |
| 1 | IPT 131 | 54.1 | . | . | . | . | 11.5 | 0.022 | . | . | 0.15 | 0.78 | . | 1.77 | 0.042 | 0.35 | 30.0 |
| 1 | BCS 395 | 52.4 | . | 0.05 | (0.07) | . | 16.3 | (0.02) | 0.02 | (0.02) | . | 1.24 | . | 1.93 | . | . | 27.8 |
| 1 | SRM 69b | 48.8 | . | 0.13 | 0.011 | . | 7.14 | 0.068 | 0.085 | (0.025) | 0.118 | 13.43 | . | 1.90 | 0.028 | 0.29 | 27.2 |
| 1 | SRM 698 | 48.2 | . | 0.62 | 0.080 | . | 19.6 | 0.010 | 0.058 | . | 0.37 | 0.69 | . | 2.38 | 0.064 | 0.061 | 27.3 |
| 1 | **IMS-469** | 47.19 | . | (0.013) | 0.098 | . | 23.20 | 0.022 | 0.025 | 0.017 | 0.091 | 2.26 | . | 2.56 | 0.129 | 0.088 | 24.33 |
| 1 | **IMS PBS-75** | 46.76 | . | 0.022 | 0.045 | . | 19.15 | 0.024 | 0.070 | 0.027 | 0.070 | 15.90 | . | 2.53 | 0.060 | 0.122 | 15.22 |
| 1 | NCS HC28811 | 46.52 | . | 0.69 | . | . | 14.01 | 0.25 | 0.37 | 0.10 | 0.35 | 22.96 | . | 1.36 | . | . | 12.75 |
| 1 | **IMS-470** | 46.32 | . | (0.010) | 0.099 | . | 23.90 | 0.023 | 0.026 | 0.018 | 0.093 | 2.32 | . | 2.52 | 0.132 | 0.087 | 24.53 |
| 1 | SRM 697 | 45.8 | . | 0.71 | 0.100 | . | 20.0 | 0.062 | 0.18 | . | 0.97 | 6.81 | . | 2.52 | 0.063 | 0.065 | 22.1 |
| 1 | **IMS-471** | 44.24 | . | (0.010) | 0.091 | . | 26.87 | 0.037 | 0.029 | 0.019 | 0.108 | 2.82 | . | 2.40 | 0.142 | 0.092 | 23.15 |
| 1 | DSZU 123.61-13 | 42.8 | . | 0.13 | 0.22 | . | 27.2 | . | 0.046 | . | 0.086 | 3.36 | . | 2.15 | 0.071 | . | . |
| 1 | **IMS PBS-74** | 42.53 | . | 0.016 | 0.041 | . | 19.73 | 0.019 | 0.050 | 0.025 | 0.043 | 18.41 | . | 1.86 | 0.064 | 0.072 | 17.2 |
| 1 | **IMS PBS-62** | 40.39 | . | 0.038 | 0.068 | . | 27.44 | 0.039 | 0.066 | 0.034 | 0.051 | 9.59 | . | 3.77 | 0.118 | 0.099 | 18.33 |
| 1 | GBAP-17 | 40.01 | . | 0.041 | . | . | 18.42 | 0.184 | . | 0.030 | 0.080 | 16.02 | . | 1.62 | 0.042 | . | 19.79 |
| 1 | SRM 600 | 40.0 | . | 0.22 | 0.024 | . | 17.0 | 0.23 | 0.05 | 0.022 | 0.039 | 20.3 | . | 1.31 | 0.060 | 0.060 | 20.5 |
| 1 | GBAP-18 | 39.77 | . | 0.010 | . | . | 18.44 | 0.256 | . | 0.015 | 0.049 | 19.00 | . | 1.35 | 0.059 | . | 20.8 |
| # | Number | $Al_2O_3$ | $A.Al_2O_3$ | CaO | $Cr_2O_3$ | Fe | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $R.SiO_2$ | $TiO_2$ | $V_2O_5$ | $ZrO_2$ | LOI |

$A.Al_2O_3$: Available Alumina  $R.SiO_2$: Reactive Silica  * Includes $HfO_2$

| Number | BaO | C | $Ga_2O_3$ | MnO | S | $SO_3$ | ZnO | Units |
|---|---|---|---|---|---|---|---|---|
| BCS 394/1 | . | . | . | . | . | . | . | 100 g |
| NCS HC28815 | . | 0.018 | . | . | . | . | . | 50 g |
| NCS DC14223 | . | . | . | . | . | . | . | 50 g |
| NCS DC14222 | . | . | . | . | . | . | . | 50 g |
| JCRM R301 | . | . | . | . | . | . | . | 100 g |
| NCS DC61105 | . | . | . | . | . | . | . | 50 g |
| NCS DC14221 | . | . | . | . | . | . | . | 50 g |
| NCS HC28814 | . | 0.050 | . | 0.011 | . | . | . | 50 g |
| NCS DC91017 | . | . | 0.0114 | 0.036 | 0.031 | . | 0.0018 | 50 g |
| NCS HC28813 | . | 0.099 | . | 0.053 | . | . | . | 50 g |
| NCS DC91018 | . | . | 0.0106 | 0.012 | 0.040 | . | 0.0040 | 50 g |
| NCS DC14220 | . | . | . | . | . | . | . | 50 g |
| NCS HC28812 | . | 0.014 | . | 0.082 | . | . | . | 50 g |
| DSZU 123.62-13 | . | 0.10 | 0.013 | 0.009 | 0.030 | . | $CO_2$:0.09 | 100 g |
| ~~NCS DC91019~~ | ~~.~~ | ~~.~~ | ~~0.008~~ | ~~0.021~~ | ~~0.033~~ | ~~.~~ | ~~0.0036~~ | ~~50 g~~ |
| SRM 696 | . | . | . | 0.004 | . | 0.150 | 0.0014 | 60 g |
| IPT 131 | . | . | . | 0.31 | . | . | 0.013 | 70 g |
| BCS 395 | . | . | . | . | . | . | . | 100 g |
| SRM 69b | . | . | . | 0.110 | . | 0.551 | 0.0035 | 60 g |
| SRM 698 | . | . | . | 0.38 | . | 0.143 | 0.029 | 60 g |
| **IMS-469** | (0.007) | 0.16 | OrgC:0.11 | 0.015 | . | 0.060 | . | 10 g |
| **IMS PBS-75** | (0.013) | . | . | 0.042 | . | 0.061 | . | 250 g |
| NCS HC28811 | . | 0.20 | . | 0.13 | . | . | . | 50 g |
| **IMS-470** | (0.007) | 0.16 | OrgC:0.11 | 0.015 | . | 0.061 | . | 10 g |
| SRM 697 | . | . | . | 0.41 | . | 0.0770 | 0.037 | 60 g |
| **IMS-471** | (0.007) | 0.17 | OrgC:0.12 | 0.014 | . | 0.073 | . | 10 g |
| DSZU 123.61-13 | . | 0.22 | 0.009 | 0.023 | S:0.045 | . | $CO_2$:0.19 | 100 g |
| **IMS PBS-74** | (0.009) | . | . | 0.010 | . | 0.034 | . | 250 g |
| **IMS PBS-62** | . | . | . | 0.020 | . | 0.074 | . | 250 g |
| GBAP-17 | . | . | 0.009 | . | . | 1.20 | . | 10 g |
| SRM 600 | . | . | . | 0.013 | . | 0.155 | 0.003 | 90 g |
| GBAP-18 | . | . | 0.009 | . | . | 0.21 | . | 10 g |
| Number | BaO | C | $Ga_2O_3$ | MnO | S | $SO_3$ | ZnO | Units |

## RM BAUXITE

$Al_2O_3$: Available Alumina  C.Org: Organic Carbon  BXT-04, BXT-06 500 g units  others 100 g

| Number | $Al_2O_3$ | C.Org | CaO | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | $V_2O_5$ | ZnO | $ZrO_2$ | $A.Al_2O_3$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALC-BXT-10 | 54 | (0.08) | (<0.01) | (0.03) | 12.4 | (<0.01) | . | (0.01) | . | (0.05) | . | 2.7 | 2.01 | (0.06) | . | (0.07) | . | 28.6 |
| ALC-BXT-09 | 53.4 | (0.2) | (0.01) | 0.037 | 14.5 | (0.01) | (0.03) | (0.04) | (0.01) | (0.07) | (0.06) | 7.57 | 2.98 | (0.06) | (0.002) | (0.12) | . | 20.8 |
| ALC-BXT-13 | 53.4 | 0.051 | (0.02) | 0.016 | 11.44 | (0.01) | (0.01) | (0.01) | (0.01) | (0.02) | (0.09) | 4.82 | 1.54 | (0.04) | (0.002) | (0.08) | 53.3 | 28.52 |
| ALC-BXT-08 | 51.5 | (0.082) | (0.02) | (0.049) | 9.6 | (0.018) | (0.03) | (0.021) | (0.02) | (0.26) | . | 3.2 | 9.5 | (0.17) | (0.006) | (0.089) | . | 25.6 |
| ALC-BXT-14 | 51.2 | 0.162 | (0.01) | (0.01) | 13.17 | (0.01) | (0.01) | (0.02) | (0.01) | (0.062) | (0.11) | 5.86 | 1.11 | (0.01) | (0.005) | 0.131 | 50.4 | 28.35 |

## CRM BERYLLIUM ORE

analysis listed in mass %

| Number | BeO | $Al_2O_3$ | CaO | F | FeO | $T.Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~NCS DC86313~~ | ~~3.02~~ | ~~15.55~~ | ~~0.52~~ | ~~0.0088 (F-)~~ | ~~0.15~~ | ~~0.47~~ | ~~(0.63)~~ | ~~3.28~~ | ~~0.083~~ | ~~0.020~~ | ~~3.63~~ | ~~(0.018)~~ | ~~71.97~~ | ~~0.010~~ | ~~0.86~~ | ~~50 g~~ |
| NCS DC86302 | 0.365 | 14.86 | 0.584 | 0.041 | (0.18) | 0.593 | 0.59 | 3.89 | 0.069 | 0.036 | 4.67 | 0.013 | 73.99 | 0.016 | 0.73 | 50 g |
| NCS DC86301 | 0.060 | 14.86 | 0.582 | 0.019 | (0.18) | 0.513 | 0.60 | 4.10 | 0.071 | 0.030 | 4.79 | (0.012) | 73.97 | 0.015 | 0.68 | 50 g |

continued analysis listed in mg/kg

| Number | $CeO_2$ | $Dy_2O_3$ | $Er_2O_3$ | $Eu_2O_3$ | $Gd_2O_3$ | $Ho_2O_3$ | $La_2O_3$ | $Lu_2O_3$ | Mo | $Nd_2O_3$ | $Pr_6O_{11}$ | RExOy* | $Sc_2O_3$ | $Sm_2O_3$ | $Tb_4O_7$ | $Tm_2O_3$ | W | $Y_2O_3$ | $Yb_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~NCS DC86313~~ | ~~13.1~~ | ~~3.62~~ | ~~1.95~~ | ~~0.11~~ | ~~2.83~~ | ~~0.67~~ | ~~6.08~~ | ~~0.25~~ | ~~3.37~~ | ~~5.96~~ | ~~1.58~~ | ~~63.6~~ | ~~1.91~~ | ~~1.99~~ | ~~0.57~~ | ~~0.29~~ | ~~.~~ | ~~23.0~~ | ~~1.88~~ |
| NCS DC86302 | 14.8 | 4.6 | 2.2 | 0.15 | 3.8 | 0.87 | 7.7 | 0.36 | 1.2 | 7.6 | 2.0 | 78.6 | 3.1 | 2.7 | 0.80 | 0.36 | 5.5 | 28.9 | 2.5 |
| NCS DC86301 | 14.3 | 4.5 | 2.1 | 0.14 | 3.6 | 0.82 | 7.0 | 0.31 | 0.41 | 6.6 | 1.7 | 75.6 | 1.7 | 2.5 | 0.80 | 0.32 | 1.3 | 29.2 | 2.2 |

* $RE_xO_y$: Rare Earth Oxide

## BORATE ORE

# = class, 1=CRM and 2=RM analysis listed in mass % BCS: 100 g units SRM: 60 g units

| # | Number | $B_2O_3$ | $Al_2O_3$ | BaO | CaO | F | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $SO_3$ | $SiO_2$ | SrO | $TiO_2$ | $LOI+H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SRM 1835 | 18.739 | 3.474 | 0.0497 | 21.622 | 0.348 | 1.141 | 1.261 | 3.411 | 0.0333 | 3.484 | 1.477 | 18.408 | 0.9418 | 0.1332 | 25.724 |
| 2 | BCS 205a | 18.46 | 5.38 | . | 12.58 | . | 0.15 | 1.04 | 0.62 | . | 8.53 | . | 52.0 | . | 0.04 | . |

## CRM BRUCITE

T = total 50 g units

| Number | $Al_2O_3$ | CaO | $CO_2$ | $T.Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC60129 | 0.053 | 2.51 | 8.08 | 0.49 | (25.24) | 0.0041 | 61.43 | 0.036 | 0.0066 | 0.12 | 2.69 |
| NCS DC60130 | 0.067 | 6.18 | 9.95 | 0.40 | (23.22) | 0.0066 | 56.21 | 0.033 | 0.013 | 0.12 | 4.47 |

## RM CALCINED BONE

100 g

| Number | $Al_2O_3$ | BaO | CaO | F | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $SO_3$ | SrO | $TiO_2$ | LOI | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CERAM CCB1~~ | ~~0.05~~ | ~~0.031~~ | ~~53.4~~ | ~~0.13~~ | ~~0.04~~ | ~~(0.12)~~ | ~~0.011~~ | ~~1.14~~ | ~~0.52~~ | ~~40.5~~ | ~~1.28~~ | ~~0.114~~ | ~~0.049~~ | ~~<0.01~~ | ~~2.60~~ | last |

## CRM CARBONATITE

analysis listed in mass % **FOR ALTERNATES SEE LIMESTONE IN THIS CATALOG**

| Number | $Al_2O_3$ | CaO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | Ba | Ce | La | Nb | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US COQ-1~~ | ~~0.37~~ | ~~48.3~~ | ~~2.94~~ | ~~0.16~~ | ~~1.25~~ | ~~0.43~~ | ~~0.04~~ | ~~2.6~~ | ~~3.47~~ | ~~0.15~~ | ~~0.1000~~ | ~~0.1700~~ | ~~0.0750~~ | ~~0.3900~~ | ~~1.2000~~ |

## CRM CHERT

analysis listed in mass % 20 g units

| Number | $Al_2O_3$ | C | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O-$ | $H_2O+$ | $K_2O$ | MgO | MnO | Na2O | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCh-1 | 0.734 | (0.0037) | (0.055) | 0.0449 | 0.0867 | 0.272 | 0.356 | 0.152 | 0.356 | 0.221 | 0.0754 | 0.0173 | 0.0305 | 0.0167 | (0.0004) | 97.81 | 0.0316 |

continued analysis listed in mg/kg

| Number | Ag | As | Au | Ba | Be | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCh-1 | (0.0041) | 0.567 | (0.00017) | 302 | (0.373) | (0.006) | 5.21 | (14) | 15.5 | 7.04 | 0.243 | 15.3 | (0.378) | (0.233) | 0.0594 |

| Number | F | Gd | Hf | Hg | Ho | La | Li | Lu | Nb | Nd | Ni | Pb | Pd | Pr | Rb | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCh-1 | (134) | (1.7) | 0.195 | (0.00413) | (0.112) | 1.52 | (6.48) | 0.0344 | (1.7) | 2.05 | 8.76 | 2 | (0.0004) | (4.25) | 8.61 | 0.979 |

| Number | Sm | Sr | Ta | Tb | Th | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCh-1 | 0.359 | 4.2 | (0.182) | (0.0385) | 0.735 | 0.736 | 10.4 | (92.3) | 1.81 | 0.182 | 7.93 | 11.5 |

## CRM CHROME MAGNESITE

analysis listed in mass % BCS, NCS DC25x: 100 g GCR: 10 g NCS DC28x: 50 g NH: 75 g VS: 125 g

| Number | MgO | $Cr_2O_3$ | $Al_2O_3$ | $B_2O_3$ | CaO | Fe | $Fe_2O_3$ | $K_2O$ | $Li_2O$ | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BCS 396 | 64.6 | 15.6 | 5.73 | 0.09 | 1.12 | . | 10.9 | (0.03) | (0.05) | 0.17 | (0.06) | . | . | 1.37 | 0.26 | . |
| NH 95 | 63.93 | 18.30 | 3.50 | . | 1.23 | . | 6.77 | . | . | . | . | . | . | 4.05 | . | . |
| BCS 370 | 61.8 | 13.4 | 12.3 | . | 1.54 | . | 7.23 | 0.03 | 0.03 | 0.11 | 0.06 | . | . | 3.01 | 0.13 | . |
| BCS 369 | 53.5 | 17.2 | 14.7 | . | 1.17 | . | 10.3 | 0.03 | 0.03 | 0.11 | 0.05 | . | . | 2.59 | 0.14 | . |
| VS K5/2 | 54.8 | 22.6 | 4.28 | . | 1.15 | . | 8.47 | . | . | . | . | . | . | 8.64 | . | . |
| NH 96 | 46.98 | 22.37 | 12.92 | . | 1.59 | . | 11.90 | . | . | . | . | . | . | 2.71 | . | . |
| GCR-04 | 36.29 | 0.701 | 0.42 | . | 0.039 | . | 12.288 | (0.02) | . | 0.0422 | . | 0.0182 | 0.093 | 39.22 | 0.115 | 10.666 |
| NH 97 | 21.26 | 40.00 | 16.12 | . | 0.52 | . | 14.73 | . | . | . | . | . | . | 5.94 | . | . |
| NCS DC25002 | 20.59 | 36.31 | 10.97 | . | 0.82 | 9.71 | . | . | . | . | . | P:(0.0072) | S:(0.017) | 11.71 | . | 100g |
| GCR-01 | 14.59 | 44.95 | 11.31 | . | 0.052 | . | 19.63 | 0.448 | . | 0.4448 | . | (0.0098) | 0.048 | 6.63 | 0.311 | 1.286 |
| GCR-05 | 13.21 | 38.04 | 11.53 | . | 0.039 | . | 25.49 | (0.015) | . | 0.811 | . | (0.0089) | 0.018 | 7.53 | 0.258 | 2.848 |
| GCR-02 | 12.84 | 43.97 | 6.87 | . | 0.107 | . | 27.13 | (0.03) | . | 0.716 | . | (0.0071) | 0.019 | 5.83 | 0.317 | 1.883 |
| GCR-06 | 9.01 | 47.92 | 8.72 | . | 0.087 | . | 28.8 | 0.0198 | . | 0.716 | . | (0.0096) | 0.033 | 3.21 | 0.343 | 0.795 |

## CRM CHROMITE

| Number | Origin | Cr | Fe | MgO | Ti | Units |
|---|---|---|---|---|---|---|
| ~~IGS 30~~ | ~~Phillipines~~ | ~~23.95~~ | ~~11.21~~ | ~~(16.62)~~ | ~~0.14~~ | ~~55 g~~ |

## CHROMIUM ORE

# = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | $Cr_2O_3$ | $Al_2O_3$ | CaO | MgO | Fe | FeO | $Fe_2O_3$ | Mn | MnO | $Mn_3O_4$ | P | $P_2O_5$ | S | $SO_3$ | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NCS HC26617 | 96.19 | . | . | . | . | . | 0.054 | . | . | . | . | . | 0.002 | . | 0.26 | . | . |
| 1 | NCS DC73013 | 57.80 | 10.53 | (0.13) | 16.45 | . | (8.3) | 13.70T | 0.097 | . | . | (0.0012) | . | (0.005) | . | 1.10 | 0.122 | . |
| 1 | USZ 36-2002 | 54.37 | 8.24 | 0.24 | 16.09 | . | . | 14.73T | . | 0.15 | . | . | 0.02 | . | 0.07 | 4.73 | . | 0.11 |
| 1 | VS R27/1 | 50.8 | 8.08 | 0.131 | 19.7 | 9.45 | 11.2 | . | . | . | . | 0.0019 | . | 0.019 | . | 7.10 | . | . |
| 1 | VS R14/5 | 47.0 | 7.2 | 0.13 | 21.6 | 9.32 | 10.8 | . | . | . | . | 0.0017 | . | 0.037 | . | 8.79 | . | . |
| 1 | SARM 146 | 46.91 | 14.54 | 0.10 | 10.62 | . | 25.58 | . | . | 0.22 | . | . | . | . | . | 0.616 | . | 0.57 |
| 1 | NCS DC28130 | 46.74 | 14.53 | 0.053 | 9.79 | 20.34 | . | . | 0.156 | . | . | 0.0027 | . | 0.003 | . | 0.79 | 0.373 | . |
| 1 | NCS DC73012 | 46.56 | 11.60 | 0.46 | 17.92 | . | (12.0) | 15.34T | 0.135 | . | . | (0.0013) | . | 0.076 | . | 5.06 | 0.070 | . |
| 1 | BCS 308/1 | 44.91 | 15.10 | 0.65 | 9.15 | . | 26.58 | . | . | 0.230 | . | . | . | . | . | 1.194 | . | 0.74 |
| 1 | NCS DC28131 | 45.10 | 13.70 | 0.18 | 10.37 | 19.66 | . | . | 0.150 | . | . | 0.0033 | . | 0.0029 | . | 2.93 | 0.344 | . |
| 1 | SARM 131 | 41.83 | 14.60 | (0.24) | 9.15 | . | . | 30.7 | . | 0.243 | . | . | . | . | . | 3.13 | . | 0.944 |
| 1 | NCS DC28133 | 40.20 | 15.97 | 0.46 | 13.41 | 16.74 | . | . | 0.142 | . | . | 0.0037 | . | 0.017 | . | 4.73 | 0.294 | . |
| 1 | NCS DC28132 | 36.50 | 16.22 | 0.69 | 15.32 | 14.83 | . | . | 0.133 | . | . | 0.0028 | . | 0.022 | . | 7.70 | 0.244 | . |
| 1 | NCS DC73011 | 34.44 | 11.37 | 0.32 | 23.32 | . | (8.5) | 11.84T | 0.090 | . | . | 0.0020 | . | 0.024 | . | 12.24 | 0.100 | . |
| 1 | NCS DC28129 | 33.00 | 13.94 | 1.00 | 17.27 | 12.90 | . | . | 0.180 | . | . | 0.0030 | . | 0.021 | . | 12.19 | 0.136 | . |
| 1 | NCS DC28128 | 27.55 | 18.94 | 1.27 | 20.48 | 9.76 | . | . | 0.114 | . | . | 0.0029 | . | 0.035 | . | 12.55 | 0.145 | . |
| 2 | CERAM AN100 | 26.60 | 24.7 | 1.16 | 22.38 | . | . | 12.88 | . | . | 0.13 | . | . | . | . | 11.1 | . | 0.21 |
| 1 | NCS DC73010 | 17.59 | 11.86 | 0.44 | 28.12 | . | (8.68) | 10.51T | 0.088 | . | . | 0.0031 | . | 0.037 | . | 20.30 | 0.085 | . |
| 1 | FLX CRM111 | 11.48 | 4.66 | 2.07 | 70.20 | . | . | 9.54 | . | . | 0.370 | . | 0.088 | . | (0.13) | 1.40 | . | 0.160 |

continued

| Number | Au* | C | $CO_2$ | Co | $H_2O-$ | $H_2O+$ | $HfO_2$ | $K_2O$ | $Na_2O$ | Ni | NiO | V | $WO_3$ | Zn | $ZrO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS HC26617 | . | 0.006 | soluble Cr: 1.34% | | . | . | . | . | . | . | . | . | . | . | . | . | 20 g |
| NCS DC73013 | . | . | (0.14) | 0.016 | . | (0.59) | . | (0.004) | (0.016) | 0.16 | . | 0.048 | . | . | . | . | 50 g |
| USZ 36-2002 | 0.03 | . | 0.47 | 0.01 | 0.11 | . | . | . | . | 0.09 | . | 0.04 | . | 0.023 | . | 1.07 | 200 g |
| VS R27/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g |
| VS R14/5 | . | (0.113) | . | . | . | . | . | . | . | . | . | 0.044 | . | . | . | . | 100 g |
| SARM 146 | . | . | . | . | . | . | . | . | . | . | $V_2O_5$:0.32 | | . | . | . | . | 100 g |
| NCS DC28130 | . | . | . | 0.025 | . | . | . | 0.014 | . | 0.092 | . | 0.215 | . | 0.071 | . | . | 50 g |
| NCS DC73012 | . | . | (1.2) | 0.016 | . | 2.5 | . | (0.010) | 0.018 | 0.134 | . | 0.064 | . | . | . | . | 50 g |
| BCS 308/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g |
| NCS DC28131 | . | . | . | 0.025 | . | . | . | 0.015 | . | 0.094 | . | 0.207 | . | 0.065 | . | . | 50 g |
| SARM 131 | . | . | . | . | . | . | . | . | . | . | $V_2O_5$:0.414 | | . | . | . | . | 100 g |
| NCS DC28133 | . | . | . | 0.022 | . | . | . | 0.023 | . | 0.121 | . | 0.162 | . | 0.065 | . | . | 50 g |
| NCS DC28132 | . | . | . | 0.022 | . | . | . | 0.033 | . | 0.134 | . | 0.143 | . | 0.058 | . | . | 50 g |
| NCS DC73011 | . | . | (0.46) | 0.014 | . | (6.4) | . | 0.026 | 0.073 | 0.175 | . | 0.044 | . | . | . | . | 50 g |
| NCS DC28129 | . | . | . | 0.027 | . | . | . | 0.035 | . | 0.162 | . | 0.089 | . | 0.102 | . | . | 50 g |
| NCS DC28128 | . | . | . | 0.016 | . | . | . | 0.043 | . | 0.169 | . | 0.077 | . | 0.049 | . | . | 50 g |
| CERAM AN100 | . | . | . | CuO:0.02 | . | . | . | 0.01 | 0.04 | . | . | . | ZnO:0.04 | | . | (5.03) | 25 or 100 g |
| NCS DC73010 | . | . | (0.6) | 0.0124 | . | (10.7) | . | 0.046 | (0.13) | 0.188 | . | 0.043 | . | . | . | . | 50 g |
| FLX CRM111 | . | . | Co3O4: 0.012 | | . | . | <0.01 | 0.010 | <0.1 | . | 0.031 | . | <0.02 | . | 0.057 | (0.58) | 80 g |

## CRM CLAY

analysis listed in mass %

| Number | Al | B | Ba | Ca | Ce | Co | Cr | Fe | K | Li | Mg | Mn | Na | P | Si | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SRM 97b | 20.76 | . | (0.018) | 0.0249 | . | (0.00038) | 0.0227 | 0.831 | 0.513 | 0.0550 | 0.113 | 0.0047 | 0.0492 | (0.02) | 19.81 | 0.0084 |
| SRM 98b | 14.30 | . | (0.07) | 0.0759 | . | (0.00163) | 0.0119 | 1.18 | 2.81 | 0.0215 | 0.358 | 0.0116 | 0.1496 | (0.03) | 26.65 | 0.0189 |
| SRM 679 | 11.01 | . | 0.0432 | 0.1628 | (0.0105) | (0.0026) | 0.01097 | 9.05 | 2.433 | 0.00717 | 0.7552 | (0.1730) | 0.1304 | (0.075) | 24.34 | 0.00734 |

| continued | analysis listed in mass % | | | | analysis listed in mg/kg | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Ti | Zn | Zr | LOI | Cs | Eu | Hf | Rb | Sb | Sc | Th | Units |
| SRM 97b | 1.43 | (0.0087) | (0.05) | (13.3) | (3.4) | (0.84) | (13) | (33) | (2.2) | (22) | (36) | 60 g powder |
| SRM 98b | 0.809 | (0.0110) | (0.022) | (7.5) | (16.5) | (1.3) | (7.2) | (180) | (1.6) | (22) | (21) | 60 g powder |
| SRM 679 | 0.577 | (0.0150) | . | . | (9.6) | (1.9) | (4.6) | (190) | . | (22.5) | (14) | 75 g powder |

## CLAYS and FIRECLAYS

# = class, where 1 = CRM and 2 = RM analysis listed in mass %

| # | Number | $SiO_2$ | $Al_2O_3$ | CaO | Cl- | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $TiO_2$ | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NCS DC72006 | 72.73 | 14.24 | 0.89 | . | 1.97 | 0.60 | 2.57 | 0.00 | 1.90 | 0.026 | 0.29 | 0.13 | 4.65 | 1 kg | |
| 1 | NH 138 | 68.90 | 26.01 | 0.23 | . | 1.47 | 0.98 | 0.22 | . | 0.10 | . | . | 0.92 | . | 75 g | last |
| 1 | NCS DC62108d | 68.59 | 14.12 | 1.21 | . | 5.29 | 2.33 | 1.58 | . | 1.24 | . | 0.03 | 0.76 | 4.22 | 20 g | |
| 1 | NCS DC72005 | 67.63 | 17.06 | 0.99 | . | 3.36 | 1.37 | 1.99 | 0.023 | 2.40 | 0.036 | 0.024 | 0.24 | 4.72 | 1 kg | |
| 1 | GBW 03103 | 66.64 | 13.28 | 3.23 | 0.011 | 4.64 | 2.50 | 1.84 | 0.088 | 1.81 | 0.106 | 0.027 | . | 5.10 | 50 g | $CO_2$: 1.66 |
| 1 | VS K11 | 62.2 | 16.8 | 1.2 | . | (6.3) | . | 2.01 | 0.064 | . | . | S:0.05 | 0.98 | . | 50 g | |
| ~~1~~ | ~~NH 137~~ | ~~61.46~~ | ~~32.43~~ | ~~0.28~~ | ~~.~~ | ~~1.63~~ | ~~1.31~~ | ~~0.28~~ | ~~.~~ | ~~0.126~~ | ~~.~~ | ~~.~~ | ~~1.13~~ | ~~.~~ | ~~75 g~~ | |
| 1 | NCS DC72008 | 60.02 | 8.86 | 1.27 | . | 4.48 | 0.87 | 11.55 | 0.068 | 0.071 | 0.49 | . | 0.60 | 11.59 | 1 kg | CO2: 0.68 |
| 1 | NCS DC72003 | 59.71 | 18.11 | 4.34 | . | 2.64 | 0.60 | 3.51 | 0.12 | 0.37 | 0.11 | 0.060 | 0.34 | 10.08 | 1 kg | |
| 1 | NCS DC72007 | 56.29 | 10.20 | 6.00 | . | 4.41 | 1.16 | 7.11 | 0.31 | 0.16 | 0.16 | . | 0.62 | 13.32 | 1 kg | CO2: 5.17 |
| 1 | NCS DC72004 | 56.21 | 23.35 | 0.95 | . | 4.60 | 0.31 | 3.04 | 0.035 | 0.11 | 0.054 | 0.025 | 1.00 | 10.25 | 1 kg | |
| 1 | GBW 03115 | 55.90 | 28.57 | 0.70 | . | 0.87 | 1.54 | 0.30 | . | 1.74 | . | . | 1.21 | 8.72 | 50 g | |
| 1 | GBW 03102a | 53.67 | 31.32 | 1.80 | 0.0029 | 0.33 | 1.15 | 0.083 | 0.020 | 2.55 | 0.053 | 0.023 | 0.030 | 8.81 | 50 g | $CO_2$: (0.051) |
| 1 | IPT 42 | 51.9 | 32.2 | 0.05 | . | 1.09 | 0.47 | 0.19 | . | 0.02 | 0.07 | . | 0.96 | 12.9 | 50 g | |
| 1 | IPT 32 | 51.8 | 28.5 | 0.17 | . | 3.46 | 0.80 | 0.39 | . | 0.16 | 0.13 | . | 1.49 | 12.6 | 50 g | |
| 1 | BCS 348 | 51.13 | 31.59 | 0.173 | . | 1.04 | 2.23 | 0.305 | . | 0.344 | 0.071 | . | 1.08 | 11.75 | 100 g | |
| 1 | GBW 03101a | 49.98 | 26.27 | 0.13 | 0.0041 | 10.55 | 0.79 | 0.46 | 0.052 | 0.060 | 0.14 | 0.49 | 0.70 | 10.62 | 50 g | $CO_2$: (0.041) |
| 2 | FLX 134 | F: 0.0678 | Fluorine in Ball Clay, single element | | | | | | . | . | . | . | . | . | 30 g | |

## CRM CLAY - SYNTHETIC MULLITE

80 g units

| Number | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | P | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|
| ~~NCS HC14809~~ | ~~72.39~~ | ~~0.19~~ | ~~0.93~~ | ~~0.24~~ | ~~0.42~~ | ~~0.16~~ | ~~0.043~~ | ~~21.81~~ | ~~3.64~~ |
| NCS HC14808 | 57.47 | 0.15 | 0.46 | 1.69 | 0.14 | 0.46 | 0.022 | 37.41 | 1.45 |
| ~~NCS HC14807~~ | ~~43.62~~ | ~~0.23~~ | ~~1.14~~ | ~~1.62~~ | ~~0.21~~ | ~~0.46~~ | ~~0.062~~ | ~~51.43~~ | ~~0.65~~ |

## CRM COPPER ORE WITH EXTENSIVE ANALYSIS - CONTINUED ON THE NEXT PAGE

analysis listed in mass % except * which is mg/kg # = provisional analysis

| Number | Cu | Ag* | Au* | C | F | Fe | $Fe_2O_3$ | Mo | Ni | Pb | Pd* | Pt* | S | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2891-84 | 40.4 | 707.7 | . | . | . | (5.78) | . | . | . | 2.25 | . | . | (15.98) | 2.89 | . |
| CGL 203 | 31.80 | (66) | . | . | . | (21.0) | . | 0.1399 | . | 0.01366 | . | . | (33.94) | 0.1526 | . |
| CAN CCU-1F | 23.33 | 157.0 | 19.08 | (0.06) | (0.0080) | 29.50 | . | (0.00116) | (0.00192) | 0.2095 | . | . | 34.82 | 4.085 | (19.15) |
| CGL 210 | 22.24 | 47.50 | 19.92 | . | 0.0451 | 28.05 | . | 0.2219 | . | 0.0744 | . | . | 32.77 | 0.2815 | . |
| JCu-1 # | 3.73 | . | . | (3.06T) | . | . | 17.5T | . | (0.0425) | (0.0004) | . | . | (7.00) | 0.0679 | (15.37) |
| GBW 07233 | 1.15 | 3.9 | . | . | 0.079 | . | 55.58 | 0.00014 | 0.00096 | 0.00091 | . | . | 0.72 | 0.059 | . |
| CETEM CBPA-1 | 0.98 | . | (0.17) | (0.16 org) | (0.0708) | . | 16.5 | (0.0010) | 0.0276 | (0.0033) | . | . | (0.16) | 0.0126 | (3.8) |
| SRM 330a | 0.845 | . | . | . | . | (1.06) | . | (0.00045) | 0.002895 | (0.0027) | . | . | . | 0.00949 | . |
| CGL 103 | 0.8080 | 2.05 | . | . | . | 2.75 | . | 0.0160 | (0.000950) | (0.00727) | . | . | 2.12 | 0.0096 | (4.27) |
| OREAS 503e | 0.531 | 1.52 | 0.709 | (0.115) | . | 4.11 | (5.98) | 0.0343 | 0.00476 | 0.0078 | . | . | 0.875 | 0.0261 | (1.70) |
| CAN HV-2a | 0.3808 | 1.448 | . | (0.4) | . | 2.044 | . | 0.01254 | 0.000647 | 0.00069 | . | . | 0.344 | 0.00565 | (3.01) |
| GBW 07234 | 0.19 | 0.7 | . | . | 0.080 | . | 12.25 | 0.00024 | 0.00056 | 0.00130 | . | . | 0.14 | 0.013 | . |
| USZ 4-85 | 0.115 | (1.1) | . | . | . | . | 3.9T | 0.007 | (0.00165) | (0.00510) | . | . | 2.03 | (0.00680) | (4.26) |

continued analysis listed in mass %

| Number | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2891-84 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | (21.74) | . | . |
| CGL 203 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | (6) | . | . |
| CAN CCU-1F | 0.1203 | . | 0.140 | . | (0.0161) | . | 0.383 | . | 0.00829 | . | (0.02) | . | (0.0013) | . | 2.015 | (0.00528) | . |
| CGL 210 | 1.143 | . | (0.16) | . | . | . | (0.25) | . | (0.02) | . | . | . | (0.01) | . | (6.77) | (0.0700) | . |
| JCu-1 # | . | 0.29 | . | 23.5 | . | 0.015 | . | 2.13 | . | 0.59 | . | 0.052 | . | (<0.005) | (28.68) | . | 0.013 |
| GBW 07233 | . | 1.73 | . | 9.61 | . | 0.071 | . | 3.91 | . | 0.60 | . | 0.044 | . | . | 9.27 | . | 0.079 |
| CETEM CBPA-1 | . | 10.1 | . | 2.97 | . | 1.85 | . | 3.29 | 0.058 | . | . | 1.42 | . | 1.00 | (56.4) | (0.35) | . |
| SRM 330a | 7.053 | . | 0.323 | . | 5.47 | . | 0.868 | . | . | . | 0.657 | . | (0.0326) | . | Si: 33.4 | (0.1223) | . |
| CGL 103 | . | 16.19 | . | 0.285 | . | 3.71 | . | 0.69 | . | (0.0160) | . | 1.48 | . | 0.139 | 67.07 | . | 0.463 |
| OREAS 503e | 7.55 | (14.46) | 1.95 | (2.71) | 2.95 | (3.54) | 0.917 | (1.60) | 0.043 | (0.055) | 2.01 | (2.79) | 0.088 | (0.200) | (65.22) | 0.351 | (0.600) |
| CAN HV-2a | 7.96 | . | 1.891 | . | 2.31 | . | 0.329 | . | 0.0545 | . | 2.335 | . | 0.0427 | . | Si:31.34 | . | 0.128 |
| GBW 07234 | . | 15.18 | . | 4.95 | . | 2.71 | . | 1.30 | . | 0.12 | . | 3.21 | . | . | 53.36 | . | 0.50 |
| USZ 4-85 | . | . | . | . | . | (3.38) | . | . | . | . | . | (1.74) | . | (0.15) | . | . | . |

continued analysis listed in mg/kg

| Number | As | Ba | Be | Bi | Cd | Ce | Co | Cr | Cs | Dy | Er | Eu | Ga | Gd | Ge | Hf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2891-84 | . | . | . | . | 290 | . | . | . | . | . | . | . | . | . | . | . |
| CGL 203 | . | . | . | . | (9.31) | . | (86.87) | (42.97) | . | . | . | . | . | . | . | . |
| CAN CCU-1F | 821 | (7) | . | (0.649) | 110.2 | (0.80) | 304.2 | (7) | . | . | . | . | (3.39) | . | (0.8) | |
| CGL 210 | 1197 | (55.5) | . | . | (16.9) | . | (50.5) | (35.1) | . | . | (0.47) | (0.39) | . | . | . | . |
| JCu-1 # | (173) | (3.5) | . | . | (3.6) | . | (324) | (10) | . | . | . | . | . | . | . | . |
| GBW 07233 | 4.2 | . | . | 1.5 | 0.42 | 13.2 | . | (7) | . | 1.1 | 0.78 | 0.28 | 22.6 | 1.1 | 0.89 | . |
| CETEM CBPA-1 | (9) | (478) | . | . | (3) | (427) | 78 | 26 | . | . | . | . | (22.2) | . | . | . |
| SRM 330a | . | 1560 | . | . | 3.391 | 22.32 | 4.542 | 77.0 | . | . | . | . | 17.4 | . | . | . |
| CGL 103 | 167 | 958 | (1.04) | . | (0.57) | (40.35) | 12 | (18) | (2.27) | . | . | . | (18.92) | . | . | . |
| OREAS 503e | 28.8 | 926 | 2.34 | 1.86 | 0.75 | 67 | 16.3 | 45.9 | 9.33 | 3.50 | 1.44 | 1.29 | 19.4 | 5.50 | 0.18 | 1.83 |
| CAN HV-2a | 12.1 | 869 | (1.02) | (1.58) | (0.2) | 19.1 | 3.40 | 100 | 2.70 | 1.126 | 0.646 | (0.502) | 19.56 | 1.40 | . | (2) |
| GBW 07234 | 1.5 | (800) | . | 0.43 | 0.14 | 72.6 | . | (10) | (10) | 2.4 | 1.3 | 1.3 | 22.6 | 3.6 | 0.93 | . |
| USZ 4-85 | (47) | . | (4.5) | (21.7) | . | . | (12) | (22) | . | . | . | . | . | . | . | . |

| Number | Hg | Ho | In | La | Li | Lu | Nb | Nd | Pr | Rb | Re | Sb | Sc | Se | Sm | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2891-84 | . | . | . | . | . | . | . | . | . | . | 28.2 | . | . | . | . | . |
| CGL 203 | . | . | . | . | . | . | . | . | . | . | . | (400) | . | (77) | . | . |
| CAN CCU-1F | 12.19 | . | (5.71) | . | (0.4) | . | . | . | . | (0.3) | (0.005) | 85.5 | (0.5) | (211) | . | (9) |
| CGL 210 | . | (0.19) | . | (5.11) | . | . | . | . | . | . | . | (128) | . | . | (1.19) | . |
| JCu-1 # | . | . | . | . | (2.9) | . | . | . | . | (1.9) | . | (3.8) | . | . | . | . |
| GBW 07233 | . | 0.26 | 1.4 | 7.5 | (9) | 0.16 | . | 4.7 | 1.4 | . | . | 0.36 | 1.8 | 5.1 | 1 | 11.1 |
| CETEM CBPA-1 | . | . | . | (267) | . | . | (10) | (143) | . | (101) | . | . | (16) | . | (20) | (7) |
| SRM 330a | . | . | . | . | 22.19 | . | (5.7) | . | . | . | . | . | 5.693 | . | . | . |
| CGL 103 | . | . | . | (19.38) | . | . | . | . | . | (83.76) | . | 23 | . | . | . | . |
| OREAS 503e | . | 0.58 | 0.38 | 33.3 | 46.3 | 0.19 | 11.0 | 31.0 | 7.83 | 146 | 0.016 | 236 | 9.66 | 6.03 | 6.21 | 4.51 |
| CAN HV-2a | . | (0.2) | . | 9.1 | (11) | (0.109) | (2) | 8.77 | (2.32) | 48.3 | (0.1) | 0.689 | (3) | (0.7) | 1.69 | (1.2) |
| GBW 07234 | . | 0.48 | 0.25 | 40.3 | (15) | 0.2 | . | 29.4 | 8.1 | (94) | . | 0.23 | 5.4 | 0.89 | 5.1 | 3.8 |
| USZ 4-85 | . | . | . | . | . | . | . | . | . | (80) | . | . | . | (5.4) | . | . |

## CRM COPPER ORE WITH EXTENSIVE ANALYSIS - CONTINUED FROM THE PREVIOUS PAGE

analysis listed in mg/kg # = provisional analysis OREAS samples list multiple methods, more information upon request

| Number | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zr | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2891-84 | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| CGL 203 | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 or 250 g | |
| CAN CCU-1F | (2) | 49.9 | . | . | . | 1.51 | . | (0.4) | (3) | (1.12) | (0.8) | . | . | 200 g | $H_2O$%:(0.96) |
| CGL 210 | . | . | . | . | . | . | . | (0.29) | . | . | . | . | . | 200 g | |
| JCu-1 # | (75) | . | . | . | . | . | . | . | (9) | . | . | . | . | 100 g | $H_2O$%:(0.54-, 1.00+) |
| GBW 07233 | . | . | 0.21 | 0.62 | 0.9 | 0.06 | 0.11 | . | . | 4.1 | 7.3 | 0.28 | . | 50 g | |
| CETEM CBPA-1 | (67) | (5) | . | . | (25) | . | . | (41) | (168) | . | (69) | . | (149) | 135 g | |
| SRM 330a | 218.1 | . | . | . | (7.6) | . | . | . | (43) | . | 20.01 | . | 80.5 | 90 g | |
| CGL 103 | 181 | . | . | . | . | . | . | (0.96) | (59.43) | (13.55) | . | . | (102.76) | 100 g | |
| OREAS 503e | 229 | 0.97 | 0.69 | 0.85 | 12.3 | 0.82 | 0.20 | 3.47 | 79 | 10.6 | 14.9 | 1.18 | 57 | 10g 60g or 1kg | $SO_3$:(2.18) |
| CAN HV-2a | 472 | (0.2) | (0.19) | . | 1.28 | (0.1) | (0.10) | 1.08 | (52.2) | (7.89) | (5.96) | (0.680) | (65.8) | 200 g | $H_2O$%:(0.3) |
| GBW 07234 | . | . | 0.48 | 0.13 | 8.8 | 0.36 | 0.18 | . | . | 3.9 | 11.8 | 1.2 | . | 50 g | |
| USZ 4-85 | . | . | . | (6.8) | . | . | . | . | . | (16) | . | . | (149) | 100 g | |

## CRM COPPER ORE

analysis listed in mass % F = Sodium Peroxide Fusion ICP A = Four Fcid Digestion ICP-OES/MS values 10 g

| Number | Cu | Ag | $Al_2O_3$ | As | CaO | Cd | Co | Fe | MgO | Pb | S | Sb | $SiO_2$ | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 113 4 | 13.5 | 0.00226 | . | 0.0234 | . | 0.00155 | 0.0766 | 28.2 | . | 0.0230 | . | 0.0008 | . | 0.4178 |
| OREAS 113 F | 13.3 | (0.0025) | . | 0.0238 | . | (0.0016) | 0.0754 | 28.0 | . | 0.0248 | . | 0.00076 | . | 0.4158 |
| OREAS 166 4 | 8.82 | 0.00108 | 1.38 | . | 0.98 | . | 0.1970 | 11.38 | 1.67 | 0.0140 | 11.6 | . | . | 0.0037 |
| OREAS 166 F | 8.75 | 0.0012 | 1.34 | . | 0.98 | . | 0.2077 | 11.45 | 1.67 | 0.0128 | 11.29 | . | 61.4 | 0.0037 |
| OREAS 112 F | 5.13 | 0.0017 | . | 0.0240 | . | 0.0015 | 0.0547 | 33.3 | . | 0.0349 | . | 0.0017 | . | 0.4302 |
| OREAS 112 4 | 5.10 | 0.00132 | . | 0.0222 | . | 0.00146 | 0.0551 | 34.1 | . | 0.0360 | . | 0.0016 | . | 0.4351 |
| OREAS 165 F | 3.21 | 0.00031 | 2.61 | . | 0.11 | . | 0.2485 | 8.86 | 3.48 | 0.0434 | 8.28 | . | 72.0 | 0.0044 |
| OREAS 165 4 | 3.20 | 0.000302 | 2.59 | . | 0.081 | . | 0.2445 | 8.86 | 3.53 | 0.0443 | 8.5 | . | . | 0.0037 |
| OREAS 111b 4 | 2.47 | 0.00101 | . | 0.0220 | . | 0.00143 | 0.0490 | 36.1 | . | 0.0393 | . | 0.0021 | . | 0.4334 |
| OREAS 111b F | 2.44 | <0.0020 | . | 0.0212 | . | 0.00148 | 0.0488 | 35.5 | . | 0.0397 | . | 0.0019 | . | 0.4370 |
| OREAS 164 4 | 2.25 | 0.000294 | 2.07 | . | 0.393 | . | 0.0168 | 6.80 | 3.07 | 0.0214 | 6.2 | . | . | 0.0045 |
| OREAS 164 F | 2.22 | <0.0005 | 2.05 | . | 0.401 | . | 0.0167 | 6.88 | 3.07 | 0.0199 | 5.98 | . | 77.9 | 0.0047 |
| OREAS 163 4 | 1.76 | 0.00043 | 3.24 | . | 0.860 | . | 0.0230 | 11.07 | 5.42 | 0.0492 | 10.4 | . | . | 0.0108 |
| OREAS 163 F | 1.71 | 0.0005 | 3.16 | . | 0.92 | . | 0.0230 | 11.1 | 5.34 | 0.0461 | 9.98 | . | . | 0.0102 |
| OREAS 162 4 | 0.772 | 0.00035 | 1.70 | . | 13.2 | . | 0.0631 | 8.57 | 9.17 | 0.0340 | 4.38 | . | . | 0.0026 |
| OREAS 162 F | 0.761 | 0.000358 | 1.64 | . | 13.1 | . | 0.0660 | 8.63 | 9.04 | 0.0320 | 4.40 | . | . | 0.002755 |
| Number | Cu | Ag | $Al_2O_3$ | As | CaO | Cd | Co | Fe | MgO | Pb | S | Sb | $SiO_2$ | Zn |

## CRM COPPER ORE

analysis listed in mass % except * which is mg/kg 50 g units

| Number | Cu | $Al_2O_3$ | As | CaO | F | Fe | Pb | S | $SiO_2$ | Sn | Zn | Ag | Au* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28188 | 31.05 | 0.72 | 0.024 | 4.54 | 0.012 | 22.19 | 0.15 | 24.52 | 8.17 | . | 0.075 | 0.0330 | 9 |
| NCS DC11058 | 26.96 | 0.170 | 0.71 | 0.073 | 0.050 | 27.72 | 1.53 | 33.29 | 0.55 | 1.02 | 5.77 | 0.144 | 0.65 |
| NCS DC28192 | 24.40 | 0.71 | 0.013 | 2.1 | 0.012 | 28.46 | 0.097 | 31.22 | 5.28 | . | 0.20 | 0.0181 | 12 |
| NCS DC11059 | 23.92 | 1.12 | 1.56 | 0.37 | 0.36 | 25.84 | 1.35 | 30.09 | 6.28 | 0.90 | 5.05 | 0.126 | 0.61 |
| NCS DC28187 | 22.50 | 0.27 | 0.007 | 0.56 | 0.012 | 31.37 | 0.011 | 33.81 | 3.72 | . | 0.45 | 0.0021 | 15 |
| NCS DC11060 | 20.67 | 2.06 | 2.36 | 0.63 | 0.63 | 23.82 | 1.21 | 26.54 | 11.27 | 0.78 | 4.40 | 0.111 | 0.58 |
| NCS DC28191 | 20.12 | 0.49 | 0.007 | 1.41 | 0.028 | 26.02 | 0.012 | 24.62 | 12.53 | . | 0.50 | 0.0017 | 10 |
| NCS DC11061 | 18.63 | 2.61 | 2.79 | 0.81 | 0.80 | 22.65 | 1.04 | 24.23 | 14.60 | 0.69 | 3.89 | 0.095 | 0.51 |
| NCS DC28190 | 16.92 | 1.32 | 0.011 | 0.38 | 0.012 | 34.12 | 0.13 | 38.00 | 3.73 | . | 0.034 | 0.0186 | 10 |
| NCS DC11062 | 14.37 | 3.90 | 3.89 | 1.20 | 1.17 | 20.63 | 0.83 | 20.73 | 22.03 | 0.56 | 3.17 | 0.076 | 0.49 |
| NCS DC11063 | 12.16 | 4.43 | 4.43 | 1.36 | 1.36 | 19.23 | 0.70 | 18.30 | 25.58 | 0.47 | 2.73 | 0.064 | 0.43 |
| NCS DC28189 | 9.88 | 5.11 | 0.018 | 1.93 | 0.044 | 25.18 | 0.26 | 24.91 | 14.03 | . | 0.069 | 0.0141 | 9 |
| NCS DC11064 | 9.59 | 5.40 | 5.55 | 1.66 | 1.57 | 18.65 | 0.57 | 16.44 | 30.35 | 0.37 | 2.24 | 0.051 | 0.42 |

continued analysis

| Number | Bi | Cd | Co | Ge* | Hg* | $K_2O$ | MgO | Mn | $Na_2O$ | Ni | Sb | Se |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28188 | 0.11 | 0.001 | 0.012 | . | (1.4) | 0.081 | 1.04 | 0.027 | 0.054 | 0.008 | 0.003 | . |
| NCS DC11058 | 0.072 | 0.033 | 0.0006 | (1) | (0.6) | 0.045 | 0.031 | 0.0099 | 0.011 | . | 0.12 | 0.0014 |
| NCS DC28192 | 0.052 | 0.0005 | 0.096 | . | (1.3) | 0.13 | 1.27 | 0.032 | 0.036 | 0.074 | 0.0015 | . |
| NCS DC11059 | 0.072 | 0.029 | 0.00162 | (1) | (0.4) | 0.42 | 0.187 | 0.0137 | 0.068 | . | 0.108 | 0.0012 |
| NCS DC28187 | 0.0004 | 0.0003 | 0.24 | . | (0.3) | 0.015 | 2.05 | 0.013 | 0.008 | 0.19 | 0.0006 | . |
| NCS DC11060 | 0.056 | 0.025 | 0.0024 | (1) | (0.4) | 0.76 | 0.327 | 0.0179 | 0.13 | . | 0.096 | 0.0012 |
| NCS DC28191 | 0.0003 | 0.0002 | 0.14 | . | (0.3) | 0.037 | 6.40 | 0.023 | 0.025 | 0.13 | (0.0003) | . |
| NCS DC11061 | 0.049 | 0.023 | 0.0030 | (0.8) | 0.32 | 0.95 | 0.427 | 0.021 | 0.16 | . | 0.084 | 0.0011 |
| NCS DC28190 | 0.061 | 0.0002 | 0.013 | . | (0.1) | 0.38 | 0.46 | 0.068 | 0.045 | 0.009 | 0.0005 | . |
| NCS DC11062 | 0.041 | 0.018 | 0.0042 | (0.8) | (0.3) | 1.43 | 0.64 | 0.027 | 0.24 | . | 0.070 | 0.0010 |
| NCS DC11063 | 0.037 | 0.016 | 0.0050 | (0.9) | (0.3) | 1.62 | 0.73 | 0.029 | 0.27 | . | 0.061 | (0.0007) |
| NCS DC28189 | 0.038 | 0.0005 | 0.008 | . | (0.2) | 1.44 | 0.77 | 0.14 | 0.19 | 0.006 | 0.003 | . |
| NCS DC11064 | 0.030 | 0.014 | 0.0063 | (1.0) | (0.4) | 1.97 | 0.88 | 0.035 | 0.34 | . | 0.049 | (0.0007) |

## CRM COPPER ORE - EXTENSIVE ANALYSIS NOT SHOWN

analysis listed in mass % except * which is mg/kg — 10g, 60g, or 1 kg

| Number | Cu | Ag* | Au* | Bi | Co | Ni | Pb | Rb | Se | Sn | Zn | Zr | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 98 4 | 14.8 | 45.1 | . | 0.00972 | 0.0121 | (0.00353) | 0.0345 | (0.00817) | 0.0158 | 0.0206 | 0.1355 | (0.00667) | |
| OREAS 98 A | 14.7 | 42.8 | . | 0.00928 | 0.0111 | . | 0.0343 | . | 0.0143 | 0.0171 | 0.1302 | . | |
| OREAS 935 I | 12.43 | 43.73 | . | 0.0679 | 0.0085 | (0.0156) | 0.0233 | (0.0089) | 0.0105 | 0.0119 | 0.0721 | (0.0074) | |
| OREAS 935 4 | 12.55 | 43.87 | (<0.1) | 0.0709 | 0.0077 | 0.00297 | 0.0225 | (0.0080) | 0.0088 | 0.0108 | 0.0692 | 0.00474 | |
| OREAS 935 A | 12.48 | 43.67 | (0.04) | 0.0680 | 0.0077 | 0.00262 | 0.0222 | (0.00136) | 0.0086 | 0.0096 | 0.0666 | (0.00133) | |
| OREAS 935 F | 12.54 | . | . | . | <0.0100 | (0.00158) | (0.0255) | . | . | (0.0138) | 0.0688 | (0.0050) | |
| OREAS 934 I | 9.50 | 34.67 | . | 0.0517 | 0.0075 | (0.00320) | 0.0262 | (0.0106) | 0.0096 | 0.0095 | 0.0744 | (0.0093) | |
| OREAS 934 4 | 9.59 | 36.46 | (<0.1) | 0.0527 | 0.0071 | 0.00282 | 0.0240 | (0.0097) | 0.0085 | 0.0083 | 0.0724 | 0.0058 | |
| OREAS 934 A | 9.58 | 34.40 | (0.022) | 0.0515 | 0.0067 | 0.00257 | 0.0242 | (0.00145) | 0.0080 | 0.0076 | 0.0692 | (0.00162) | |
| OREAS 934 F | 9.51 | . | . | . | <0.0100 | (0.000917) | 0.0242 | . | . | (0.0116) | 0.0718 | (0.0073) | |
| OREAS 933 I | 8.34 | 29.32 | . | 0.0466 | 0.0063 | (0.0108) | 0.0197 | (0.0103) | 0.0079 | 0.0086 | 0.0617 | (0.0101) | |
| OREAS 933 4 | 8.37 | 31.05 | (<0.1) | 0.0451 | 0.0060 | 0.00281 | 0.0189 | (0.0095) | 0.0068 | 0.0073 | 0.0602 | 0.0063 | |
| OREAS 933 A | 8.27 | 29.62 | (0.027) | 0.0449 | 0.0061 | 0.00281 | 0.0187 | (0.00126) | 0.0066 | 0.0066 | 0.0596 | (0.00164) | |
| OREAS 933 F | 8.38 | . | . | . | <0.0100 | (0.000800) | 0.0210 | . | . | (0.0106) | 0.0606 | (0.0090) | |
| OREAS 97 4 | 6.31 | 19.6 | . | 0.00401 | 0.00629 | (0.00370) | 0.0147 | (0.0126) | 0.00714 | 0.00957 | 0.0646 | (0.00965) | |
| OREAS 97 A | 6.28 | 19.5 | . | 0.00403 | 0.00625 | . | 0.0142 | . | 0.00673 | 0.00838 | 0.0635 | . | |
| OREAS 932 I | 6.17 | 23.00 | . | 0.0337 | 0.0062 | (0.00303) | 0.0195 | (0.0122) | 0.0073 | 0.0067 | 0.0590 | (0.0114) | |
| OREAS 932 4 | 6.13 | 22.41 | (<0.1) | 0.0324 | 0.0060 | 0.00274 | 0.0184 | (0.0112) | 0.0067 | 0.0058 | 0.0591 | 0.0073 | |
| OREAS 932 A | 6.11 | 21.96 | (0.012) | 0.0322 | 0.0061 | 0.00282 | 0.0182 | (0.00162) | 0.0063 | 0.0051 | 0.0579 | (0.00191) | |
| OREAS 932 F | 6.19 | . | . | . | <0.0100 | (0.00133) | 0.0200 | . | . | (0.0092) | 0.0599 | (0.0093) | |
| OREAS 96 4 | 3.93 | 11.5 | . | 0.00263 | 0.00499 | (0.00393) | 0.0101 | (0.0141) | 0.00407 | 0.00656 | 0.0457 | (0.0109) | last |
| OREAS 96 A | 3.91 | 11.5 | . | 0.00279 | 0.00492 | . | 0.0100 | . | 0.00410 | 0.00528 | 0.0448 | . | |
| ~~OREAS 931 I~~ | ~~3.83~~ | ~~13.62~~ | ~~.~~ | ~~0.0205~~ | ~~0.00466~~ | ~~(0.00362)~~ | ~~0.0155~~ | ~~(0.0134)~~ | ~~0.0050~~ | ~~<0.0060~~ | ~~0.0490~~ | ~~(0.0132)~~ | |
| ~~OREAS 931 4~~ | ~~3.82~~ | ~~14.04~~ | ~~(<0.1)~~ | ~~0.0204~~ | ~~0.00469~~ | ~~0.00288~~ | ~~0.0147~~ | ~~(0.0128)~~ | ~~0.00435~~ | ~~0.00421~~ | ~~0.0480~~ | ~~(0.0085)~~ | |
| ~~OREAS 931 A~~ | ~~3.81~~ | ~~14.18~~ | ~~(0.006)~~ | ~~0.0206~~ | ~~0.00453~~ | ~~0.00287~~ | ~~0.0146~~ | ~~(0.00153)~~ | ~~0.00422~~ | ~~0.00330~~ | ~~0.0472~~ | ~~(0.00199)~~ | |
| ~~OREAS 931 F~~ | ~~3.82~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~<0.0050~~ | ~~(<0.0010)~~ | ~~(0.0159)~~ | ~~.~~ | ~~.~~ | ~~(0.0064)~~ | ~~0.0495~~ | ~~(0.0097)~~ | |
| OREAS 930 I | 2.51 | 8.63 | . | 0.0138 | 0.00391 | (<0.0050) | <0.0150 | (0.0150) | 0.00336 | 0.00351 | 0.0499 | (0.0147) | |
| OREAS 930 4 | 2.52 | 9.00 | (<0.1) | 0.0136 | 0.00374 | 0.00311 | 0.0141 | (0.0136) | 0.00301 | 0.00311 | 0.0492 | 0.0089 | |
| OREAS 930 A | 2.51 | 9.13 | (0.004) | 0.0139 | 0.00364 | 0.00306 | 0.0142 | (0.00181) | 0.00286 | 0.00234 | 0.0488 | (0.00220) | |
| OREAS 930 F | 2.51 | . | . | . | <0.0100 | (0.00217) | <0.0160 | . | . | (0.0059) | 0.0504 | (0.0112) | |
| OREAS 929 I | 2.00 | <8 | . | 0.0114 | 0.00362 | (<0.0020) | 0.0116 | (0.0141) | 0.00243 | 0.00311 | 0.0492 | (0.0141) | |
| OREAS 929 4 | 2.00 | 7.18 | (<0.1) | 0.0111 | 0.00336 | 0.00307 | 0.0130 | (0.0129) | 0.00241 | 0.00291 | 0.0477 | 0.0088 | |
| OREAS 929 A | 2.02 | 7.03 | (0.004) | 0.0114 | 0.00336 | 0.00297 | 0.0131 | (0.00175) | 0.00240 | 0.00201 | 0.0468 | (0.00211) | |
| OREAS 929 F | 2.02 | . | . | . | (<0.0100) | (0.00275) | 0.0143 | . | . | (0.00458) | 0.0486 | (0.0127) | |

| Number | Cu | Ag* | Au* | Bi | Co | Ni | Pb | Rb | Se | Sn | Zn | Zr | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~OREAS 928 I~~ | ~~1.52~~ | ~~<8~~ | ~~.~~ | ~~0.0083~~ | ~~0.00335~~ | ~~(0.00376)~~ | ~~0.0112~~ | ~~(0.0127)~~ | ~~<0.0020~~ | ~~0.00278~~ | ~~0.0432~~ | ~~(0.0141)~~ | |
| ~~OREAS 928 4~~ | ~~1.53~~ | ~~5.39~~ | ~~(<0.100)~~ | ~~0.0079~~ | ~~0.00313~~ | ~~0.00296~~ | ~~0.0122~~ | ~~(0.0116)~~ | ~~0.00188~~ | ~~0.00262~~ | ~~0.0436~~ | ~~(0.0094)~~ | |
| ~~OREAS 928 A~~ | ~~1.52~~ | ~~5.11~~ | ~~(0.006)~~ | ~~0.0080~~ | ~~0.00306~~ | ~~0.00281~~ | ~~0.0122~~ | ~~(0.00148)~~ | ~~0.00179~~ | ~~0.00157~~ | ~~0.0429~~ | ~~(0.00199)~~ | |
| ~~OREAS 928 F~~ | ~~1.52~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~<0.0050~~ | ~~(0.00208)~~ | ~~(0.0133)~~ | ~~.~~ | ~~.~~ | ~~(0.00300)~~ | ~~0.0435~~ | ~~(0.0108)~~ | |
| OREAS 504b 4 | 1.11 | 3.07 | 1.61 | 0.000492 | 0.00209 | 0.00345 | 0.00262 | 0.0106 | 0.00124 | 0.00114 | 0.0108 | 0.0060 | last |
| OREAS 504b A | 1.10 | 2.98 | 1.56 | 0.000513 | 0.00187 | 0.00300 | 0.00201 | 0.0051 | 0.00116 | 0.00104 | 0.0096 | 0.00142 | last |
| ~~OREAS 927 I~~ | ~~1.09~~ | ~~.~~ | ~~.~~ | ~~0.0062~~ | ~~0.00310~~ | ~~0.00302~~ | ~~0.0214~~ | ~~0.0122~~ | ~~.~~ | ~~0.00238~~ | ~~0.0750~~ | ~~.~~ | |
| ~~OREAS 927 4~~ | ~~1.08~~ | ~~4.08~~ | ~~.~~ | ~~0.0057~~ | ~~0.00287~~ | ~~0.00297~~ | ~~0.0209~~ | ~~0.0119~~ | ~~0.00157~~ | ~~0.00207~~ | ~~0.0716~~ | ~~0.0097~~ | |
| ~~OREAS 927 A~~ | ~~1.06~~ | ~~3.90~~ | ~~<0.010~~ | ~~0.0059~~ | ~~0.00286~~ | ~~0.00280~~ | ~~0.0203~~ | ~~0.00147~~ | ~~0.00153~~ | ~~0.00122~~ | ~~0.0717~~ | ~~0.00201~~ | |
| ~~OREAS 903 4 **~~ | ~~0.652~~ | ~~0.432~~ | ~~(<0.050)~~ | ~~0.00089~~ | ~~0.0131~~ | ~~0.0054~~ | ~~0.00113~~ | ~~0.0137~~ | ~~0.000606~~ | ~~0.000263~~ | ~~0.00243~~ | ~~0.0152~~ | |
| ~~OREAS 903 A~~ | ~~0.671~~ | ~~0.349~~ | ~~(<0.005)~~ | ~~0.00088~~ | ~~0.0131~~ | ~~0.00487~~ | ~~0.000895~~ | ~~0.00126~~ | ~~0.000534~~ | ~~(0.00004)~~ | ~~0.00213~~ | ~~0.00182~~ | |
| OREAS 925 I | 0.621 | . | . | 0.00336 | 0.00254 | 0.00355 | 0.0115 | 0.0166 | . | 0.00179 | 0.0459 | . | |
| OREAS 925 4 | 0.615 | 2.36 | . | 0.00313 | 0.00246 | 0.00348 | 0.0110 | 0.0163 | 0.000907 | 0.00149 | 0.0446 | 0.0106 | |
| OREAS 925 A | 0.629 | 2.41 | <0.005 | 0.00324 | 0.00238 | 0.00317 | 0.0111 | 0.00189 | 0.000891 | 0.000777 | 0.0437 | 0.00218 | |
| ~~OREAS 503b~~ | ~~0.531~~ | ~~1.54~~ | ~~0.695~~ | ~~0.000261~~ | ~~0.00171~~ | ~~0.00387~~ | ~~0.00243~~ | ~~0.0163~~ | ~~0.000661~~ | ~~0.000752~~ | ~~0.0092~~ | ~~0.0071~~ | ~~last~~ |
| OREAS 924 I | 0.520 | . | . | 0.00293 | 0.00244 | 0.00385 | 0.0096 | 0.0173 | . | 0.00167 | 0.0389 | . | |
| OREAS 924 4 | 0.512 | 1.99 | . | 0.00273 | 0.00234 | 0.00360 | 0.0092 | 0.0172 | 0.000786 | 0.00136 | 0.0380 | 0.0109 | |
| OREAS 924 A | 0.516 | 1.92 | <0.005 | 0.00257 | 0.00227 | 0.00326 | 0.0092 | 0.00203 | 0.000732 | 0.000672 | 0.0370 | 0.00222 | |
| OREAS 923 I | 0.4328 | . | . | 0.00212 | 0.00239 | 0.00407 | 0.0086 | 0.0169 | . | 0.00161 | 0.0358 | . | |
| OREAS 923 4 | 0.4230 | 1.60 | . | 0.00214 | 0.00231 | 0.00358 | 0.0083 | 0.0166 | 0.000654 | 0.00133 | 0.0345 | 0.0116 | |
| OREAS 923 A | 0.4248 | 1.62 | <0.005 | 0.00218 | 0.00222 | 0.00327 | 0.0081 | 0.00196 | 0.000599 | 0.000599 | 0.0335 | 0.00225 | |
| OREAS 501c | 0.276 | 0.461 | 0.221 | 0.000069 | 0.00151 | 0.0060 | 0.00215 | 0.0196 | 0.000207 | 0.000338 | 0.0081 | 0.0081 | |
| OREAS 922 I | 0.2215 | . | . | 0.00108 | 0.00209 | 0.00434 | 0.0064 | 0.0167 | . | 0.00100 | 0.0277 | . | |
| OREAS 922 4 | 0.2122 | 0.888 | . | 0.00101 | 0.00204 | 0.00379 | 0.0059 | 0.0164 | 0.000376 | 0.000995 | 0.0267 | 0.0127 | |
| OREAS 922 A | 0.2176 | 0.851 | <0.005 | 0.00103 | 0.00194 | 0.00343 | 0.0060 | 0.00227 | 0.000344 | 0.000383 | 0.0256 | 0.00223 | |
| OREAS 921 I | 0.0293 | . | . | <0.0002 | 0.00173 | 0.00419 | 0.00271 | 0.0178 | . | <0.0010 | 0.0139 | . | last |
| OREAS 921 4 | 0.0274 | 0.152 | . | 0.000120 | 0.00165 | 0.00411 | 0.00280 | 0.0176 | <0.0002 | 0.000582 | 0.0132 | 0.0147 | |
| OREAS 921 A | 0.0278 | 0.164 | <0.005 | 0.000125 | 0.00155 | 0.00380 | 0.00260 | 0.00242 | 0.000104 | 0.000145 | 0.0124 | 0.00214 | |
| OREAS 501b 4 | 0.260 | 0.778 | 0.248 | 0.000154 | 0.00158 | 0.00415 | 0.00230 | 0.0184 | (0.000363) | 0.000558 | 0.0089 | 0.0077 | |
| OREAS 501b A | 0.258 | 0.721 | 0.243 | 0.000160 | 0.00149 | 0.00375 | 0.000942 | 0.0126 | 0.000278 | 0.000465 | 0.0080 | 0.00109 | |

| Number | Cu | Ag* | Au* | Bi | Co | Ni | Pb | Rb | Se | Sn | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

** OREAS 903 also certifies Cu at 0.434% using acid leach

These samples also detail up to 74 additional elements, certificates available upon request.
Each sample is certified for a variety of methods: 4 = 4 ACID DIGESTION, A = AQUA REGIA, F = FUSION, I = ICP

## COPPER ORE

# = class, where 1=CRM and 2=RM; analysis in mass % except * = mg/kg; GBM: 10 or 250g NCS: 50g VS: 100g

| # | Number | Cu | Ag* | As | Ni | Pb | Tot.S | Zn | Au* | Bi* | Co* | Cd* | Fe | Hg* | Mo* | Sb* | $SiO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IMN Ko-P2 | 26.10 | 458.7 | 0.138 | 1.16 | . | . | . | . | . | . | . | . | . | . | . | . | 250 g units |
| 1 | GBM922-16 | 24.6093 | 326.3 | . | 0.0805 | 0.7508 | 26.31 | 1.2224 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM313-16 | 24.2702 | 109.3 | . | 0.0153 | 0.0035 | 3.64 | 0.0043 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM316-12 | 23.8210 | 86.0 | . | 0.0009 | 0.0236 | 25.43 | 0.0480 | . | . | . | . | . | . | . | . | . | |
| 1 | IMN W5 | 22.95 | 392 | 0.117 | . | 1.38 | . | C:10.71 | Org.C:7.91 | | . | . | . | . | . | . | . | 100 g units |
| 1 | GBM913-14 | 22.7577 | 200.3 | . | 0.0053 | 0.0029 | 6.22 | 0.0107 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM314-15 | 21.2876 | 176.2 | . | 0.0037 | 0.0145 | 6.54 | 0.02 | . | . | . | . | . | . | . | . | . | |
| 1 | OREAS 991 | 20.66 | 48.14 | (0.0170) | (0.00320) | (0.0123) | (30.77) | . | 47.04 | (<50) | (122) | . | (26.92) | . | (490) | . | . | 50 g units |
| 1 | GBM319-12 | 19.5549 | 112.9 | . | 0.2069 | 0.2128 | 13.42 | 0.8434 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM319-11 | 18.0603 | 108.0 | . | 0.0914 | 1.1393 | 22.96 | 1.5795 | . | . | . | . | . | . | . | . | . | |
| 1 | VS R34/1 | 17.21 | 81 | 0.35 | . | 0.17 | 38.6 | 2.45 | 4.7 | 60 | . | 32.9 | . | . | 97 | 680 | 1.92 | |
| 1 | GBM905-14 | 17.3667 | . | . | 0.0531 | 0.0334 | . | 0.0074 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM908-11 | 17.7033 | 11.4 | . | . | 0.0547 | 29.78 | 2.3604 | . | . | . | . | . | . | . | . | . | last |
| 1 | GBM314-16 | 16.0964 | 89.4 | . | 0.0661 | 0.0884 | 22.79 | 0.2898 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM323-16 | 15.7320 | 220.6 | . | 0.3131 | 0.4159 | 23.85 | 3.4195 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM913-13 | 12.1059 | 74.1 | . | 0.0084 | 0.0125 | 2.43 | 0.0386 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM317-13 | 10.3409 | 19.0 | . | 3.9436 | 0.7361 | 15.52 | 2.4779 | . | . | . | . | . | . | . | . | . | |
| 1 | NCS DC29110 | 8.53 | 120 | 0.020 | . | 0.027 | (15.42) | 0.19 | . | . | . | 13.5 | . | (0.039) | . | 35.3 | . | |
| 1 | GBM319-16 | 6.9993 | 8.8 | . | 0.0055 | 0.0012 | 0.04 | 0.0023 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM319-8 | 6.9613 | 8.8 | 0.0115 | 0.0057 | 0.0005 | . | 0.0023 | . | . | 53 | . | . | . | . | . | . | |
| 1 | GBM321-16 | 6.9389 | 22.0 | . | 0.0065 | 0.0677 | 7.47 | 0.1007 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM319-7 | 4.3368 | 51.8 | 0.1241 | 0.0008 | 0.0061 | . | 0.0669 | . | . | 45 | . | . | . | . | . | . | |
| 1 | GBM319-15 | 4.3324 | 51.3 | . | 0.0009 | 0.0069 | 0.07 | 0.0681 | . | . | . | . | . | . | . | . | . | |
| 1 | NCS DC29109 | 3.84 | 59.9 | 0.046 | . | 0.024 | (8.58) | 0.083 | . | . | . | 5.68 | . | (0.043) | . | 71 | . | |
| 1 | GBM916-14 | 3.6746 | 26.8 | . | 0.0023 | 0.0515 | 23.66 | 0.7103 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM905-11 | 3.1758 | . | . | 0.0038 | 0.0042 | . | 0.0084 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM319-14 | 2.9546 | 36.4 | . | 0.0299 | 0.7331 | 4.92 | 2.2491 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM903-13 | 2.9077 | 23.9 | . | 2.4567 | 2.1559 | 2.42 | 0.9340 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM922-14 | 2.8331 | 8.9 | . | 0.0041 | 0.0165 | 3.51 | 0.0949 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM916-12 | 2.6105 | 17.0 | . | 0.0023 | 0.0566 | 19.10 | 0.5018 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM318-4 | 2.4208 | 20.5 | 0.0545 | 0.0077 | 0.0023 | . | 0.0407 | . | . | 40 | . | . | . | . | . | . | |
| 1 | GBM322-12 | 2.4118 | 19.8 | . | 0.0077 | 0.0024 | 0.03 | 0.0413 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM316-11 | 2.2288 | 21.7 | . | 0.0021 | 0.1065 | 18.11 | 1.0133 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM905-12 | 2.1853 | . | . | 0.0062 | 0.0033 | . | 0.0100 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM323-11 | 2.2045 | 42.2 | . | 0.0055 | 0.0799 | 2.65 | 0.0909 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM920-10 | 2.1707 | 41.9 | 0.0083 | 0.0057 | 0.0779 | . | 0.0890 | . | . | 94 | . | . | . | . | . | . | |
| 1 | GBM921-11 | 2.1510 | 15.6 | . | 0.0019 | 0.1469 | 1.22 | 0.2519 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM916-13 | 2.0136 | 12.5 | . | 0.0023 | 0.0390 | 17.60 | 0.3795 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM319-13 | 1.5964 | 7.4 | . | 0.0075 | 0.0066 | 2.18 | 0.0454 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM319-1 | 1.5759 | 7.2 | 0.0052 | 0.0080 | 0.0061 | . | 0.0450 | . | . | 73 | . | . | . | . | . | . | |
| 1 | GBM920-12 | 1.5542 | 5.3 | . | 0.0269 | 0.0053 | 21.84 | 0.0107 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM920-2 | 1.5495 | 5.4 | 0.1607 | 0.0270 | 0.0038 | . | 0.0104 | . | . | 567 | . | . | . | . | . | . | |
| 1 | GBM920-13 | 1.5481 | 5.4 | . | 0.0284 | 0.0046 | 23.50 | 0.0110 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM920-3 | 1.5471 | 5.3 | 0.1688 | 0.0283 | 0.0038 | . | 0.0103 | . | . | 594 | . | . | . | . | . | . | |
| 1 | GBM915-4 | 1.1835 | 25.7 | 0.0663 | 0.0118 | 0.4921 | . | 1.0035 | . | . | 69 | . | . | . | . | . | . | |
| 1 | VS R35 | 1.65 | 17.4 | 0.067 | . | 0.036 | 26.7 | 0.74 | 1.23 | . | . | . | . | . | . | . | 35.2 | |
| 2 | IMN MR2 | 1.61 | 29 | 0.013 | . | 0.085 | . | 0.025 | . | . | . | . | 0.88 | . | . | . | . | 200 g units |
| 1 | GBM322-13 | 1.3016 | 4.1 | . | 0.0210 | 0.0098 | 6.32 | 0.0613 | . | . | . | . | . | . | . | . | . | |
| 2 | IMN MR1 | 1.23 | 58 | 0.028 | . | 0.15 | . | 0.040 | . | . | . | . | 1.41 | . | . | last | . | 200 g units |
| 1 | GBM321-12 | 1.1883 | 26.0 | . | 0.0113 | 0.4967 | 2.06 | 1.0128 | . | . | . | . | . | . | . | . | . | |
| 1 | GBM910-6 | 1.0084 | 3.6 | 0.0117 | 0.0044 | 0.0173 | . | 0.0907 | . | . | 131 | . | . | . | . | . | . | |
| 1 | GBM922-13 | 1.0050 | 3.5 | . | 0.0052 | 0.0176 | 1.52 | 0.0931 | . | . | . | . | . | . | . | . | . | |
| 1 | NCS DC29108 | 0.90 | 14.9 | 0.00766 | . | 0.0080 | (1.65) | 0.020 | . | . | . | . | . | (0.028) | . | 11.7 | . | |
| 1 | NCS DC29107 | 0.29 | 6.1 | 0.00414 | . | 0.00345 | (0.68) | 0.010 | . | . | . | . | . | (0.15) | . | 23.4 | . | |
| 1 | IMN W2 | 0.285 | 6.2 | 0.00123 | . | 0.0412 | . | C:7.59 | Org.C:(0.361) | | . | . | . | . | . | . | . | 100 g units |
| 1 | IMN W7 | . | . | . | . | 0.00424 | . | . | . | . | . | . | . | . | . | . | . | 100 g units |
| # | Number | Cu | Ag* | As | Ni | Pb | Tot.S | Zn | Au* | Bi* | Co* | Cd* | Fe | Hg* | Mo* | Sb* | $SiO_2$ | |

## CRM COPPER ORE

analysis listed in mass % except * which is mg/kg

| Number | Cu | As | Bi | Cd | F | Fe | MgO | Mn | Ni | Pb | S | Sb | Zn | Ag* | Au* | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28058 | 20.56 | 0.012 | . | <0.001 | 0.056 | 24.70 | 7.63 | 0.013 | 0.093 | 0.015 | 22.87 | . | 0.194 | 17.1 | 4.68 | 20 g |
| NCS DC28055 | 12.79 | 4.68 | 0.023 | 0.0067 | 0.028 | 3.22 | 0.18 | 0.110 | 0.017 | 0.037 | 1.54 | 0.25 | 0.64 | 85.9 | 0.04 | 50 g |
| NCS DC28057 | 10.71 | 0.034 | . | <0.001 | 0.036 | 29.34 | 4.01 | 0.084 | 0.072 | 0.019 | 25.05 | . | 0.052 | 12.0 | 6.16 | 20 g |
| NCS DC28056 | 8.46 | 2.14 | 0.19 | 0.0064 | 0.53 | 10.44 | 7.04 | 0.169 | 0.011 | 0.087 | 0.86 | 0.22 | 0.503 | 109.9 | 0.05 | 50 g |
| NCS DC28054 | 6.78 | 0.209 | 0.283 | 0.0021 | 1.15 | 15.39 | 12.51 | 0.124 | <0.005 | 0.106 | 0.082 | . | 0.456 | 126.1 | 0.05 | 50 g |

## CRM COPPER ORE

analysis listed in mass % except * which is mg/kg 20 g units

| Number | Cu | Ag* | Au* | $Al_2O_3$ | As | Bi | CaO | Cd* | Co | F | Fe | MgO | Mn | Ni | Pb | S | $SiO_2$ | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28059a | 18.04 | 157.0 | 2.48 | 2.89 | 0.104 | 0.897 | 14.71 | 64 | 0.026 | 0.162 | 19.80 | 1.12 | 0.085 | 0.045 | 0.031 | 9.53 | 6.22 | 0.59 |

## CRM CORUNDUM

analysis listed in listed in mass 50 g units

| Number | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | Na2O | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC14225 | 99.04 | 0.029 | 0.043 | 0.002 | 0.012 | 0.45 | 0.016 | 0.061 | 0.024 | 0.29 |
| NCS DC14226 | 99.02 | 0.028 | 0.040 | 0.003 | 0.013 | 0.43 | 0.013 | 0.061 | 0.020 | 0.34 |
| NCS DC14224 | 96.00 | 0.31 | 0.21 | 0.048 | 0.28 | 0.014 | 0.024 | 0.68 | 2.28 | (0.04) |

## CRM CRYOLITE

analysis lsited in mass %

| Number | Al | CaO | F | $Fe_2O_3$ | Na | $P_2O_5$ | $SO_4^{2-}$ | $SiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC91001 | 17.34 | (0.606) | 55.45 | 0.053 | 21.75 | 0.0034 | 0.233 | 0.087 | 4.53 | 100 g |
| NCS DC91002 | 15.18 | (0.597) | 54.66 | 0.032 | 26.32 | 0.025 | 0.199 | 0.211 | 2.97 | 100 g |
| NCS DC91003 | 13.65 | (0.719) | 53.89 | 0.036 | 29.29 | 0.013 | 0.205 | 0.363 | 2.25 | 100 g |
| NCS DC91004 | 13.16 | (0.508) | 53.2 | 0.033 | 30.26 | 0.037 | 0.293 | 0.389 | 2.12 | 100 g |
| NCS DC91005 | 12.69 | (0.0062) | 52.14 | 0.0098 | 32.01 | 0.065 | 0.45 | 0.485 | 1.4 | 100 g |
| NCS DC91006 | 11.75 | 0.112 | 51.21 | 0.04 | 33.24 | 0.051 | 0.683 | 0.238 | 1.6 | 100 g |

## CRM DIABASE WITH EXTENSIVE ANALYSIS

analysis listed in mass % US: 25 g units NCS: 70 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | F | FeO | $Fe_2O_3$ | $Fe_2O_3T$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US W-2b~~ | ~~15.45~~ | ~~.~~ | ~~10.86~~ | ~~(0.0205)~~ | ~~8.34~~ | ~~1.53~~ | ~~10.83~~ | ~~.~~ | ~~0.626~~ | ~~6.37~~ | ~~0.167~~ | ~~2.20~~ | ~~0.14~~ | ~~(0.0079)~~ | ~~.~~ | ~~52.68~~ | ~~1.06~~ | ~~.~~ |
| ~~NCS DC71311~~ | ~~13.21~~ | ~~(0.11)~~ | ~~7.83~~ | ~~(0.07)~~ | ~~7.24~~ | ~~.~~ | ~~(13.40)~~ | ~~(2.44)~~ | ~~1.49~~ | ~~5.08~~ | ~~.~~ | ~~3.17~~ | ~~0.55~~ | ~~.~~ | ~~0.44~~ | ~~49.88~~ | ~~2.94~~ | ~~2.30~~ |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Cd | Ce | Cl% | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US W-2b~~ | ~~.~~ | ~~(1.2)~~ | ~~(12)~~ | ~~170~~ | ~~(1.3)~~ | ~~.~~ | ~~.~~ | ~~23~~ | ~~(0.0190)~~ | ~~43~~ | ~~92~~ | ~~(0.99)~~ | ~~110~~ | ~~3.6~~ | ~~(2.5)~~ | ~~(1.0)~~ | ~~17~~ | ~~.~~ |
| ~~NCS DC71311~~ | ~~0.33~~ | ~~5.1~~ | ~~17.0~~ | ~~614~~ | ~~1.5~~ | ~~0.39~~ | ~~0.39~~ | ~~78.1~~ | ~~(0.04)~~ | ~~37.5~~ | ~~111~~ | ~~1.7~~ | ~~82.6~~ | ~~5.5~~ | ~~(2.6)~~ | ~~3.5~~ | ~~21.2~~ | ~~7.2~~ |

| Number | Ge | Hf | Hg | Ho | La | Li | Lu | Mn% | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se | Sm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US W-2b~~ | ~~.~~ | ~~2.6~~ | ~~.~~ | ~~(0.76)~~ | ~~10~~ | ~~9.6~~ | ~~(0.33)~~ | ~~.~~ | ~~.~~ | ~~(7.9)~~ | ~~13~~ | ~~70~~ | ~~(9.3)~~ | ~~.~~ | ~~21~~ | ~~(0.79)~~ | ~~36~~ | ~~.~~ | ~~3.3~~ |
| ~~NCS DC71311~~ | ~~1.5~~ | ~~9.2~~ | ~~0.017~~ | ~~1.2~~ | ~~38.1~~ | ~~20.8~~ | ~~0.34~~ | ~~(0.16)~~ | ~~1.4~~ | ~~25.3~~ | ~~42.8~~ | ~~56.8~~ | ~~33.0~~ | ~~10.6~~ | ~~47.4~~ | ~~2.3~~ | ~~27.1~~ | ~~(0.19)~~ | ~~8.6~~ |

| Number | Sn | Sr | Ta | Tb | Th | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US W-2b~~ | ~~.~~ | ~~190~~ | ~~(0.5)~~ | ~~(0.63)~~ | ~~2.4~~ | ~~(0.38)~~ | ~~(0.53)~~ | ~~260~~ | ~~.~~ | ~~23~~ | ~~2.1~~ | ~~80~~ | ~~100~~ |
| ~~NCS DC71311~~ | ~~2.0~~ | ~~470~~ | ~~1.8~~ | ~~1.1~~ | ~~4.9~~ | ~~0.36~~ | ~~1.2~~ | ~~268~~ | ~~1.4~~ | ~~24.5~~ | ~~2.2~~ | ~~(160)~~ | ~~359~~ |

## DIORITE WITH EXTENSIVE ANALYSIS

analysis listed in mass % T = Total IAG: RM, ~35 g units all others: CRM, 100 g units

| Number | $Al_2O_3$ | CaO | $CO_2$ | Fe | FeO | $Fe_2O_3$ | $H_2O+$ | $H_2O-$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CAN SY-4~~ | ~~20.69~~ | ~~8.05~~ | ~~3.5~~ | ~~4.2~~ | ~~2.86~~ | ~~6.21~~ | ~~(1.0)~~ | ~~(0.15)~~ | ~~1.66~~ | ~~0.54~~ | ~~0.108~~ | ~~7.10~~ | ~~0.131~~ | ~~49.9~~ | ~~0.287~~ | ~~4.56~~ | ~~Diorite Gneiss~~ |
| VS 6103-91 | 16.56 | 4.84 | (0.18) | . | 3.79 | 5.55 | (1.6) | (0.14) | 2.98 | 3.05 | 0.086 | 3.57 | 0.17 | 60.45 | 0.86 | 1.59 | Quartz |
| USZ 50-2009 | 15.97 | 6.99 | . | . | 4.82 | 8.10T | 0.35 | (0.11) | 1.55 | 3.81 | 0.12 | 3.33 | (0.39) | 57.75 | 1.34 | 0.51 | Diorite |
| IAG OU-4 | 14.83 | 4.48 | . | . | 4.52 | 5.82T | . | . | 2.70 | 2.30 | 0.14 | 3.61 | 0.173 | 63.34 | 0.77 | 1.72 | Microdiorite |

continued analysis listed in mg/kg

| Number | B | Ba | Be | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Ga | Gd | Hf | Ho |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CAN SY-4~~ | ~~.~~ | ~~340~~ | ~~2.6~~ | ~~122~~ | ~~2.8~~ | ~~12~~ | ~~1.5~~ | ~~7~~ | ~~18.2~~ | ~~14.2~~ | ~~2.00~~ | ~~.~~ | ~~335~~ | ~~14.0~~ | ~~10.6~~ | ~~4.3~~ |
| VS 6103-91 | 46 | 720 | 2.4 | 46 | 17 | 58 | 2.9 | 39 | . | . | 1.3 | 710 | 18 | . | . | . |
| USZ 50-2009 | . | 425 | . | 50.8 | 84.9 | 100 | (5.24) | 100 | (4.29) | (2.29) | (1.41) | . | 419.58 | (5.21) | (3.69) | (0.85) |
| IAG OU-4 | . | 360.8 | 1.79 | 55.7 | 13.5 | 54.7 | 2.07 | 27.3 | 7.81 | 4.83 | 1.64 | . | 17.4 | 7.39 | 5.54 | 1.63 |

| Number | La | Li | Lu | Mn | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Sm | Sn | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CAN SY-4~~ | ~~58~~ | ~~37~~ | ~~2.1~~ | ~~819~~ | ~~13~~ | ~~57~~ | ~~9~~ | ~~10~~ | ~~15.0~~ | ~~55~~ | ~~.~~ | ~~1.1~~ | ~~12.7~~ | ~~.~~ | ~~1191~~ |
| VS 6103-91 | 27 | 30 | 0.30 | . | 12 | 24 | 33 | 24 | . | 83 | . | 15 | 4.8 | . | 410 |
| USZ 50-2009 | 24.40 | (13.9) | (0.30) | . | 6.92 | 30.48 | 40.94 | 8.97 | (6.45) | 48.5 | . | 20.46 | (5.61) | . | 454 |
| IAG OU-4 | 24.96 | 35.0 | 0.71 | . | 12.8 | 27.9 | 21.0 | 14.1 | 6.85 | 98.5 | 0.30 | 19.1 | 6.94 | 2.42 | 99.9 |

| Number | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CAN SY-4~~ | ~~0.9~~ | ~~2.6~~ | ~~1.4~~ | ~~.~~ | ~~2.3~~ | ~~0.8~~ | ~~8~~ | ~~.~~ | ~~119~~ | ~~14.8~~ | ~~93~~ | ~~517~~ |
| VS 6103-91 | . | . | 6.8 | . | . | . | 96 | . | 21 | 2.1 | 71 | 173 |
| USZ 50-2009 | (0.48) | (0.76) | 3.88 | . | (0.32) | (1.09) | 213 | 266 | 23.62 | 2.05 | 92.77 | 191 |
| IAG OU-4 | 1.00 | 1.25 | 8.42 | 0.46 | 0.72 | 2.19 | 82.7 | . | 47.1 | 4.70 | 69.5 | 195.1 |

## DOLERITE WITH EXTENSIVE ANALYSIS

# = class, where 1 = CRM and 2 = RM  analysis listed in mass % except * which is mg/kg

| # | Number | $SiO_2$ | $Al_2O_3$ | CaO | F | FeO | $Fe_2O_3$ | $Fe_2O_3T$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SARM 50 | 51.56 | 15.28 | 10.80 | . | 8.49 | 11.0 | . | | 0.61 | 7.57 | 0.17 | 2.30 | 0.15 | . | 0.86 | . | 100 g |
| 2 | IAG OU-2 | 51.095 | 13.801 | 8.994 | . | 8.404 | . | 13.253 | . | 0.990 | 5.585 | 0.170 | 2.480 | 0.300 | . | 2.425 | . | ~35 g |
| 2 | IAG OU-5 | 49.10 | 13.62 | 6.63 | . | 8.74 | 14.60 | . | . | 0.826 | 5.17 | 0.310 | 4.29 | 0.440 | . | 2.718 | 2.08 | ~35 g |
| 1 | VS 8671-2005 | 47.99 | 14.63 | 10.42 | (0.021) | 10.33 | . | 14.62 | (0.88) | 0.46 | 7.51 | 0.21 | 2.32 | 0.17 | (0.026) | 1.59 | (0.42) | 100 g |
| ~~1~~ | ~~US DNC-1a~~ | ~~47.15~~ | ~~18.34~~ | ~~11.49~~ | ~~(0.0066)~~ | ~~7.32~~ | ~~1.79~~ | ~~9.97~~ | | ~~0.234~~ | ~~10.13~~ | ~~0.15~~ | ~~1.89~~ | ~~0.07~~ | ~~.~~ | ~~0.48~~ | ~~.~~ | ~~25 g~~ |

continued  analysis listed in mg/kg

| Number | Ag | As | Au | B | Ba | Be | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 50 | . | . | . | . | 220 | . | . | (30) | . | 40 | 357 | . | 84 | . | . | . |
| IAG OU-2 | . | . | . | . | 341.1 | 1.11 | . | 60.2 | . | 44.8 | 97.0 | 0.495 | 63.0 | 6.09 | 3.06 | 2.23 |
| IAG OU-5 | . | (2.45) | . | . | 309.2 | 1.31 | (0.20) | 44.17 | . | 38.60 | 38.40 | 0.555 | 27.32 | 9.04 | 5.49 | 2.35 |
| VS 8671-2005 | (0.05) | . | (0.0026) | (3.8) | 227 | 0.8 | . | 22 | . | 52 | 213 | (0.45) | 180 | 5.1 | 2.9 | 1.4 |
| ~~US DNC-1a~~ | ~~.~~ | ~~(0.12)~~ | ~~.~~ | ~~(0.9)~~ | ~~118~~ | ~~(1)~~ | ~~.~~ | ~~.~~ | ~~(60)~~ | ~~57~~ | ~~270~~ | ~~.~~ | ~~100~~ | ~~(3)~~ | ~~.~~ | ~~0.59~~ |

| Number | Ga | Gd | Ge | Hf | Ho | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 50 | . | . | . | . | . | . | . | . | . | (10) | . | (85) | 25 | . | 14 |
| IAG OU-2 | 23.05 | 7.26 | . | 5.29 | 1.21 | 27.71 | 12.79 | 0.372 | 3.05 | 17.25 | 33.35 | 51.77 | 13.12 | 7.92 | 25.44 |
| IAG OU-5 | 21.2 | 8.64 | (2.03) | 5.59 | 1.92 | 18.10 | 21.74 | 0.767 | . | 9.58 | 28.47 | 15.00 | 4.66 | 6.29 | 19.29 |
| VS 8671-2005 | 17 | 4.5 | 1.5 | 2.7 | (1) | 8 | 8.6 | 0.44 | 0.98 | 6 | 13.2 | 126 | (3) | 2.6 | 11 |
| ~~US DNC-1a~~ | ~~(15)~~ | ~~(2)~~ | ~~.~~ | ~~.~~ | ~~(0.62)~~ | ~~3.6~~ | ~~5.2~~ | ~~.~~ | ~~.~~ | ~~(3)~~ | ~~5.2~~ | ~~247~~ | ~~(6.3)~~ | ~~.~~ | ~~(4.5)~~ |

| Number | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 50 | . | . | . | . | 195 | . | . | (6) | . | . | . | 216 | . | 23 | . | 81 | 86 |
| IAG OU-2 | . | 28.21 | 8.70 | 17.73 | 403.7 | 1.20 | 1.11 | 3.02 | . | 0.427 | 0.63 | 339.3 | . | 30.93 | 2.52 | 113.0 | 200.5 |
| IAG OU-5 | 0.42 | 42.4 | 7.64 | 2.00 | 226.8 | (0.546) | 1.46 | 2.25 | (0.125) | 0.789 | 0.500 | 447.8 | (0.865) | 51.8 | 5.10 | 133.6 | 219.9 |
| VS 8671-2005 | . | 41 | 4 | 2.64 | 197 | 0.35 | 0.8 | 1.0 | . | 0.44 | 0.45 | 315 | (0.4) | 29 | 3.3 | 112 | 125 |
| ~~US DNC-1a~~ | ~~0.96~~ | ~~31~~ | ~~.~~ | ~~.~~ | ~~144~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~148~~ | ~~.~~ | ~~18~~ | ~~2~~ | ~~70~~ | ~~38~~ |

## CRM DOLOMITE WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | CaO | MgO | $Al_2O_3$ | $CO_2$ | Cl | F | FeO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UL DWA1 | 30.84 | 21.40 | (0.05) | . | . | . | . | 0.27 | . | 0.010 | (0.06) | 0.042 | (0.023) | (0.06) | (0.010) | 47.29 | 50 g |
| ~~GBW 07114~~ | ~~30.02~~ | ~~21.8~~ | ~~0.10~~ | ~~46.77~~ | ~~0.012~~ | ~~0.014~~ | ~~0.15~~ | ~~0.04~~ | ~~(0.34)~~ | ~~0.038~~ | ~~0.010~~ | ~~(0.03)~~ | ~~0.006~~ | ~~0.62~~ | ~~0.015~~ | ~~.~~ | ~~50 g~~ |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Br | Tot.C% | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UL DWA1 | . | (1.3) | . | 24 | . | . | . | . | . | 2.2 | (0.2) | (4) | . | (4) | 0.82 | 0.50 | 0.16 | . | 0.81 |
| ~~GBW 07114~~ | ~~0.04~~ | ~~0.23~~ | ~~20.5~~ | ~~44.3~~ | ~~(0.22)~~ | ~~0.03~~ | ~~0.84~~ | ~~(12.88)~~ | ~~0.07~~ | ~~3.58~~ | ~~3.88~~ | ~~2.6~~ | ~~0.07~~ | ~~30.2~~ | ~~0.19~~ | ~~0.09~~ | ~~0.05~~ | ~~(0.21)~~ | ~~0.18~~ |

| Number | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | S% | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UL DWA1 | . | (0.03) | . | 0.18 | . | . | 3.6 | . | 0.05 | . | . | 3 | . | (35) | 0.67 | . | . | . |
| ~~GBW 07114~~ | ~~0.15~~ | ~~(0.10)~~ | ~~(0.004)~~ | ~~0.04~~ | ~~0.23~~ | ~~(0.066)~~ | ~~1.34~~ | ~~2.30~~ | ~~0.019~~ | ~~(0.24)~~ | ~~(2.77)~~ | ~~1.39~~ | ~~241~~ | ~~(4.44)~~ | ~~(0.44)~~ | ~~(1.42)~~ | ~~0.011~~ | ~~0.04~~ |

| Number | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UL DWA1 | 0.24 | . | 0.62 | . | 284 | . | 0.12 | . | 0.08 | . | 0.06 | 1.4 | 6.9 | . | 9.4 | 0.39 | 83 | . |
| ~~GBW 07114~~ | ~~0.098~~ | ~~0.08~~ | ~~0.25~~ | ~~0.53~~ | ~~49~~ | ~~(0.18)~~ | ~~0.05~~ | ~~(0.012)~~ | ~~0.11~~ | ~~(0.070)~~ | ~~(0.040)~~ | ~~0.16~~ | ~~2.10~~ | ~~0.11~~ | ~~(1.40)~~ | ~~0.09~~ | ~~11.7~~ | ~~3.0~~ |

## DOLOMITE

# = class, where 1 = CRM and 2 = RM analysis listed in mass %

| # | Number | CaO | MgO | $SiO_2$ | $Al_2O_3$ | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | MnO | $Na_2O$ | P | $P_2O_5$ | PbO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NCS DC28009a | 45.90 | 6.65 | 2.56 | 0.47 | . | 0.235 | 0.272 | 0.0049 | 0.012 | 0.0033 | . | . |
| 1 | NCS DC28206 | 41.66 | 11.31 | 4.64 | 0.16 | . | 0.112 | . | 0.0050 | . | 0.0032 | . | . |
| 1 | NCS DC14020b | 35.73 | 15.28 | 4.21 | 0.92 | . | 0.533 | 0.017 | 0.022 | 0.015 | 0.0032 | . | . |
| 1 | NCS DC14021b | 34.82 | 17.34 | 1.30 | 0.18 | . | 0.447 | 0.027 | 0.0072 | 0.019 | 0.0057 | . | . |
| 1 | NCS DC28203 | 34.74 | 17.16 | 1.45 | 0.286 | . | 0.404 | . | 0.012 | . | 0.016 | . | . |
| 1 | NCS DC28015a | 33.60 | 15.50 | 4.89 | 1.40 | . | 0.641 | 0.35 | 0.0085 | 0.019 | 0.011 | . | . |
| 1 | NCS DC14018b | 31.96 | 19.92 | 0.77 | 0.23 | . | 0.269 | 0.030 | 0.031 | 0.033 | 0.0023 | . | . |
| 1 | NCS DC11003a | 31.49 | 21.06 | 0.098 | 0.083 | . | 0.024 | 0.0030 | 0.0061 | 0.017 | 0.0016 | . | . |
| 1 | NCS DC28014a | 31.46 | 18.60 | 2.97 | 0.81 | . | 0.472 | 0.29 | 0.012 | 0.021 | 0.0061 | . | . |
| 1 | NCS DC28013a | 31.12 | 19.10 | 2.65 | 0.73 | . | 0.504 | 0.13 | 0.011 | 0.034 | 0.0034 | . | . |
| ~~1~~ | ~~NCS DC28012a~~ | ~~30.94~~ | ~~20.92~~ | ~~1.48~~ | ~~0.23~~ | ~~.~~ | ~~0.26~~ | ~~0.085~~ | ~~0.011~~ | ~~0.012~~ | ~~0.014~~ | ~~.~~ | ~~.~~ |
| 1 | NCS DC28208 | 30.80 | 20.79 | 0.99 | 0.23 | . | 0.32 | . | 0.019 | . | 0.0013 | . | . |
| 1 | NCS DC28202 | 30.79 | 20.73 | 2.12 | 0.203 | . | 0.275 | . | 0.026 | . | 0.0013 | . | . |
| 1 | NCS DC28201 | 30.62 | 20.53 | 6.75 | 0.048 | . | 0.085 | . | 0.0072 | . | 0.0012 | . | . |
| 1 | BCS 512 | 30.61 | 21.59 | 0.379 | 0.055 | (<0.001) | 0.030 | (<0.02) | 0.0036 | . | . | (<0.02) | (<0.001) |
| 1 | CGL 021 | 30.59 | 21.40 | 0.267 | 0.200 | . | 0.228 | 0.062 | 0.047 | (0.040) | . | 0.044 | . |
| 2 | DH 0915 | 30.59 | 21.21 | 0.035 | 0.019 | . | 0.191 | 0.007 | 0.050 | 0.026 | . | 0.008 | . |
| ~~1~~ | ~~ECRM 782-1~~ | ~~30.34~~ | ~~21.29~~ | ~~0.266~~ | ~~0.104~~ | ~~0.0009~~ | ~~0.450~~ | ~~0.0260~~ | ~~0.081~~ | ~~.~~ | ~~.~~ | ~~0.0128~~ | ~~0.0029~~ |
| 1 | NCS DC28207 | 30.33 | 20.88 | 1.26 | 0.27 | . | 0.44 | . | 0.013 | . | 0.018 | . | . |
| 2 | FLX 135 | 30.00 | 21.24 | 0.969 | 0.276 | . | 0.162 | 0.063 | $Mn_2O_3$: 0.052 | | . | . | . |

| Number | S | Sr | SrO | Ti | $TiO_2$ | ZnO | LOI | Units | |
|---|---|---|---|---|---|---|---|---|---|
| NCS DC28009a | 0.021 | . | 0.020 | . | 0.024 | . | 43.48 | 50 g | |
| NCS DC28206 | 0.0093 | . | 0.015 | . | 0.0056 | . | 41.70 | 50 g | |
| NCS DC14020b | 0.030 | 0.026 | . | 0.025 | . | . | 42.69 | 70 g | |
| NCS DC14021b | 0.009 | 0.021 | . | 0.085 | . | . | 45.37 | 50 g | |
| NCS DC28203 | 0.028 | . | . | . | . | . | 45.58 | 50 g | |
| NCS DC28015a | 0.013 | . | 0.0060 | . | 0.074 | . | 43.24 | 50 g | |
| NCS DC14018b | 0.010 | 0.0081 | . | 0.011 | . | . | 46.24 | 70 g | |
| NCS DC11003a | 0.011 | 0.021 | . | 0.0043 | . | . | 46.71 | 70 g | |
| NCS DC28014a | 0.019 | . | 0.0058 | . | 0.041 | . | 44.94 | 50 g | |
| NCS DC28013a | 0.007 | . | 0.0064 | . | 0.034 | . | 45.49 | 50 g | |
| ~~NCS DC28012a~~ | ~~0.003~~ | ~~.~~ | ~~0.0070~~ | ~~.~~ | ~~0.0080~~ | ~~.~~ | ~~45.58~~ | ~~50 g~~ | |
| NCS DC28208 | 0.022 | . | . | . | . | . | 46.20 | 50 g | |
| NCS DC28202 | 0.016 | . | . | . | . | . | 45.22 | 50 or 100 g | |
| NCS DC28201 | 0.0019 | . | . | . | . | . | 41.00 | 50 g | |
| BCS 512 | . | . | 0.024 | . | 0.0020 | (<0.01) | 46.80 | 100 g | |
| CGL 021 | . | (0.0057) | . | . | (0.013) | . | (46.63) | 50 g | C:(12.925) |
| DH 0915 | . | . | . | . | . | . | . | 100 g | |
| ~~ECRM 782-1~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0042~~ | ~~0.0082~~ | ~~47.25~~ | ~~100 g~~ | |
| NCS DC28207 | 0.033 | . | . | . | . | . | 46.11 | 50 g | |
| FLX 135 | . | . | . | . | . | . | . | 30 g | |

## RM DOLOMITE SUBSTITUTE

typical analysis in mass % * DH 0710 also contains 0.015 CuO ** DH 0712 also contains 0.167 $Na_2O$ and 0.012 $Nb_2O_5$ 100 g units

| Number | CaO | MgO | $Al_2O_3$ | $Cr_2O_3$ | Fe | $K_2O$ | $Mn_3O_4$ | NiO | $P_2O_5$ | PbO | S | $SiO_2$ | SrO | $TiO_2$ | $V_2O_5$ | ZnO | $ZrO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~DH 0710 *~~ | ~~35.36~~ | ~~35.30~~ | ~~8.28~~ | ~~0.591~~ | ~~5.14~~ | ~~0.077~~ | ~~1.079~~ | ~~0.013~~ | ~~0.107~~ | ~~0.011~~ | ~~0.265~~ | ~~10.23~~ | ~~0.028~~ | ~~0.301~~ | ~~0.032~~ | ~~0.159~~ | ~~0.051~~ |
| DH 0711 | 32.46 | 28.57 | 9.49 | 0.84 | 8.81 | 0.092 | 1.745 | 0.020 | 0.262 | 0.015 | 0.314 | 12.07 | 0.029 | 0.370 | 0.056 | 0.183 | 0.068 |
| ~~DH 0709~~ | ~~23.45~~ | ~~63.07~~ | ~~5.62~~ | ~~0.071~~ | ~~1.96~~ | ~~0.053~~ | ~~0.444~~ | ~~0.010~~ | ~~0.133~~ | ~~0.029~~ | ~~0.097~~ | ~~3.69~~ | ~~0.011~~ | ~~0.131~~ | ~~0.021~~ | ~~0.014~~ | ~~0.057~~ |
| DH 0712 ** | 20.16 | 32.62 | 20.79 | 0.560 | 6.72 | 0.146 | 0.906 | 0.050 | 0.141 | 0.008 | 0.129 | 13.30 | 0.016 | 0.671 | 0.039 | 0.052 | 0.383 |

## DUNITE

# = class, where 1 = CRM and 2 = RM  analysis listed in mass %  DH, SARM: 100 g  US: 25 g  VS 2112: 40 g  VS 4233: 100 g

| # | Number | MgO | $SiO_2$ | Si | $Al_2O_3$ | Al | $CO_2$ | Tot.C | CaO | Ca | Co | Cr | $Cr_2O_3$ | T.Fe | FeO | $Fe_2O_3$ | T.$Fe_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~1~~ | ~~US DTS-2B~~ | ~~49.4~~ | ~~39.4~~ | ~~18.4~~ | ~~0.45~~ | ~~0.24~~ | ~~.~~ | ~~.~~ | ~~0.12~~ | ~~0.09~~ | ~~0.0120~~ | ~~1.5500~~ | ~~.~~ | ~~5.43~~ | ~~(4.27 FeII)~~ | ~~.~~ | ~~7.76~~ |
| 1 | SARM 6 | 43.51 | 38.96 | . | (0.3) | . | . | . | 0.28 | . | . | . | 0.42 | . | 14.63 | 0.71 | . |
| 1 | VS 2112-81 | 42.40 | 35.07 | . | . | . | 0.46 | . | . | . | 0.0129 | . | . | . | . | . | 10.06 |
| 1 | VS 4233-88 | 41.86 | 39.58 | . | 0.97 | . | (1.61) | . | 1.52 | . | 0.012 | 0.41 | . | . | (5.54) | . | 8.91 |

continued  analysis listed in mass %

| Number | $H_2O$ | $K_2O$ | Mg | MnO | Na | $Na_2O$ | Ni | $P_2O_5$ | S | $TiO_2$ | V | LOI @ 900 ‘C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US DTS-2B~~ | ~~.~~ | ~~.~~ | ~~29.8~~ | ~~.~~ | ~~(0.02)~~ | ~~.~~ | ~~0.3780~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0022~~ | ~~.~~ |
| SARM 6 | . | (0.01) | . | 0.22 | . | (0.04) | . | . | . | (0.02) | . | . |
| VS 2112-81 | 11.35 | . | . | 0.176 | . | . | 0.133 | . | . | . | 0.00069 | . |
| VS 4233-88 | (+4.82 -0.4) | 0.010 | . | 0.13 | . | 0.035 | 0.22 | (0.01) | (0.041) | 0.018 | 0.0033 | 6.31 |

continued  analysis listed in mg/kg except % which is mass %

| Number | Ba | Cu | Ge | Li | Mn | Mo | Pb | Rb | Sb | Sc | Sn | Sr | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US DTS-2B~~ | ~~(16)~~ | ~~(3)~~ | ~~(0.7)~~ | ~~.~~ | ~~830~~ | ~~.~~ | ~~(4)~~ | ~~(2)~~ | ~~(0.6)~~ | ~~(3)~~ | ~~.~~ | ~~.~~ | ~~45~~ |
| SARM 6 | . | . | . | . | . | . | . | . | . | . | . | . | . |
| VS 2112-81 | . | 27 | . | . | . | 1.4 | . | . | . | . | 2.2 | . | 82 |
| VS 4233-88 | . | 33 | 1.1 | 2.0 | . | . | . | . | . | 9 | . | 18 | 30 |

$H_2O+$: (4.82)

## FELDSPAR

# = class, where 1 = CRM and 2 = RM  analysis listed in mass %

| # | Number | $SiO_2$ | $Al_2O_3$ | BaO | CaO | F | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | PbO | $Rb_2O$ | SrO | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BCS 532 | 77.07 | 13.46 | . | 0.212 | . | 0.181 | 3.80 | 0.159 | 4.35 | . | . | . | . | . | 0.56 | 100 g |
| 1 | FLX CRM129 | 69.84 | 16.44 | 0.130 | 0.374 | . | (0.104) | 10.78 | . | 2.11 | 0.068 | . | . | (0.014) | (0.036) | (0.428) | 40 g |
| 1 | BCS 375/1 | 69.24 | 17.88 | . | 0.78 | . | 0.291 | 1.47 | 0.180 | 8.89 | 0.226 | . | . | . | 0.312 | 0.72 | 100 g |
| 1 | FLX CRM128 | 67.88 | 19.95 | (0.007) | 1.08 | . | (0.021) | 0.206 | . | 10.74 | (0.008) | . | . | (0.049) | (0.017) | (0.171) | 40 g |
| 2 | DH X1602 | 66.93 | 17.16 | 0.323 | 0.032 | 0.047 | . | 14.19 | 0.001 | . | 0.087 | 0.012 | . | 0.036 | 0.038 | . | 100 g |
| 1 | GBW 03116 | 66.26 | 18.63 | . | 0.76 | . | 0.19 | 9.60 | 0.054 | 3.69 | . | . | . | . | 0.048 | 0.86 | 50 g |
| 1 | IPT 72 | 66.2 | 20.26 | . | 0.18 | . | 0.09 | 1.47 | (0.022) | 10.0 | 1.03 | . | . | . | 0.005 | 0.66 | 80 g |
| 1 | IPT 53 | 65.8 | 18.3 | . | 0.27 | . | 0.13 | 12.1 | 0.05 | 2.5 | 0.072 | . | . | . | 0.013 | 0.51 | 80 g |
| 1 | BCS 376/1 | 65.77 | 18.63 | 0.0210 | 0.421 | . | 0.085 | 11.59 | (0.03) | 3.00 | (0.02) | 0.0090 | . | . | (<0.01) | 0.203 | 100 g |
| 1 | BCS 529 | 56.24 | 26.84 | . | 9.58 | . | 0.273 | 0.421 | 0.045 | 5.58 | . | . | . | . | . | 0.550 | 100 g |

| | Number | Si | Al | Ba | Ca | Fe | K | Na | P | Pb | Rb | Sr | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SRM 99b | (32.07) | 10.36 | 0.1409 | (1.18) | . | 0.02787 | 3.09 | . | 5.25 | (0.0044) | 0.00712 | 0.00726 | 0.0444 | . | . | 40 g |

## CRM FELDSPAR WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | | $K_2O$ | $Li_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $Rb_2O$ | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW FK | 88.2 | 6.18 | . | 0.110 | . | 0.261 | . | . | | 4.23 | . | 0.15 | 0.0037 | 0.25 | 0.077 | . | 0.058 | . | 50 g |
| UNS ZK | 74.38 | 14.19 | . | 0.43 | 0.73 | 0.88 | . | . | | 4.06 | 0.06 | 0.067 | 0.025 | 4.50 | . | 0.094 | 0.039 | 0.54 | 100 g |
| JF-1 | 66.69 | 18.08 | . | 0.93 | . | 0.06 | 0.08 | +0.23 | -0.13 | 9.99 | . | 0.006 | 0.001 | 3.37 | 0.01 | . | 0.005 | . | 100 g |
| JF-2 | 65.30 | 18.52 | . | 0.09 | . | 0.06 | 0.06 | +0.24 | -0.18 | 12.94 | . | . | 0.001 | 2.39 | . | . | 0.005 | . | 20 or 100 g |
| VS 811-89 | 60.67 | 18.20 | 0.20 | 0.51 | 4.8 | 7.20 | . | 4.0 | | 3.43 | . | 2.22 | 0.042 | 2.31 | 0.19 | . | 0.94 | . | 100 g |
| SRM 70b | . | . | . | . | . | . | . | . | | . | . | . | . | . | . | . | . | . | 40 g |

analysis listed in mg/kg except % indicating mass %, * indicating ppb, and ! indicating scientific notation

| Number | Al% | As | B% | Ba% | Be | Ca% | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | F% | Fe% | Ga | Ge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW FK | . | . | . | 0.0700 | . | . | . | . | . | 2.6 | 11 | . | . | . | . | . | 6 | . |
| UNS ZK | . | 4.8 | . | . | . | . | 5.7 | 7.0 | . | 38.7 | 12.2 | . | . | . | . | . | 33.3 | . |
| JF-1 | 9.57 | . | . | 0.1750 | . | 0.66 | 4.19 | 0.12 | 5.48 | 2.09 | 0.82 | 0.39 | 0.31 | 0.87 | . | 0.06 | 17.4 | . |
| JF-2 | 9.80 | . | . | 0.0298 | . | 0.06 | 0.84 | 0.68 | . | 1.06 | 0.78 | . | . | 0.59 | . | 0.04 | 17.9 | . |
| VS 811-89 | . | . | 0.008 | 0.09 | 3.0 | . | 0.007* | 21 | 96 | 6.3 | 41 | . | . | . | 0.06 | . | 22 | 1.7 |
| SRM 70b | 7.98 | . | . | 0.00282 | . | 0.1770 | . | . | . | . | . | . | . | . | . | (0.13) | . | . |

| Number | Hf | Ho | K% | La | Li% | Mg% | Mn% | Mo | Na% | Nb | Nd | Ni | P% | Pb | Pr | Ra! | Rb% | S% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW FK | . | . | . | . | 0.0008 | . | . | . | . | . | . | . | 0.004 | 18 | . | . | 0.0132 | . |
| UNS ZK | 1.4 | . | . | . | . | . | . | 21.0 | . | 33.5 | . | 29.4 | . | . | . | . | . | |
| JF-1 | 1.18 | 0.11 | 8.29 | 2.80 | 0.000981 | 0.004 | 0.001 | . | 2.50 | 0.74 | 1.46 | . | . | 33.4 | 0.48 | . | 0.0266 | . |
| JF-2 | 0.19 | . | 10.74 | 0.63 | 0.000219 | . | 0.001 | . | 1.77 | 0.70 | . | . | . | 48.7 | . | . | 0.0218 | . |
| VS 811-89 | . | . | . | . | 0.006 | . | . | 2.0 | . | 14 | . | 59 | . | 20 | . | 3e-10 | 0.012 | 0.087 |
| SRM 70b | . | . | 6.33 | . | . | (0.0298) | 0.00630 | . | 2.36 | . | . | . | 0.0790 | (57) | . | . | (0.0495) | . |

| Number | Sc | Si% | Sm | Sr% | Ta | Tb | Th | Ti% | Tl | U | V | Y | Yb | Zn% | Zr% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW FK | . | . | . | 0.0072 | . | . | . | . | . | . | . | . | . | 0.0014 | . |
| UNS ZK | 3.6 | . | 16.8 | . | 19.4 | . | 4.7 | . | . | . | . | 8.4 | . | 0.00194 | . |
| JF-1 | 0.23 | 31.17 | 0.41 | 0.0172 | 0.079 | 0.076 | 1.17 | 0.003 | 1.18 | 0.33 | 5.43 | 2.84 | 0.35 | 0.000441 | 0.00386 |
| JF-2 | 0.089 | 30.52 | 0.11 | 0.0200 | . | . | 0.31 | 0.003 | 1.10 | . | 4.86 | 2.67 | . | 0.000140 | 0.000673 |
| VS 811-89 | 19 | . | 3.2 | 0.017 | 1.3 | . | 11 | . | . | 2.5 | 0.016% | 32 | 3.4 | 0.012 | 0.021 |
| SRM 70b | . | (34.4) | . | (0.0027) | . | . | . | (0.0032) | . | . | (0.93) | . | . | (0.00077) | . |

## CRM TRACE ELEMENTS IN FELDSPAR

analysis listed in mg/kg

| Number | Rb | Uncertainty | Sr | Uncertainty | $^{87}Sr/^{86}Sr$ | $^{86}Sr/^{88}Sr$ | Units |
|---|---|---|---|---|---|---|---|
| ~~SRM 607~~ | ~~523.90~~ | ~~1.01~~ | ~~65.485~~ | ~~0.320~~ | ~~1.20039~~ | ~~0.1194~~ | ~~5 g~~ |

## CRM FLUORSPAR (FLUORITE)

analysis listed in mass % NCS DC62003a: 20g NCS DC14046-8,NCS DC282x, $RHO_3$: 50g other NCS, CMSI, GBW: 65g SRM: 120g all others: 100g

| Number | $CaF_2$ | F | $Al_2O_3$ | BaO | $CaCO_3$ | CaO | Fe | $Fe_2O_3$ | $K_2O$ | $Na_2O$ | P | S | $SiO_2$ | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC14026b | 98.90 | . | $BaSO_4$:(0.03) | | 0.31 | . | . | 0.039 | . | . | 0.0083 | 0.010 | 0.70 | As:(0.00009) Pb:(0.0002) |
| SRM 180 | 98.80 | . | . | . | . | . | . | . | . | . | . | . | . | |
| SARM 15 | 97.84 | . | . | . | 0.95 | . | . | (0.23) | . | . | 0.007 | . | (0.26) | $MgCO_3$: 0.55 Mn: 0.0213 |
| SARM 14 | 97.32 | . | . | . | (0.3) | . | . | (0.06) | . | . | (0.079) | . | (0.57) | |
| BCS 392 | 97.2 | . | . | 0.37 | . | 0.52 | . | . | . | . | . | 0.12 | 0.67 | $CO_2$: 0.48 Pb: 0.18 |
| JK D | 97.07 | 47.24 | 0.04 | . | . | . | . | 0.20 | . | . | 0.035 | 0.004 | (1.5) | |
| NCS DC28088 | 96.87 | . | 0.14 | . | 0.14 | . | . | 0.173 | 0.036 | 0.019 | 0.015 | 0.092 | 1.76 | MgO: 0.015 Mn: 0.040 |
| NCS DC28228 | 94.81 | . | . | . | 0.99 | . | 0.26 | . | . | . | 0.076 | 0.107 | 2.76 | Mn: 0.010 |
| NCS DC14022a | 93.68 | . | . | . | 0.30 | . | 0.166 | . | 0.026 | 0.006 | 0.014 | 0.35 | 3.06 | |
| GBW 07252 | 92.57 | . | . | . | (0.02) | . | . | 0.124 | 0.029 | 0.006 | 0.0024 | 0.043 | 6.84 | last of stock |
| ~~VS 3383-86~~ | ~~91.84~~ | ~~.~~ | ~~0.53~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.612~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.063~~ | ~~0.095~~ | ~~5.03~~ | |
| ~~GBW 07251~~ | ~~90.87~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.02)~~ | ~~.~~ | ~~.~~ | ~~0.124~~ | ~~0.026~~ | ~~0.005~~ | ~~0.0031~~ | ~~0.090~~ | ~~8.35~~ | |
| NCS DC28230 | 90.72 | . | . | . | 0.87 | . | 0.25 | . | . | . | 0.063 | 0.084 | 7.68 | Mn: 0.012 |
| CGL 132 | 88.65 | . | . | . | (0.78) | . | . | . | . | . | (0.012) | (0.019) | 10.15 | |
| NCS DC28229 | 85.56 | . | . | . | 0.58 | . | 0.28 | . | . | . | 0.045 | 0.079 | 10.62 | Mn: 0.013 |
| IPT 95 | 85.4 | . | . | . | . | . | . | 0.36 | . | . | . | . | 8.3 | |
| GBW 07253 | 85.21 | . | . | . | (0.02) | . | . | 0.209 | 0.044 | 0.005 | 0.0013 | 0.045 | 14.15 | |
| VS SH13 | 84.7 | . | . | . | 0.51 | . | 0.353 | . | . | . | 0.012 | 0.103 | 13.0 | |
| NCS DC28087 | 83.12 | . | 0.69 | . | 1.06 | . | . | 0.36 | 0.28 | 0.031 | 0.018 | 0.050 | 13.74 | MgO: 0.14 Mn: 0.0099 |
| NCS DC28227 | 78.75 | . | . | . | 0.33 | . | 0.28 | . | . | . | . | 0.028 | 19.36 | Mn: 0.012 |
| NCS DC28226 | 77.33 | . | . | . | 0.20 | . | 0.31 | . | . | . | . | 0.068 | 18.04 | Mn: 0.014 |
| NCS DC28086 | 73.73 | . | 1.07 | . | 2.06 | . | . | 0.87 | 0.38 | 0.054 | 0.023 | 0.28 | 19.27 | MgO: 0.73 Mn: 0.027 |
| NCS DC62003a | 60.98 | . | 3.69 | . | . | 1.17 | . | 2.35 | 1.44 | 0.52 | . | SO3:0.12 | 26.20 | MgO: 0.18 $TiO_2$: 0.15 LOI: 1.38 |
| NCS DC28085 | 60.16 | . | 1.29 | . | 3.73 | . | . | 1.32 | 0.41 | 0.067 | 0.021 | 0.52 | 27.17 | MgO: 1.99 Mn: 0.034 |
| NCS DC28084 | 46.59 | . | 0.99 | . | 9.08 | . | . | 0.52 | 0.34 | 0.061 | 0.0071 | 0.071 | 28.89 | MgO: 5.51 Mn: 0.051 |
| CGL 135 | 35.60 | . | . | . | (0.68) | . | . | . | . | . | 0.037 | 0.41 | 47.67 | |
| ~~VS 4182-87~~ | ~~32.75~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.70~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.114~~ | ~~0.038~~ | ~~47.52~~ | |
| ~~VS 5132-89~~ | ~~32.69~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~11.75~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(27.68)~~ | |
| ~~VS 5133-89~~ | ~~4.17~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.10~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | |
| Number | $CaF_2$ | F | $Al_2O_3$ | BaO | $CaCO_3$ | CaO | Fe | $Fe_2O_3$ | $K_2O$ | $Na_2O$ | P | S | $SiO_2$ | Others |

## FLUORSPAR (FLUORITE)

# = class where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg IGS: 55 g all others: 100 g

| # | Number | Ca | F | $Al_2O_3$ | BaO | $CO_2$ | CuO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $SiO_2$ | $SO_4$ | $TiO_2$ | ZnO | LOI 900'C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IGS 39 | . | 46.69 | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| ~~2~~ | ~~DH 2712~~ | ~~44.18~~ | ~~40.6~~ | ~~1.01~~ | ~~.~~ | ~~2.11~~ | ~~0.199~~ | ~~0.373~~ | ~~0.125~~ | ~~0.739~~ | ~~0.237~~ | ~~.~~ | ~~8.91~~ | ~~0.103~~ | ~~0.069~~ | ~~0.103~~ | ~~0.370~~ |
| 2 | DH 2709 | 39.98 | 38.10 | 0.310 | . | 0.027 | 0.052 | 15.72 | 0.029 | 0.017 | 0.077 | 0.030 | 3.93 | 0.027 | . | 0.004 | 0.929 |
| 1 | USZ HJ | 37.32 | 34.92 | 2.35 | . | . | . | 0.34 | 0.99 | . | . | . | 23.01 | . | 0.047 | . | . |
| 1 | UNS FM ** | 35.89 | 34.03 | (0.329) | 3.89 | (0.13) | . | 0.496 | 0.097 | (0.036) | . | (0.087) | 22.59 | . | 0.018 | . | . |

| Number | Bi* | Ce* | Cr* | $Cr_2O_3$% | Cu* | Eu* | La* | Mo* | Pb* | S | Sb* | Sc* | Sm* | Sr% | Y* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IGS 39 | . | . | . | . | . | . | . | . | . | . | . | . | . | (0.014) | . |
| ~~DH 2712~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.106~~ | ~~.~~ | ~~. NiO:0.153~~ | ~~.~~ | ~~. PbO:0.102~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~$SnO_2$:0.054~~ | ~~.~~ | ~~.~~ |
| DH 2709 | . | . | . | 0.004 | . | . | . | . | . | . | . | . | . | . | . |
| USZ HJ | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| UNS FM ** | (58.8) | 28.3 | 272 | . | 60.7 | 1.16 | 14.1 | 44.6 | 72.2 | 0.91 | 2.1 | 0.67 | 5.6 | (0.0580) | 154 |

** UNS FM also contains Co: 2.6*, Cs: 0.81*, Mn: 64*, U: 2.9*, Yb: 3* and trace informational values for 19 other elements

## CRM GABBRO

analysis listed in mass % 40 g units

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | F | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | $H_2O+$ | $T.H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS MO8 | 51.98 | 16.39 | 0.43 | 9.02 | 0.0390 | 9.61 | 0.85 | 11.55 | 0.088 | 0.22 | 0.31 | 0.46 | 6.39 | 0.16 | 3.27 | 0.21 | 0.1700 | 1.15 |
| VS MO7 | 40.79 | 17.60 | 0.03 | 14.62 | 0.1300 | 7.76 | 3.73 | 12.35 | 0.12 | 0.70 | 0.82 | 0.75 | 6.46 | 0.15 | 2.05 | 1.08 | 0.1800 | 3.39 |

continued analysis listed in mg/kg except % which is mass % VS MO8: Gabbro VS MO7: Orthoclase Gabbro

| Number | B | Ba | Be | Co | Cr | Cs | Cu | Ga | La | Li | Mo | Nb | Ni | Pb | Rb | Sc | Sn | Sr | V | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS MO8 | 7.5 | 272 | 0.8 | 48 | 126 | 1.1 | 40 | 18 | 26 | 5.5 | 3.2 | 3.7 | 18 | 7.3 | 4.0 | 31 | 2.7 | 477 | 199 | 18 | 2.0 | 84 | 48 |
| VS MO7 | 4.5 | 7480 | (1.2) | 49 | 76 | 1.1 | 59 | (18) | 37 | 5.4 | (2.4) | 12 | 45 | 7.6 | 12 | (25) | (3.8) | 1745 | 270 | . | . | 65 | 53 |

## CRM GABBRO WITH EXTENSIVE ANALYSIS

analysis listed in mass % except * which is mg/kg CAN WMG-1A: 350 g CGL: 100 or 250 g GBW: 50 g JGb-1: 20 g others: 100 g

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | F | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 51-2009 | 48.00 | 26.26 | . | 13.61 | (0.085) | 2.00 | . | 4.22 | (+0.61 -0.13) | 0.31 | 2.85 | 0.080 | 2.42 | 0.078 | 0.37 | 1.40 |
| VS 8670-2005 | 46.63 | 14.93 | . | 10.68 | 0.13 | 6.23 | . | 11.33 | (+0.93) | 3.09 | 6.81 | 0.167 | 2.72 | 1.03 | 1.72 | (0.77) |
| JGb-2 | 46.47 | 23.48 | . | 14.10 | . | 5.41 | 0.62 | 6.69 | -0.14 | 0.059 | 6.18 | 0.13 | 0.92 | 0.017 | 0.56 | . |
| JGb-1 | 43.66 | 17.49 | . | 11.90 | 0.0133 | 9.43 | 4.79 | 15.06 | +1.28 -0.13 | 0.24 | 7.85 | 0.189 | 1.20 | 0.056 | 1.60 | . |
| CGL 013 | 43.15 | 22.57 | . | 14.99 | (0.099) | 4.57 | . | 10.99 | (+0.46 -0.21) | 0.11 | 4.51 | 0.10 | 1.41 | (0.038) | 0.94 | (1.03) |
| VS 2117-81 | 37.62 | 13.67 | (0.16) | 15.75 | 0.0720 | 9.05 | 18.54 | . | (0.12) | 0.204 | 8.66 | 0.222 | 0.72 | 2.15 | 1.46 | . |
| GBW 07112 | 35.69 | 14.14 | 0.12 | 9.86 | 0.006 | 13.36 | 9.90 | . | 1.09 | 0.15 | 5.25 | 0.193 | 2.11 | 0.028 | 7.69 | . |
| Number | Si | Al | . | Ca | | Fe | | | | K | Mg | Mn | Na | P | Ti | |
| JGb-1 * | 20.41 | 9.26 | . | 8.50 | . | 10.53 | 4.79 | 15.05 | +1.28 -0.13 | 0.20 | 4.73 | 0.146 | 0.89 | 0.024 | 0.96 | . |
| CAN WMG-1A | 18.27 | 4.75 | . | 10.06 | . | 12.71 | . | . | . | 0.1021 | 7.41 | (0.1141) | 0.1119 | 0.0731 | 0.419* | (4.31) |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba% | Be | Bi | Cd | Ce | Cl% | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 51-2009 | . | . | . | 0.0119 | . | . | . | 7.90 | . | 14.93 | 69.97 | . | 45.32 | . | . | . | 18.87 | . |
| VS 8670-2005 | (0.09) | . | (15) | 0.152 | 1.9 | . | . | 163 | . | 40 | 58 | 3.3 | 58 | 6.2 | 2.8 | 3.9 | 17 | 11.5 |
| JGb-2 | . | . | . | 0.00365 | . | . | . | 3.0 | . | 25.8 | 125 | 0.51 | 11.4 | . | . | 0.59 | 15.9 | . |
| JGb-1 | . | 1.09 | 4.03 | 0.00643 | . | . | 0.087 | 8.17 | . | 60.1 | 57.8 | 0.26 | 85.7 | 1.56 | 1.04 | 0.62 | 17.9 | 1.61 |
| CGL 013 | . | . | . | 0.004994 | . | . | . | (3.43) | . | 35.21 | 35.72 | . | 608 | (0.79) | (0.44) | (0.37) | 17.94 | (0.8) |
| VS 2117-81 | . | . | . | 0.0110 | . | . | . | . | . | 65 | 14 | . | 3600 | . | . | . | 21 | . |
| GBW 07112 | 0.05 | . | 1.84 | 0.00862 | . | 0.04 | 0.09 | 4.2 | 0.006 | 93.0 | 14.5 | . | 28.3 | 1.11 | 0.47 | 0.74 | 23.7 | 1.31 |
| CAN WMG-1A | 3.03 | 5.99 | . | 0.0216 | . | (0.251) | (0.818) | (17.18) | . | 191 | 804 | . | 7120 | 2.291 | (1.34) | (0.733) | (12.4) | (2.351) |

| Number | Ge | Hf | Ho | I | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pd | Pb | Pr | Pt | Rb | S% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 51-2009 | . | . | . | . | . | . | . | . | . | . | . | 23.94 | . | 6.00 | . | . | 6.58 | . |
| VS 8670-2005 | 1.3 | 5.3 | 1.1 | . | . | 82 | 12 | 0.3 | 1.4 | 8.4 | 89 | 47 | . | 15 | 20.7 | . | 80 | (0.015) |
| JGb-2 | . | 0.25 | . | . | . | 1.5 | . | 0.062 | 0.42 | 1.9 | 1.8 | 13.6 | . | 1.5 | . | . | 2.9 | . |
| JGb-1 | 1.01 | 0.88 | 0.33 | . | . | 3.60 | 4.59 | 0.15 | 0.59 | 3.34 | 5.47 | 25.4 | . | 1.92 | 1.13 | . | 6.87 | 0.1910 |
| CGL 013 | . | (0.32) | (0.16) | . | . | (1.31) | (4.89) | (0.06) | (0.5) | (0.36) | (2.33) | 23.34 | . | 4.68 | (0.5) | . | (1.96) | . |
| VS 2117-81 | 2.1 | . | . | . | . | . | 3.3 | . | 2.0 | . | . | 28 | . | 6 | . | . | . | 0.1240 |
| GBW 07112 | 1.06 | 0.65 | 0.20 | 0.08 | 0.12 | 1.71 | 1.94 | 0.06 | . | 9.3 | 4.10 | 69 | . | . | 0.84 | . | . | 0.37 |
| CAN WMG-1A | . | . | . | . | . | 8.47 | (44.7) | (0.196) | 2.49 | (5.26) | 9.41 | 2480 | 0.484 | (9.2) | (2.220) | 0.899 | (2.53) | 3.43 |

| Number | Sc | Se | Sm | Sn | Sr% | Ta | Tb | Te | Th | Tl | Tm | U | V | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 51-2009 | 12.33 | . | . | . | 0.1196 | . | . | . | . | . | . | . | 85.28 | 5.14 | . | 59.87 | (33.49) |
| VS 8670-2005 | 26 | . | 17 | 3.2 | 0.224 | 0.5 | 1.5 | . | 8 | . | (0.35) | 1.8 | 250 | 30 | 2.5 | 120 | 219 |
| JGb-2 | 27 | . | 0.51 | . | 0.0438 | 0.29 | 0.15 | . | 0.19 | . | . | . | 174 | 4.5 | 0.39 | 48.5 | 11.6 |
| JGb-1 | 35.8 | . | 1.49 | 0.48 | 0.0327 | 0.18 | 0.29 | . | 0.48 | . | 0.16 | 0.13 | 635 | 10.4 | 1.06 | 109 | 32.8 |
| CGL 013 | 39.66 | . | (0.72) | . | 0.0778 | . | (0.13) | . | . | . | (0.05) | . | 420 | 4.30 | (0.39) | 98.00 | (12) |
| VS 2117-81 | 37 | . | . | 6.5 | 0.1040 | . | . | . | . | . | . | . | 960 | . | 2.6 | 136 | . |
| GBW 07112 | 22.5 | 0.26 | 1.22 | 0.89 | 0.0612 | . | 0.20 | 0.010 | . | 0.07 | 0.09 | . | 768 | 4.9 | 0.36 | 118 | 29 |
| CAN WMG-1A | 21.33 | 14.1 | 2.211 | (1.91) | 0.00390 | (0.355) | . | (1.19) | 1.07 | . | (0.192) | (0.65) | 158 | 12.67 | (1.220) | 112 | 35.7 |

## CRM GOLD ORE

ng/g (ppb) 10g or 1kg

| Number | Au |
|---|---|
| GLG919-2 | 635.73 |
| GLG321-2 | 329.99 |
| GLG322-1 | 327.84 |
| GLG320-1 | 322.15 |
| GLG321-5 | 315.63 |
| GLG920-3 | 276.79 |
| GLG318-1 | 259.04 |
| GLG319-3 | 238.19 |
| GLG922-2 | 231.81 |
| GLG313-3 | 227.70 |
| GLG912-5 | 224.34 |
| GLG917-3 | 222.13 |
| GLG318-3 | 214.41 |
| GLG911-5 | 209.21 |
| GLG904-4 | 204.08 |
| GLG322-2 | 202.03 |
| GLG322-3 | 199.16 |
| GLG315-5 | 194.82 |
| GLG317-2 | 189.86 |
| GLG313-4 | 183.83 |
| GLG921-4 | 160.65 |
| GLG922-1 | 158.89 |
| GLG317-1 | 151.88 |
| GLG316-2 | 150.84 |
| GLG920-2 | 138.05 |
| GLG921-3 | 127.92 |
| GLG304-4 | 121.43 |
| GLG919-1 | 120.71 |
| GLG314-3 | 103.11 |
| GLG314-5 | 95.23 |
| GLG319-4 | 99.13 |
| GLG317-3 | 94.60 |
| GLG323-3 | 84.99 |
| GLG922-3 | 83.98 |
| GLG922-4 | 83.56 |
| GLG313-5 | 83.36 |
| GLG310-5 | 79.83 |
| GLG919-3 | 76.60 |
| GLG320-2 | 66.38 |
| GLG323-5 | 59.61 |
| GLG305-3 | 55.48 |
| GLG320-3 | 52.09 |
| GLG319-5 | 44.93 |
| GLG919-5 | 34.78 |
| GLG910-3 | 32.02 |
| GLG322-5 | 30.91 |
| GLG920-1 | 28.01 |
| GLG319-1 | 25.63 |
| GLG321-1 | 24.31 |
| GLG913-2 | 22.75 |
| GLG921-5 | 21.48 |
| GLG312-1 | 20.65 |
| GLG323-4 | 19.69 |
| GLG321-4 | 19.52 |
| GLG920-5 | 18.89 |
| GLG920-4 | 16.60 |
| GLG922-5 | 14.95 |
| GLG915-1 | 14.01 |
| GLG919-4 | 11.32 |
| GLG322-4 | 10.96 |
| GLG901-2 | 9.92 |
| GLG912-1 | 6.86 |
| GLG910-4 | 6.36 |
| GLG916-1 | 5.06 |
| GLG911-4 | 4.65 |
| GLG910-1 | 4.89 |
| GLG921-1 | 4.65 |
| GLG921-2 | 4.37 |
| GLG321-3 | 4.28 |
| GLG907-1 | 4.18 |
| GLG912-3 | 3.98 |
| GLG904-1 | 3.82 |
| GLG911-3 | 3.74 |
| GLG914-2 | 3.68 |
| GLG314-1 | 3.63 |
| GLG316-5 | 3.50 |
| GLG916-2 | 3.48 |
| GLG916-3 | 3.45 |
| GLG323-2 | 3.43 |
| GLG916-4 | 3.27 |
| GLG302-4 | 3.23 |
| GLG913-4 | 3.10 |
| GLG318-2 | 3.03 |
| GLG314-2 | 2.98 |
| GLG323-1 | 2.88 |
| GLG913-3 | 2.81 |
| GLG312-2 | 2.78 |
| GLG320-4 | 2.76 |
| GLG316-3 | 2.75 |
| GLG910-5 | 2.58 |
| GLG912-2 | 2.54 |
| GLG319-2 | 2.50 |

## CRM GOLD ASSAY PILLS

25 x 1g pressed powder

| Number | Au mg/kg (ppm) |
|---|---|
| GAP-06 | 2.2202 |
| GAP-03 | 1.0000 |
| GAP-05 | 0.5249 |
| GAP-01 | 0.3237 |
| GAP-04 | 0.2117 |
| GAP-02 | 0.1025 |
| GAP-07 | 0.0304 |

## RM GOLD ORE

g/t = mg/kg = ppm 1 kg, last

| Number | Au | Pd* | Pt* |
|---|---|---|---|
| CDN GS-50 | 50.5 | . | . |
| CDN GS-20A | 21.12 | . | . |

## CRM 17034 GOLD ORE

| Number | Au (mg/kg) | Units |
|---|---|---|
| IMS-261 | 7.03 | Powder 1 kg |
| IMS-247 | 4.24 | Powder 1 kg |
| IMS-231 | 3.43 | Powder 1 kg |
| IMS-230 | 2.19 | Powder 1 kg |
| IMS-237 | 2.06 | Coarse Material 500 g |
| IMS-267 | 2.00 | Powder 1 kg |
| IMS-266 | 1.03 | Powder 1 kg |
| IMS-255 | 0.89 | Powder 1 kg |
| IMS-227 | 0.82 | Powder 1 kg |
| ~~IMS-236~~ | ~~0.72~~ | ~~Coarse Material 500 g~~ |
| IMS-226 | 0.61 | Powder 1 kg |
| IMS-265 | 0.31 | Powder 1 kg |
| ~~IMS-235~~ | ~~0.23~~ | ~~Coarse Material 500 g~~ |
| IMS-225 | 0.21 | Powder 1 kg |

## CRM GOLD ORE

mg/kg (ppm) 10g or 1kg

| Number | Au Fire Assay | |
|---|---|---|
| G915-10 | 48.68 | |
| G310-10 | 48.53 | last 1kg |
| G306-6 | 48.53 | |
| G914-8 | 33.30 | |
| G915-8 | 24.72 | |
| G917-2 | 24.36 | |
| G916-5 | 19.92 | |
| G917-8 | 17.12 | |
| G315-8 | 9.93 | |
| G915-9 | 9.82 | |
| G310-8 | 7.97 | |
| G307-7 | 7.87 | |
| G313-7 | 6.93 | |
| G316-8 | 6.11 | |
| G316-7 | 5.85 | |
| G312-9 | 5.84 | |
| G314-5 | 5.29 | |
| G917-4 | 5.10 | |
| G310-1 | 4.94 | |
| G316-10 | 4.65 | |
| G915-1 | 4.56 | |
| G916-7 | 4.51 | |
| G306-7 | 4.50 | |
| G398-10 | 4.07 | |
| G910-3 | 4.02 | |
| G397-6 | 3.95 | |
| G905-7 | 3.92 | |
| G900-4 | 3.76 | |
| G913-5 | 3.70 | |
| G911-8 | 3.65 | |
| G307-1 | 3.37 | |
| G917-10 | 3.33 | |
| G310-9 | 3.29 | last 1kg |
| G900-5 | 3.21 | |
| G305-8 | 3.14 | |
| G910-6 | 3.09 | |
| G998-10 | 3.05 | |
| G916-10 | 2.81 | |
| G914-1 | 2.57 | |
| G912-2 | 2.51 | |
| G914-2 | 2.48 | |
| G308-8 | 2.45 | |
| G314-7 | 2.45 | |
| G305-5 | 2.43 | |
| G313-8 | 2.43 | |
| G322-4 | 2.43 | |
| G322-4 | 2.43 | |
| G911-4 | 2.43 | |
| G312-6 | 2.42 | |
| G913-2 | 2.40 | |
| G913-7 | 2.31 | |
| G913-6 | 2.19 | |
| G912-3 | 2.09 | |
| G313-2 | 2.04 | |
| G313-4 | 2.00 | |
| G300-10 | 1.99 | |
| G307-8 | 1.99 | |
| G916-2 | 1.98 | |
| G999-9 | 1.98 | |

Number Au Fire Assay

## CRM GOLD ORE

mg/kg (ppm) 10g or 1kg

| Number | Au Fire Assay |
|---|---|
| G316-9 | 1.75 |
| G916-1 | 1.72 |
| G312-5 | 1.60 |
| G311-8 | 1.57 |
| G300-9 | 1.53 |
| G314-9 | 1.52 |
| G910-9 | 1.51 |
| G307-4 | 1.40 |
| G316-6 | 1.40 |
| G911-3 | 1.37 |
| G913-4 | 1.37 |
| G311-5 | 1.32 |
| G911-10 | 1.30 |
| G308-6 | 1.28 |
| G914-3 | 1.24 |
| G316-2 | 1.04 |
| G314-8 | 1.03 |
| G315-9 | 1.02 |
| G310-5 | 1.01 |
| G315-2 | 0.98 |
| G910-10 | 0.97 |
| G910-2 | 0.90 |
| G399-5 | 0.87 |
| G917-6 | 0.76 |
| G911-7 | 0.72 |
| G310-6 | 0.65 |
| G322-2 | 0.65 |
| G910-8 | 0.63 |
| G912-8 | 0.53 |
| G916-4 | 0.51 |
| G322-1 | 0.34 |
| G322-3 | 0.33 |
| G311-3 | 0.27 |
| G316-4 | 0.24 |
| G311-6 | 0.22 |
| G316-3 | 0.21 |
| G911-5 | 0.20 |
| G911-6 | 0.17 |
| G315-5 | 0.10 |
| G310-3 | 0.07 |

Number Au Fire Assay

## CRM GOLD ORE

analysis listed in mg/kg (ppm) except % which is mass 10g or 200g units

| Number | Au Fire | Au Aqua | Ag | As | Co | Cu | Ni | Pb | S% | Zn |
|---|---|---|---|---|---|---|---|---|---|---|
| GBMS623-4 | 17.95 | 17.29 | 49.9 | 1263 | 106 | 22728 | 196 | 9476 | 3.88 | 19340 |
| GBMS623-3 | 5.85 | 5.46 | 3.7 | 570 | 332 | 10792 | 77 | 322 | 5.16 | 35 |
| GBMS304-4 | 5.67 | 5.29 | 3.4 | 535 | . | 9786 | 732 | 271 | 6.27 | 149 |
| GBMS623-2 | 3.13 | 2.93 | 6.9 | 450 | 55 | 3422 | 265 | 241 | 1.18 | 583 |
| GBMS911-2 | 2.88 | 2.82 | 1.24 | 62 | 78 | 1417 | 34 | 47 | 1.30 | 122 |
| GBMS304-3 | 2.68 | 2.51 | 1.5 | 263 | 137 | 3637 | 376 | 159 | 2.35 | 143 |
| GBMS304-5 | 1.62 | 1.59 | 0.8 | 99 | 68 | 2293 | 21 | 65 | 1.04 | 13 |
| GBMS911-3 | 1.33 | 1.31 | 0.17 | 13 | 31 | 7652 | 27 | 37 | 0.99 | 196 |
| GBMS911-1 | 1.04 | 1.04 | 1.19 | 335 | 31 | 10028 | 23 | 5844 | 1.40 | 1221 |

Fire = Fire Assay, Aqua = Aqua Regia

## CRM GOLD ORE

analysis lsited in mass % except * which is mg/kg for U, M = /ICP and X = XRF D = Demsotu/Specific Gravity

| Number | Au* | $Al_2O_3$ | CaO | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | S | $SiO_2$ | $TiO_2$ | U M | LOI | D | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~AMIS 0429~~ | ~~22.93~~ | ~~.~~ | ~~0.48~~ | ~~(0.11)~~ | ~~4.97~~ | ~~0.54~~ | ~~.~~ | ~~(0.04)~~ | ~~.~~ | ~~1.57~~ | ~~87.70~~ | ~~.~~ | ~~0.0722~~ | ~~(1.87)~~ | ~~.~~ | ~~100 g~~ |
| AMIS 0430 | 2.68 | 2.80 | 0.19 | 0.12 | 2.03 | 0.32 | (0.11) | 0.030 | (0.06) | 0.33 | 92.3 | (0.14) | 0.0113 | (1.66) | 2.71 | 100 g |

## CRM GOLD AND SILVER ORE

analysis listed in mg/kg (ppm) * and mass percent %

| Number | Ag* | Au* | As% | S% | Sb% | Units | |
|---|---|---|---|---|---|---|---|
| NCS DC28104 | 62.2 | 63.4 | . | . | . | 250 g | |
| CGL 205 | 21.48 | 10.72 | . | . | . | 250 g | |
| USZ 29-2000 | 6.05 | 42.26 | . | . | . | 100 or 200 g | |
| VS 5938-91 | 6.5 | 36 | 8.45 | 28.73 | 0.021 | 100 g | |
| VS 5937-91 | 6.4 | 33 | 7.78 | 25.83 | 0.019 | 100 g | |
| ~~VS 2739-83~~ | ~~5.7~~ | ~~34~~ | ~~8.0~~ | ~~26.0~~ | ~~0.020~~ | ~~100 g~~ | |
| NCS DC28107 | 20.4 | 20.0 | . | . | . | 250 g | |
| NCS DC29103 | 18.0 | 20.0 | . | . | . | 500 g | |
| CAN MA-1b | (4) | 17.0 | . | . | . | 200 g | |
| VS 5936-91 | 3.5 | 20 | 4.72 | 15.26 | 0.012 | 100 g | |
| VS 5935-91 | 23 | 13 | . | 15.10 | 0.044 | 100 g | |
| NCS DC28106 | 11.0 | 11.0 | . | . | . | 500 g | |
| USZ 39-2005 | 49.33 | 10.92 | . | . | . | 250 g | |
| VS 5934-91 | 1.8 | 8.9 | 2.11 | 6.77 | 0.0057 | 100 g | |
| CAN MA-3a | (2.4) | 8.56 | . | . | . | 200 g | |
| USZ 40-2005 | 27.06 | 7.38 | . | . | . | 100 or 250 g | |
| USZ 30-2000 | 1.18 | 5.92 | . | . | . | 250 g | |
| NCS DC28105 | 5.8 | 5.0 | . | . | . | 500 g | |
| VS 5933-91 | 1.1 | 4.6 | 1.08 | 3.35 | 0.0039 | 100 g | |
| NCS DC29102 | 37.4 | 4.30 | . | . | . | 500 g | |
| VS 8815-2006 | 0.75 | 4.25 | 1.000 | 3.27 | 0.00260 | 100 g | |
| USZ 31-2000 | 1.07 | 3.28 | . | . | . | 250 g | |
| CAN MA-2c | (0.51) | 3.02 | . | . | . | 400 g | |
| VS 5932-91 | 0.9 | 3.0 | 0.54 | 1.77 | 0.0021 | 100 g | |
| NCS DC28102b | 7.4 | 2.5 | . | . | . | 500 g | |
| VS 8816-2006 | 0.360 | 2.13 | 0.500 | 1.64 | 0.00135 | 100 g | |
| NCS DC28103 | 3.1 | 1.8 | . | . | . | 500 g | |
| NCS DC28101 | 4.2 | 1.7 | . | . | . | 500 g | |
| USZ 21-98 | . | 1.06 | . | . | . | 250 g | |
| VS 2740-83 | 0.31 | 0.9 | 0.17 | 0.38 | 0.0019 | 100 g | last |
| NCS DC29101 | . | 0.64 | . | . | . | 500 g | |
| VS 5940-91 | 0.9 | 0.55 | 0.063 | 0.34 | 0.0075 | 100 g | |
| VS 5939-91 | 0.7 | 0.37 | . | 0.24 | 0.0025 | 100 g | |
| SRM 886 | . | 8.25 | . | 1.466 | . | 200 g | |
| KZ 63-86 | . | 0.023 | . | . | . | 100 g | |
| NCS DC90006 | 732 | . | . | . | . | 50 g | |
| NCS DC90005 | 559 | . | . | . | . | 50 g | |
| NCS DC90004 | 446 | . | . | . | . | 50 g | |
| NCS DC90003 | 298 | . | . | . | . | 50 g | |
| NCS DC29106 | 199 | . | . | . | . | 50 g | |
| NCS DC29105 | 138.1 | . | . | . | . | 50 g | |
| NCS DC90002 | 112 | . | . | . | . | 50 g | |
| NCS DC29104 | 50.3 | . | . | . | . | 50 g | |
| NCS DC90001 | 46.9 | . | . | . | . | 50 g | |
| Number | Ag* | Au* | As% | S% | Sb% | Units | |

## CRM GOLD AND SILVER ORE

minesite carbon material

data listed in mg/kg (ppm) 10 g units

| Number | Au | Ag | |
|---|---|---|---|
| GLC302-3 | 7467 | 1248 | last of stock |
| GLC323-2 | 4998 | 2410 | |
| GLC323-1 | 4293 | 1825 | |
| GLC922-1 | 3239 | 1581 | |
| GLC323-3 | 3175 | 415 | |
| GLC920-2 | 3161 | 473 | |
| GLC921-1 | 2448 | 171 | |
| GLC314-1 | 2031 | 947 | last of stock |
| GLC922-3 | 1984 | 993 | |
| GLC922-2 | 1102 | 558 | |
| GBC319-4 | 808 | 225 | |
| GBC323-2 | 789 | 225 | |
| GBC917-2 | 770 | 219 | |
| GBC323-1 | 713 | 208 | |
| GBC321-2 | 713 | 207 | |
| GBC917-3 | 628 | 195 | |
| GBC922-3 | 546 | 225 | |
| GBC323-3 | 475 | 67 | |
| GBC911-3 | 470 | 596 | last of stock |
| GBC902-3 | 285 | 83 | last of stock |
| GBC314-1 | 51 | 38 | last of stock |
| GBC922-2 | 19 | 34 | |
| Number | Au | Ag | |

## RM GOLD AND SILVER ORE

data in mg/kg (ppm) 100 g, last

| Number | Au | Ag |
|---|---|---|
| CDN GS-1Q | 1.24 | 40.7 |

## RM GOLD AND SILVER ORE

analysis listed in mg/kg (ppm) 1 kg, last

| Number | Ag | Au | Au |
|---|---|---|---|
| CDN GS-8C | . | 8.59 FA/Inst | 8.62 FA/Grav |

## CRM GOLD AND SILVER ORE - CONTINUED ON THE NEXT PAGES

analysis listed in mass % except * which is mg/kg OREAS samples list multiple methods, more information upon request

| Number | Au* | Ag* | As | Ba | Cu | Fe | $Fe_2O_3$ | Pb | S | $SO_3$ | Sb | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN DS-1 | 32.59 | 0.47 | 0.6960 | 0.0221 | 0.00271 | (3.0) | . | 0.00138 | (2.609) | . | (0.0107) | 0.0206 | (13) |
| USZ 38-2005 | 31.28 | . | . | 0.02 | 0.43 | . | 14.71 | . | . | . | . | 0.006529 | 2.59 |
| USZ 20-98 | 10.05 | 3.05 | . | . | . | . | 1.92 | . | . | . | . | . | 0.95 |
| KZ 3597-86 | 8.8 | . | 3.96 | . | . | . | . | . | . | . | . | . | . |
| UNS AuM | 2.5 | . | 0.08765 | BaO:0.066 | 0.00359 | . | 5.55 | . | . | . | . | . | . |
| USZ 41-2006 | 0.91 | . | . | 0.0249 | 0.75 | . | . | 0.0027 | . | 3.87 | . | 0.0136 | 5.43 |
| CAN CH-4 | 0.88 | 2.1 | 0.00088 | (0.0425) | 0.20 | 5.42 | . | . | 0.63 | . | 0.77 | 0.020 | (0.9) |
| USZ 34-2002 | 0.79 | 1.7 | 0.12 | . | 0.001484 | 2.18T | . | 0.002 | . | . | 0.14 | 0.0025 | 2.84 |
| US DGPM-1 | 0.73 | . | 0.0180 | . | . | . | 1.92 | . | . | . | 0.0014 | . | . |
| USZ 35-2002 | 0.57 | 1.25 | . | . | . | . | . | . | . | . | . | . | . |
| KZ 6585-93 | 0.28 | 11.6 | 0.075 | . | 0.064 | . | . | 0.12 | . | . | . | 0.60 | . |
| CAN GTS-2a | 0.272 | (0.64) | 0.0124 | 0.0186 | 0.00886 | 7.56 | . | . | 0.348 | . | (0.000133) | 0.0208 | (9.87) |
| OREAS 24b | <0.003 | . | (0.00100) | BaO:0.0819 | . | . | 6.35 | . | 0.190 | . | . | (0.0113) | 2.46 |
| OREAS 24b 4 | . | (0.127) | (0.000835) | 0.0716 | 0.00380 | 4.39 | . | 0.00231 | 0.198 | . | 0.000100 | 0.0105 | . |
| OREAS 24b A | (0.002) | (0.058) | 0.000796 | 0.0146 | 0.00364 | 3.93 | . | 0.000923 | 0.200 | . | (0.000048) | 0.0093 | . |
| OREAS 24b F | . | (2.17) | (0.000974) | 0.0739 | (0.00351) | 4.45 | . | (0.00229) | 0.203 | . | (0.000133) | (0.0103) | . |
| OREAS 22d | <0.001 | <0.1 | <0.0001 | 0.000617 | 0.000923 | 0.468 | . | 0.000072 | (<0.01) | . | 0.000021 | 0.000670 | . |
| Number | Au* | Ag* | As | Ba | Cu | Fe | $Fe_2O_3$ | Pb | S | $SO_3$ | Sb | Zn | LOI |

## CRM 17034 GOLD ORE

anlalysis in mg/kg 60 g units

| Number | Au | Pd | Pt |
|---|---|---|---|
| IMS-328 | 16.80 | . | . |
| IMS-330 | 7.75 | . | . |
| IMS-333 | 2.99 | . | . |
| IMS-334 | 1.45 | . | . |
| IMS-348 | 1.00 | 0.41 | 0.42 |
| IMS-336 | 0.61 | 0.094 | 0.094 |
| IMS-349 | 0.0082 | 0.0026 | 0.0025 |
| IMS-401 | 0.0002 | <0.0002 | <0.0005 |

## CRM GOLD AND SILVER ORE - CONTINUED FROM THE PREVIOUS AND ON TO THE NEXT PAGE

analysis listed in mass % except * which is mg/kg OREAS samples list multiple methods, more information upon request

| Number | Al | $Al_2O_3$ | C | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN DS-1 | 4.48 | . | (3.126) | (6.248) | . | (1.1) | . | 2.76 | . | 0.0437 | . | . | . | 0.0340 | . | (25.68) | . | . | . |
| USZ 38-2005 | . | 2.03 | . | . | 0.56 | . | 0.64 | . | 1.01 | . | 0.03 | . | 0.17 | . | 0.05 | . | 77.37 | . | 0.15 |
| USZ 20-98 | . | 1.70 | . | . | 0.77 | . | 0.37 | . | . | . | 0.025 | . | 0.07 | . | 0.037 | . | 92.57 | . | 0.08 |
| KZ 3597-86 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| UNS AuM | . | 14.06 | . | . | 4.09 | . | 1.92 | . | 1.81 | . | 0.082 | . | 3.08 | . | . | . | 66.15 | . | 0.39 |
| USZ 41-2006 | . | 14.58 | . | . | 3.14 | . | 2.81 | . | 5.52 | . | 0.12 | . | 2.36 | . | 0.27 | . | 52.09 | . | 0.93 |
| CAN CH-4 | 7.73 | . | 0.12 | 1.96 | . | 1.81 | . | 1.43 | . | 0.043 | . | 3.26 | . | 0.061 | . | . | 63.10 | 0.31 | . |
| USZ 34-2002 | . | 4.79 | . | . | 2.53 | . | 1.48 | . | 0.37 | . | 0.017 | . | 0.055 | . | 0.125 | . | 84.70 | . | 0.17 |
| US DGPM-1 | . | 9.56 | . | . | (0.22) | . | 2.74 | . | (0.56) | . | . | . | . | . | . | . | 79.82 | . | . |
| USZ 35-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| KZ 6585-93 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| CAN GTS-2a | 6.96 | . | 2.011 | 4.01 | . | 2.021 | . | 2.412 | . | 0.1510 | . | 0.617 | . | 0.0892 | . | 23.65 | . | (0.5*) | . |
| OREAS 24b | . | 15.15 | 0.189 | . | 1.47 | . | 3.39 | . | 2.75 | . | 0.059 | . | 1.15 | . | 0.161 | . | 66.0 | . | 0.798 |
| OREAS 24b 4 | 8.02 | . | . | 1.08 | . | 2.81 | . | 1.65 | . | 0.044 | . | 0.846 | . | 0.069 | . | . | . | 0.468 | . |
| OREAS 24b A | 3.15 | . | . | 0.461 | . | 1.17 | . | 1.36 | . | 0.035 | . | 0.108 | . | (0.062) | . | . | . | 0.198 | . |
| OREAS 24b F | 7.81 | . | . | 1.06 | . | 2.74 | . | 1.62 | . | 0.046 | . | 0.824 | . | (0.073) | . | 31.12 | . | 0.481 | . |
| OREAS 22d | 0.132 | . | . | (0.010) | . | (0.008) | . | (0.009) | . | 0.011 | . | (0.009) | . | (0.001) | . | . | . | 0.021 | . |
| Number | Al | $Al_2O_3$ | C | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | Si | $SiO_2$ | Ti | $TiO_2$ |

## CRM GOLD AND SILVER ORE - CONTINUED FROM THE PREVIOUS AND ON TO THE NEXT PAGE

analysis listed in mg/kg except % which is mass % OREAS samples list multiple methods, more information upon request

| Number | B | Be | Bi | Cd | Ce | Co | Cr | $Cr_2O_3$ | Cs | Dy | Er | Eu | Ga | Gd | Ge | Hf | Hg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN DS-1 | . | (0.819) | (0.1) | (0.98) | (40) | 9.5 | (59) | . | (7) | . | . | (1) | (10) | . | . | (4) | 82 |
| USZ 38-2005 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 20-98 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| KZ 3597-86 | 1.08% | . | . | . | . | 0.17% | . | . | . | . | . | . | . | . | . | . | . |
| UNS AuM | . | . | . | . | . | . | 47 | . | . | . | . | . | 12.9 | . | . | . | . |
| USZ 41-2006 | . | . | . | . | . | 24.3 | 99.3 | . | . | . | . | . | . | . | . | . | . |
| CAN CH-4 | . | . | . | 1.14 | . | 26 | 114 | . | . | . | . | . | . | . | . | . | . |
| USZ 34-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| US DGPM-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 35-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| KZ 6585-93 | . | . | . | 96 | . | . | . | . | . | . | . | . | . | . | . | . | . |
| CAN GTS-2a | . | . | . | (0.58) | . | 22.1 | (270) | . | . | . | . | . | . | . | . | . | . |
| OREAS 24b | . | . | . | . | . | (28.3) | . | 201 | . | . | . | . | . | . | . | . | . |
| OREAS 24b 4 | . | 2.92 | 0.68 | (0.049) | 84 | 16.9 | 118 | . | 10.7 | (4.47) | (2.54) | (1.36) | 20.1 | (6.02) | (0.83) | 3.90 | . |
| OREAS 24b A | (6.23) | (1.65) | 0.73 | (0.046) | (61) | 15.7 | 106 | . | 9.15 | (2.65) | (1.21) | (0.66) | 10.8 | (3.96) | (0.26) | (0.52) | . |
| OREAS 24b F | (69) | 2.95 | (1.03) | . | 86 | 16.9 | 142 | . | 10.5 | 5.83 | 3.41 | 1.39 | 20.2 | 6.27 | (1.64) | 6.15 | . |
| OREAS 22d | . | (0.066) | <0.1 | <0.1 | (2.43) | 0.85 | (11.9) | . | (0.10) | (0.15) | (<0.1) | (<0.05) | (0.26) | (0.20) | (0.065) | 0.22 | . |
| Number | B | Be | Bi | Cd | Ce | Co | Cr | $Cr_2O_3$ | Cs | Dy | Er | Eu | Ga | Gd | Ge | Hf | Hg |

## CRM GOLD AND SILVER ORE - CONTINUED FROM THE PREVIOUS AND ON TO THE NEXT PAGE

analysis listed in mg/kg except % which is mass % OREAS samples list multiple methods, more information upon request

| Number | Ho | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pd | Pr | Pt | Rb | Re | Sc | Se | Sm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN DS-1 | . | (0.5) | (20) | (20) | . | . | . | . | 48.7 | . | . | . | . | . | . | . | . |
| USZ 38-2005 | . | . | . | . | . | 0.11% | . | . | 28.27 | . | . | . | . | . | . | . | . |
| USZ 20-98 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| KZ 3597-86 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| UNS AuM | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 41-2006 | . | . | . | . | . | 51.8 | . | . | 25.4 | . | . | . | . | . | . | . | . |
| CAN CH-4 | . | . | . | . | . | . | . | . | 51 | . | . | . | . | . | . | 2.1 | . |
| USZ 34-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| US DGPM-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 35-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| KZ 6585-93 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| CAN GTS-2a | . | . | . | . | . | . | . | . | 77.1 | . | . | . | . | . | . | . | . |
| OREAS 24b | . | . | . | . | . | . | . | . | (59) | <0.001 | . | <0.001 | . | . | . | . | . |
| OREAS 24b 4 | (0.80) | (0.077) | 42.4 | 52 | (0.32) | 4.03 | 14.6 | (36.2) | 60 | . | (9.86) | . | 164 | (0.002) | 15.3 | (0.66) | (7.06) |
| OREAS 24b A | (0.46) | (0.048) | (29.2) | 45.6 | (0.20) | 3.86 | (0.31) | (24.6) | 57 | (<0.01) | (6.87) | (0.001) | 114 | (<0.001) | 9.51 | (0.42) | (4.68) |
| OREAS 24b F | 1.17 | . | 44.0 | 52 | 0.49 | (4.91) | 16.0 | 38.7 | 61 | . | 10.2 | . | 161 | (<0.1) | 14.1 | . | 7.17 |
| OREAS 22d | (<0.05) | (<0.005) | (1.20) | 14.2 | (0.013) | 2.36 | 0.88 | (1.03) | 4.38 | (<0.005) | (0.32) | (<0.005) | 0.54 | (<0.002) | (0.20) | (<1) | (0.22) |
| Number | Ho | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pd | Pr | Pt | Rb | Re | Sc | Se | Sm |

## CRM GOLD AND SILVER ORE - CONTINUED FROM THE PREVIOUS PAGES

analysis listed in mg/kg except % which is mass % OREAS samples list multiple methods, more information upon request

| Number | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | W | Y | Yb | Zr | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN DS-1 | . | . | . | . | . | . | 20 | . | . | . | . | . | . | 400 g | |
| USZ 38-2005 | . | 88.71 | . | . | . | . | . | . | . | 0.01% | . | . | . | 250 g | |
| USZ 20-98 | . | . | . | . | . | . | . | . | . | . | . | . | . | 250 g | last of stock |
| KZ 3597-86 | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | last of stock |
| UNS AuM | . | 187.7 | . | . | . | . | . | . | . | . | 14.2 | . | 81 | 200 g | |
| USZ 41-2006 | . | 259 | . | . | . | . | . | . | . | . | . | . | 78.3 | 100 g | |
| CAN CH-4 | . | (209) | . | . | . | . | . | . | . | . | . | . | . | 200 g | |
| USZ 34-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | 250 g | $H_2O$: 0.10- |
| US DGPM-1 | . | . | . | . | . | . | . | . | . | (76) | . | . | . | 200 g | last of stock |
| USZ 35-2002 | . | . | . | . | . | . | . | . | . | . | . | . | . | 250 g | |
| KZ 6585-93 | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| CAN GTS-2a | . | 92.8 | . | . | . | 1.244 | . | . | . | . | . | . | . | 350 g | |
| OREAS 24b | . | (134) | . | . | . | . | . | . | . | . | . | . | . | 60 g last of stock Cl:(<10ppm) | |
| OREAS 24b 4 | 4.25 | 124 | 1.23 | (0.87) | . | 16.4 | 0.86 | (0.31) | 3.06 | 3.64 | 19.9 | (2.17) | 134 | " 4 acid digestion, **GRANODIORITE** | |
| OREAS 24b A | 2.26 | (29.0) | . | (0.54) | . | 14.3 | 0.66 | (0.17) | 1.74 | (1.19) | 12.3 | (1.15) | 24.5 | " aqua regia | |
| OREAS 24b F | 4.65 | 125 | 1.32 | 0.98 | . | 16.5 | 0.91 | 0.50 | 3.31 | 4.13 | 32.5 | 3.24 | 213 | " fusion ICP-OES/MS | |
| OREAS 22d | 0.61 | (1.14) | (0.036) | (<0.05) | (<0.05) | 0.67 | (<0.02) | (<0.05) | 0.18 | 0.21 | 0.69 | (<0.1) | 7.02 | 10 g | V: 2.63 last then 22e |
| Number | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | W | Y | Yb | Zr | Units | Other |

## GRANITE WITH EXTENSIVE ANALYSIS

analysis listed in mass % IAG: RM all others: CRM

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | F | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-2 | 76.83 | 12.47 | . | 0.70 | (0.0972) | 0.57 | 0.33 | 0.97 | +0.33 -0.12 | 4.71 | 0.037 | 0.016 | 3.54 | 0.002 | 0.044 | . |
| SARM 1 | 75.70 | 12.08 | (0.10) | 0.78 | 0.42 | 1.30 | (0.6) | 2.00 | 0.49 | 4.99 | (0.06) | . | 3.36 | . | (0.09) | . |
| VS 3333-85 | 74.76 | 10.64 | (0.1) | 0.32 | 0.062 | 1.61 | 4.50 | . | (0.30) | 4.64 | 0.10 | 0.120 | 4.24 | 0.024 | 0.26 | . |
| IAG OU-3 | 74.09 | 11.10 | 1.913 | 0.2 | 0.1100 | 3.255 | . | 3.8341 | . | 4.55 | . | 0.090 | 3.678 | . | 0.224 | 1.815 |
| GUW GM | 73.42 | 13.55 | 0.28 | 1.07 | 0.067 | 1.13 | 2.01 | . | 0.35 | 4.76 | 0.37 | 0.043 | 3.78 | 0.062 | 2.12 | . |
| USZ 47-2008 | 72.37 | 14.07 | . | 1.15 | . | 1.81 | 2.44 | . | . | 4.68 | 0.38 | 0.06 | 3.63 | 0.13 | 0.30 | 0.64 |
| USZ 28-99 | 71.61 | 16.13 | . | 0.39 | 1.25 | 0.29 | | 0.51 | -(0.05) | 3.52 | (0.29) | 0.13 | 5.25 | 0.028 | (0.03) | 1.14 |
| SARM 48 | 67.11 | 11.24 | . | 8.90 | . | (0.2) | 0.58 | . | . | 4.26 | 0.18 | 0.02 | 3.22 | (0.09) | 0.10 | . |
| NCS DC73376 | 66.27 | 16.33 | 0.35 | 2.66 | 0.0670 | (1.6) | . | 3.12 | (1.0) | 2.60 | 1.63 | . | 5.3 | . | . | 1.28 |

continued analysis listed in mg/kg except % which is mass % and * which is ng/g

| Number | Ag | Al% | As | B | Ba | Be | Bi | Ca% | Cd | Ce | Cl | Co | Cr | Cs | $Cs_2O$% | Cu | Dy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-2 | (0.019) | 6.60 | (0.68) | (1.78) | 81.0 | 3.26 | (0.64) | 0.50 | (0.004) | 48.3 | . | 3.62 | 6.37 | 6.79 | . | 0.49 | 10.5 |
| SARM 1 | . | . | . | . | (120) | . | . | . | . | 195 | . | . | 12 | . | . | 12 | (17) |
| VS 3333-85 | (0.06) | . | (4) | 11 | 90 | 5 | . | . | . | 90 | . | 1.3 | 3.1 | 4.5 | . | 12 | (10) |
| IAG OU-3 | . | . | 3.3793 | . | 28 | 10.94 | . | . | 0.38 | 196.3 | . | . | 18.61 | 0.66 | . | 3.3 | 18.87 |
| GUW GM | (0.09) | . | 4.1 | 11 | 340 | (4.8) | . | . | . | 65 | . | 3.7 | 11 | 8.1 | . | 13 | (5.4) |
| USZ 47-2008 | . | . | 2.28 | . | 350 | 8.63 | 1.03 | . | . | 64.38 | . | 2.71 | 182 | 17.02 | . | 7.36 | 4.42 |
| USZ 28-99 | . | . | (3) | . | . | . | . | . | . | (25) | . | . | (130) | . | 0.012 | 8 | . |
| SARM 48 | . | . | . | . | (290) | . | . | . | . | (850) | . | . | 23 | . | . | (10) | . |
| NCS DC73376 | 0.03 | . | (0.25) | 15 | 1140 | 1.7 | 0.096 | . | (0.06) | 48 | (120) | 7.8 | 24 | 2.6 | . | (3.1) | 1.52 |

| Number | Er | Eu | Fe% | Ga | Gd | Ge | Hf | Hg | Ho | In | K% | La | Li | $Li_2O$% | Lu | Mg% | Mn% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-2 | 6.04 | 0.10 | 0.68 | 18.6 | 8.01 | (1.70) | 4.73 | (0.0033) | 1.67 | . | 3.91 | 19.9 | 42.2 | . | 1.22 | 0.02 | 0.012 |
| SARM 1 | . | 0.35 | . | 27 | (14) | . | . | . | . | . | . | 109 | (12) | . | (2) | . | 0.0160 |
| VS 3333-85 | (6) | 0.4 | . | 27 | . | 2.2 | 12 | . | . | . | . | 45 | 52 | . | 0.9 | . | . |
| IAG OU-3 | 11.44 | 1.152 | . | 32.1 | 18.073 | 1.5 | 22.631 | . | 4.011 | . | . | 94.64 | 1.41 | . | 1.628 | . | . |
| GUW GM | (2.2) | 0.60 | . | 15 | (5.2) | (1.6) | 5.1 | (0.0033) | (1.0) | . | . | 41 | 50 | . | 0.40 | . | . |
| USZ 47-2008 | 2.37 | 0.58 | . | 22.80 | 4.95 | 1.50 | 4.75 | . | 0.85 | . | . | 29.59 | 124 | . | 0.35 | . | . |
| USZ 28-99 | . | . | . | . | . | . | . | . | . | . | . | (15) | . | 0.37 | . | . | . |
| SARM 48 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC73376 | 0.76 | 1.0 | . | 18.2 | 2.4 | 0.93 | 3.3 | 0.0035 | 0.27 | (0.03) | . | 25 | 24.7 | . | 0.11 | . | 0.0430 |

| Number | Mo | Na% | Nb | Nd | Ni | P% | Pb | Pr | Rb | $Rb_2O$% | S | Sb | Sc | Se | Si% | Sm | Sn | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-2 | 0.37 | 2.63 | 14.7 | 26.4 | (4.35) | 0.001 | 31.5 | 6.20 | 301 | . | (7.0) | (0.057) | 2.42 | . | 35.91 | 7.78 | 3.00 | 17.9 |
| SARM 1 | . | . | 53 | 72 | (8) | . | 40 | . | 325 | . | . | . | . | . | . | 15.8 | . | 10 |
| VS 3333-85 | 1.7 | . | 17 | 50 | 6 | . | 10 | . | 140 | . | (160) | (0.5) | 4.6 | . | . | 10 | 5 | 8 |
| IAG OU-3 | 1.975 | . | 80.2 | 87 | . | . | 36 | 22.7 | 171 | . | . | 0.3 | . | . | . | 18.71 | 11.45 | 11.2 |
| GUW GM | 1.1 | . | 18 | 30 | 6.8 | . | 30 | (7.2) | 260 | . | . | (0.51) | 4.8 | . | . | 4.9 | 4.4 | 133 |
| USZ 47-2008 | 3.06 | . | 15.22 | 27.10 | 5.76 | . | 24.81 | 7.27 | 275 | . | . | 0.19 | 4.36 | . | . | 5.54 | 13.30 | 111 |
| USZ 28-99 | . | . | 71 | . | 10 | . | 64 | . | . | 0.24 | . | . | (7) | . | . | . | . | . |
| SARM 48 | (5) | . | 202 | . | . | . | 135 | . | . | . | . | . | . | . | . | . | . | 29 |
| NCS DC73376 | (0.27) | . | 4.5 | 21 | 13 | 0.0570 | 7.6 | 5.8 | 57 | . | (50) | 0.063 | 5.0 | 0.019 | . | 3.3 | 0.8 | 690 |

| Number | Ta | Tb | Te | Th | Ti% | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-2 | 2.76 | 1.62 | . | 1.62 | 0.026 | 1.55 | 1.16 | 11.3 | 3.78 | 23.0 | 86.5 | 6.85 | 13.6 | 97.6 | 20 g |
| SARM 1 | . | 3.0 | . | 51 | 0.0540 | . | (2) | (15) | (2) | . | 143 | 14.2 | 50 | 300 | 100 g |
| VS 3333-85 | 1.1 | 0.4 | . | 80 | . | . | . | 1.8 | 6 | (1.1) | 60 | 7 | 140 | 470 | 100 g |
| IAG OU-3 | 5.748 | 3.081 | . | 22.845 | . | 0.735 | 1.731 | 5.5396 | . | . | 113.1 | 11.3 | 149.22 | 942 | ~35 g |
| GUW GM | 1.7 | 0.7 | . | 36 | . | . | . | 6.4 | 11 | 1.6 | 26 | 3.1 | 34 | 149 | 50 g |
| USZ 47-2008 | 2.56 | 0.79 | . | 19.35 | . | 1.72 | 0.37 | 5.44 | 14.03 | 0.56 | 25.19 | 2.36 | 54.59 | 169 | 100 g |
| USZ 28-99 | 54 | . | . | . | . | . | . | . | . | . | . | . | 0.086% | 46 | 100 g |
| SARM 48 | . | . | . | 113 | . | . | . | . | (8) | . | 436 | . | 53 | 300 | 100 g |
| NCS DC73376 | (0.34) | 0.29 | . | 1.9 | 0.1800 | (0.20) | 0.11 | (0.4) | 45 | 0.38 | 7.3 | 0.69 | 47 | (100) | 70 g |

## CRM GRANODIORITE WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | Al | $CO_2$ | CaO | Fe | FeO | $Fe_2O_3$ | T.$Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Si | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-1a | 72.30 | 14.30 | 7.57 | . | 2.13 | 1.40 | 1.36 | 0.51 | 2.00 | +0.59 -0.12 | 3.96 | 0.69 | 0.057 | 3.39 | 0.083 | 33.80 | 0.25 |
| JG-1 | 72.30 | 14.24 | 7.54 | . | 2.20 | 1.52 | 1.61 | 0.38 | 2.18 | +0.54 -0.07 | 3.98 | 0.74 | 0.063 | 3.38 | 0.099 | 33.80 | 0.26 |
| JG-3 | 67.29 | 15.48 | 8.19 | . | 3.69 | 2.58 | 1.83 | 1.62 | 3.69 | +0.67 -0.17 | 2.64 | 1.79 | 0.071 | 3.96 | 0.122 | 31.45 | 0.48 |
| ~~US GSP-2~~ | ~~66.6~~ | ~~14.9~~ | ~~7.88~~ | ~~.~~ | ~~2.10~~ | ~~3.43~~ | ~~.~~ | ~~.~~ | ~~4.90~~ | ~~.~~ | ~~5.38~~ | ~~0.96~~ | ~~.~~ | ~~2.78~~ | ~~0.29~~ | ~~31.1~~ | ~~0.66~~ |
| VS 2125-81 | 64.08 | 15.35 | . | 0.14 | 3.93 | . | 2.87 | 5.23 | . | . | 3.98 | 1.87 | 0.160 | 3.25 | 0.228 | . | 0.517 |
| GBW 07111 | 59.68 | 16.56 | . | 0.15 | 4.72 | . | 3.08 | 2.64 | . | 0.88 | 3.50 | 2.81 | 0.094 | 4.05 | 0.34 | . | 0.77 |

continued analysis listed in mg/kg except % which is mass % and * which is ppb

| Number | Ag | As | Au* | B | Ba% | Be | Bi | Br | C% | Ca% | Cd | Ce | Cl% | Co | Cr | Cs | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-1a | (0.023) | (0.43) | 0.21 | 3.95 | 0.0470 | 3.16 | (0.43) | . | (0.0295) | 1.52 | (0.026) | 45.0 | (0.0065) | 5.90 | 17.6 | 10.6 | 1.67 |
| JG-1 | 0.034 | 0.33 | 0.11 | 6.87 | 0.0466 | 3.15 | 0.50 | (0.068) | (0.0216) | 1.57 | 0.040 | 45.8 | 0.00581 | 4.06 | 53.2 | 10.1 | 2.52 |
| JG-3 | (0.029) | (0.37) | 0.17 | (2.15) | 0.0466 | (1.60) | (0.05) | . | (0.0120) | 2.64 | (0.054) | 40.3 | (0.0156) | 11.7 | 22.4 | 1.78 | 6.81 |
| ~~US GSP-2~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.1340~~ | ~~(1.5)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.50~~ | ~~.~~ | ~~410~~ | ~~.~~ | ~~7.3~~ | ~~20~~ | ~~(1.2)~~ | ~~43~~ |
| VS 2125-81 | . | . | . | 27 | 0.14 | 3.7 | . | . | . | . | . | . | . | 13 | 37 | . | 57 |
| GBW 07111 | 0.066 | 0.4 | . | 3.92 | 0.1900 | 2.11 | 0.05 | (0.34) | (0.057 Org) | . | 0.08 | 112 | 0.023 | 15.6 | 37.6 | 0.97 | 8.8 |

| Number | Dy | Er | Eu | F% | Ga | Gd | Ge | Hf | Hg* | Ho | I* | In | Ir* | K% | La | Li | Lu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-1a | 4.44 | 2.57 | 0.70 | 0.0439 | 16.5 | 4.08 | (1.5) | 3.59 | (4.1) | 0.82 | . | (0.025) | . | 3.29 | 21.3 | 79.5 | 0.44 |
| JG-1 | 4.14 | 2.16 | 0.73 | 0.0498 | 17.8 | 4.28 | 1.44 | 3.56 | 16.5 | 0.81 | (0.012) | (0.044) | . | 3.30 | 22.4 | 86.6 | 0.39 |
| JG-3 | 2.59 | 1.52 | 0.90 | (0.0317) | 17.1 | 2.92 | (1.06) | 4.29 | (2.4) | 0.38 | . | . | (0.0016) | 2.19 | 20.6 | 20.9 | 0.26 |
| ~~US GSP-2~~ | ~~(6.1)~~ | ~~(2.2)~~ | ~~2.3~~ | ~~(0.3000)~~ | ~~22~~ | ~~(12)~~ | ~~.~~ | ~~(14)~~ | ~~.~~ | ~~(1.0)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~4.48~~ | ~~180~~ | ~~(36)~~ | ~~(0.23)~~ |
| VS 2125-81 | . | . | . | . | 22 | . | 1.8 | . | . | . | . | . | . | . | . | 20 | . |
| GBW 07111 | 3.20 | 1.57 | 1.91 | 0.084 | 20.8 | 5.09 | 1.00 | 5.2 | 35 | 0.60 | (78) | 0.08 | . | . | 60.5 | 16.2 | 0.24 |

| Number | Mg% | Mn% | Mo | Na% | Nb | Nd | Ni | P% | Pb% | Pd* | Pr | Rb% | S% | Sb | Sc | Se | Sm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-1a | 0.42 | 0.044 | 0.45 | 2.51 | 11.4 | 20.4 | 6.91 | 0.036 | 0.00264 | (<0.2) | 5.63 | 0.0178 | (0.0011) | (0.048) | 6.21 | . | 4.53 |
| JG-1 | 0.45 | 0.049 | 1.75 | 2.51 | 12.4 | 19.3 | 7.47 | 0.043 | 0.00254 | (<0.2) | 4.83 | 0.0182 | 0.00109 | 0.13 | 6.53 | 0.0030 | 4.62 |
| JG-3 | 1.08 | 0.055 | 0.45 | 2.94 | 5.88 | 17.2 | 14.3 | 0.053 | 0.00117 | (<0.2) | 4.70 | 0.00673 | (0.0055) | (0.08) | 8.76 | . | 3.39 |
| ~~US GSP-2~~ | ~~0.58~~ | ~~0.0320~~ | ~~(2.1)~~ | ~~2.06~~ | ~~27~~ | ~~200~~ | ~~17~~ | ~~0.13~~ | ~~0.0042~~ | ~~.~~ | ~~(51)~~ | ~~0.0245~~ | ~~.~~ | ~~.~~ | ~~6.3~~ | ~~.~~ | ~~27~~ |
| VS 2125-81 | . | . | 3.22 | . | 8.8 | . | 15 | . | 0.016 | . | . | 0.016 | 0.019 | . | 13 | . | . |
| GBW 07111 | . | . | 0.47 | . | 10.6 | 48.1 | 24.4 | . | 0.00198 | . | 13.2 | 0.00701 | 0.011 | 0.06 | 10.3 | 0.03 | 7.74 |

| Number | Sn | Sr% | Ta | Tb | Te | Th | Ti% | Tl | Tm | U | V | W | Y | Yb | Zn% | Zr% | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JG-1a | 4.47 | 0.0187 | 1.90 | 0.81 | . | 12.8 | 0.15 | 0.98 | 0.38 | 4.69 | 22.7 | 12.4 | 32.1 | 2.70 | 0.00365 | 0.0118 | 20 or 100 g |
| JG-1 | 3.60 | 0.0184 | 1.79 | 0.78 | . | 13.2 | 0.16 | 1.03 | 0.41 | 3.47 | 25.2 | (1.58) | 30.6 | 2.47 | 0.00411 | 0.0111 | 20 g |
| JG-3 | 1.40 | 0.0379 | 0.70 | 0.46 | . | 8.28 | 0.29 | (0.40) | 0.24 | 2.21 | 70.1 | (14.1) | 17.3 | 1.77 | 0.00465 | 0.0144 | 100 g |
| ~~US GSP-2~~ | ~~.~~ | ~~0.0240~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~105~~ | ~~0.40~~ | ~~(1.1)~~ | ~~(0.29)~~ | ~~2.40~~ | ~~52~~ | ~~.~~ | ~~28~~ | ~~1.6~~ | ~~0.0120~~ | ~~0.0550~~ | ~~50 g~~ |
| VS 2125-81 | 8.0 | 0.048 | . | . | . | . | . | . | . | . | 90 | . | . | . | 0.012 | 0.021 | 40 g |
| GBW 07111 | 1.44 | 0.1198 | 0.62 | 0.68 | 0.011 | 10.9 | . | 0.39 | 0.26 | 1.40 | 104 | 0.19 | 15.5 | 1.56 | 0.00854 | 0.0224 | 50 g |

## GRAPHITE

analysis listed in mass % Graph = Graphitic, T = Total CDN: RM, all others: CRM CDN: 10 g GGC: 10 g NCS: 50 g USZ: 100 g

| Number | $Al_2O_3$ | **C.Graph** | T.C | $CO_2$ | CaO | $Fe_2O_3$ | $H_2O$+ | $K_2O$ | MgO | MnO | $Na_2O$ | Ni | $P_2O_5$ | Rb | S | $SiO_2$ | $TiO_2$ | Zn | Zr | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC60121 | 5.60 | 76.50 | . | 0.28 | 0.74 | 1.48T | 1.98 | 0.99 | 0.50 | 0.022 | 0.23 | . | 0.16 | . | 0.14 | 10.34 | 0.55 | Volatile:2.72 | Ash:20.78 | |
| GGC-15 | . | 26.66 | 28.19 | . | . | . | . | . | . | . | . | . | . | . | 1.14 | . | . | . | . | . |
| GGC-16 | . | 25.85 | 27.52 | . | . | . | . | . | . | . | . | . | . | . | 1.52 | . | . | . | . | . |
| GGC-17 | . | 23.86 | 24.84 | . | . | . | . | . | . | . | . | . | . | . | 1.01 | . | . | . | . | . |
| GGC-18 | . | 18.22 | 18.96 | . | . | . | . | . | . | . | . | . | . | . | 0.97 | . | . | . | . | . |
| GGC-19 | . | 15.29 | 15.69 | . | . | . | . | . | . | . | . | . | . | . | 0.62 | . | . | . | . | . |
| GGC-20 | . | 12.75 | 13.13 | . | . | . | . | . | . | . | . | . | . | . | 0.44 | . | . | . | . | . |
| USZ 32-2000 | 9.33 | (12.0) | 14.43 | 4.10 | 7.05 | 3.48 | . | 2.54 | 1.94 | 0.03 | 0.47 | 0.007 | . | 0.014 | . | 52.20 | 0.57 | 0.018 | 0.012 | 22.21 |
| USZ 33-2000 | 8.46 | (11.34) | 13.38 | 2.45 | . | 3.61 | . | 2.09 | . | 0.07 | 0.51 | . | . | . | . | 52.84 | 0.49 | . | . | 17.0 |
| NCS DC60120 | 13.03 | 9.91 | . | 0.67 | 5.34 | 6.99T | 2.80 | 2.17 | 5.35 | 0.054 | 1.56 | . | 0.14 | . | 2.59 | 49.34 | 0.64 | . | . | . |
| GGC-21 | . | 9.79 | 10.40 | . | . | . | . | . | . | . | . | . | . | . | 0.50 | . | . | . | . | . |
| GGC-22 | . | 7.10 | 7.48 | . | . | . | . | . | . | . | . | . | . | . | 0.24 | . | . | . | . | . |
| GGC-23 | . | 5.53 | 5.79 | . | . | . | . | . | . | . | . | . | . | . | 0.23 | . | . | . | . | . |
| GGC-24 | . | 3.56 | 3.72 | . | . | . | . | . | . | . | . | . | . | . | 0.17 | . | . | . | . | . |
| GGC-25 | . | 3.94 | 3.12 | . | . | . | . | . | . | . | . | . | . | . | 0.14 | . | . | . | . | . |
| CDN GR-1 | (8.6) | 3.12 | . | . | (6.3) | (4.2) | . | (3.0) | (2.4) | (<0.1) | (0.3) | . | . | . | (1.0) | (65.3) | (0.4) | . | last | (6.8) |
| NCS DC60119 | 12.93 | 2.91 | . | 3.60 | 9.37 | 6.73T | 2.60 | 2.54 | 6.10 | 0.084 | 1.60 | . | 0.13 | . | 1.18 | 49.84 | 0.57 | . | . | . |
| GGC-26 | . | 1.71 | 1.85 | . | . | . | . | . | . | . | . | . | . | . | 0.10 | . | . | . | . | . |
| GGC-27 | . | 1.19 | 1.32 | . | . | . | . | . | . | . | . | . | . | . | 0.09 | . | . | . | . | . |
| GGC-08 | . | 0.39 | 1.03 | . | . | . | . | . | . | . | . | . | . | . | 1.57 | . | . | . | . | . |
| GGC-07 | . | 0.13 | 0.56 | . | . | . | . | . | . | . | . | . | . | . | 0.51 | . | . | . | . | . |

## CRM GRAPHITE ORE

analysis listed in mass % 50 g units

| Number | $Al_2O_3$ | Ash | CaO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | Volatile |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28120 | 10.93 | 95.62 | 11.81 | 5.34 | 2.39 | 8.79 | 0.048 | 1.50 | 0.083 | 1.06 | 52.73 | 0.39 | 2.22 |
| NCS DC28121 | 10.72 | 90.65 | 11.12 | 5.00 | 2.32 | 8.43 | 0.047 | 1.38 | 0.083 | 0.99 | 50.28 | 0.36 | 2.48 |
| NCS DC28119 | 8.13 | 29.00 | 0.23 | 2.09 | 1.33 | 0.55 | 0.032 | 0.28 | 0.087 | 0.02 | 15.66 | 0.44 | 2.88 |
| NCS DC28118 | 1.92 | 11.45 | 0.91 | 1.98 | 0.19 | 1.00 | 0.021 | 0.088 | 0.007 | 0.49 | 5.00 | 0.085 | 1.87 |
| NCS DC28117 | 0.63 | 3.47 | 0.19 | 0.46 | 0.17 | 0.18 | 0.005 | 0.009 | 0.004 | 0.17 | 1.76 | 0.014 | 1.33 |

## CRM GRAPHITE - SYNTHETIC

available as a set or individually analysis listed in mg/kg 50 g units

| Number | Al | As | Ca | Cl | Co | Cr | Cu | Fe | K | Mg | Mn | Mo | $NO_3$ | Na | Ni | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CIBA KD-2~~ | ~~35~~ | ~~(0.05)~~ | ~~98~~ | ~~(4.1)~~ | ~~(0.10)~~ | ~~1.3~~ | ~~1.0~~ | ~~180~~ | ~~(41)~~ | ~~(21)~~ | ~~23~~ | ~~(0.22)~~ | ~~(0.5)~~ | ~~(20)~~ | ~~3.9~~ | ~~(1.6)~~ |
| ~~CIBA LD-4~~ | ~~33~~ | ~~(0.06)~~ | ~~126~~ | ~~(3.3)~~ | ~~(0.11)~~ | ~~3.4~~ | ~~1.3~~ | ~~149~~ | ~~(25)~~ | ~~(7.5)~~ | ~~3.5~~ | ~~(0.62)~~ | ~~(0.5)~~ | ~~(13)~~ | ~~5.5~~ | ~~(1.1)~~ |
| ~~CIBA KD-3~~ | ~~15~~ | ~~(0.04)~~ | ~~62~~ | ~~(4.4)~~ | ~~(0.07)~~ | ~~0.69~~ | ~~0.81~~ | ~~111~~ | ~~(39)~~ | ~~(22)~~ | ~~13~~ | ~~(0.44)~~ | ~~(0.5)~~ | ~~(17)~~ | ~~4.2~~ | ~~(0.90)~~ |
| ~~CIBA KD-6~~ | ~~8.4~~ | ~~(0.04)~~ | ~~79~~ | ~~(3.3)~~ | ~~(0.03)~~ | ~~0.44~~ | ~~0.62~~ | ~~37~~ | ~~(17)~~ | ~~.~~ | ~~4.3~~ | ~~(0.39)~~ | ~~(0.5)~~ | ~~(7)~~ | ~~2.0~~ | ~~(1.2)~~ |
| ~~CIBA PD-7~~ | ~~5.5~~ | ~~(0.03)~~ | ~~22~~ | ~~(6.4)~~ | ~~(0.03)~~ | ~~2.2~~ | ~~0.51~~ | ~~59~~ | ~~(17)~~ | ~~.~~ | ~~1.1~~ | ~~(0.25)~~ | ~~(0.5)~~ | ~~(2)~~ | ~~1.1~~ | ~~(1.0)~~ |

continued

| Number | S | $SO_4$ | Sb | Si | Sn | Sr | Ta | Ti | V | W | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CIBA KD-2~~ | ~~(44)~~ | ~~(88)~~ | ~~(0.05)~~ | ~~(145)~~ | ~~(<0.2)~~ | ~~(2.8)~~ | ~~(0.005)~~ | ~~(46)~~ | ~~(3.6)~~ | ~~(<0.08)~~ | ~~(4.4)~~ | ~~(3.7)~~ |
| ~~CIBA LD-4~~ | ~~(68)~~ | ~~(98)~~ | ~~(0.03)~~ | ~~(404)~~ | ~~.~~ | ~~(2.7)~~ | ~~(0.011)~~ | ~~(49)~~ | ~~(4.3)~~ | ~~(<0.06)~~ | ~~(2.9)~~ | ~~(8.6)~~ |
| ~~CIBA KD-3~~ | ~~(43)~~ | ~~(85)~~ | ~~(0.02)~~ | ~~(147)~~ | ~~.~~ | ~~(1.9)~~ | ~~(0.006)~~ | ~~(38)~~ | ~~(3.8)~~ | ~~(<0.08)~~ | ~~(1.2)~~ | ~~(4.5)~~ |
| ~~CIBA KD-6~~ | ~~(44)~~ | ~~(73)~~ | ~~(0.03)~~ | ~~(66)~~ | ~~.~~ | ~~(1.9)~~ | ~~(0.006)~~ | ~~(51)~~ | ~~(4.9)~~ | ~~(0.03)~~ | ~~(1.7)~~ | ~~(6.0)~~ |
| ~~CIBA PD-7~~ | ~~(23)~~ | ~~(25)~~ | ~~(0.02)~~ | ~~(50)~~ | ~~.~~ | ~~(1.3)~~ | ~~(0.005)~~ | ~~(29)~~ | ~~(2.0)~~ | ~~(0.03)~~ | ~~(0.9)~~ | ~~(4.5)~~ |

## CRM GREISEN

analysis listed in mass% T = Total CGL: **17025**, 100 g units GUW: 50 g units

| Number | $SiO_2$ | $Al_2O_3$ | CaO | F | $Fe_2O_3$ | FeO | $K_2O$ | MgO | MnO | $Na_2O$ | Li | $P_2O_5$ | Rb | Sn | $TiO_2$ | Zn | Zr | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CGL 022** | 80.93 | 10.26 | 0.836 | (1.48) | 3.25T | . | (1.47) | 0.044 | 0.102 | (0.038) | . | 0.018 | (0.0463) | 0.1884 | 0.086 | 0.0273 | 0.0148 | 1.46 |
| GUW GNA | 71.47 | 14.7 | 0.62 | 3.32 | 5.92 | 3.81 | 2.63 | 0.168 | 0.034 | 0.08 | 0.49 | . | 0.202 | 0.19 | 0.022 | 0.0078 | 0.0070 | . |

continued analysis listed in mg/kg

| Number | As | Ba | Bi | Cr | Cs | Cu | Dy | Ga | Mo | Nb | Sr | Ta | Th | U | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CGL 022** | 63.6 | (25.6) | (29.6) | 271 | (29.7) | 563 | (14.1) | 26.1 | . | 28.4 | 16.6 | (4.01) | 32.9 | (6.12) | also 19 more informational elements |
| GUW GNA | 7 | 51 | 220 | . | 45 | . | 3 | . | 100 | . | . | 29 | . | 22 | |

## CRM GYPSUM ROCK

analysis listed in mass % 100 g units

| Number | $SO_3$ | CaO | $Al_2O_3$ | $CO_2$ | $Fe_2O_3$* | $H_2O$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | SrO | L.O.I.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOMTAR GYP A | 46.2 | 32.9 | 0.10 | 0.47 | 0.05 | 19.4 | 0.021 | 0.18 | 0.009 | 0.011 | 0.45 | 0.11 | 20.06 |

* Total iron calculated as Fe2O3 ** Loss on ignition at 1000'C

continued analysis listed in mg/kg

| Number | As | Ba | Br | Cd | Ce | Cl | Co | Cr | Cs | Eu | Hf | La |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOMTAR GYP A | 0.19 | (28) | (0.5) | 0.51 | (0.7) | 12 | (0.2) | (2) | (0.15) | 0.06 | 0.26 | 0.24 |

continued

| Number | Lu | Mn | Rb | Sb | Sc | Sm | Th | Ti | U | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOMTAR GYP A | (0.006) | 19 | (0.8) | 0.04 | 0.09 | 0.041 | (0.1) | (78) | 0.1 | 0.02 | 7 | (9) |

## CRM GYPSUM ROCK

analysis listed in mass %

| Number | $SO_3$ | CaO | $Al_2O_3$ | $CO_2$ | Cl- | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | $Na_2O$ | $SiO_2$ | SrO | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03109a | 51.91 | 39.24 | 0.34 | (4.02) | 0.033 | 0.16 | 0.39 | 0.094 | 1.74 | 0.065 | 1.68 | (0.27) | 0.016 | 4.55 | 50 g |
| GBW 03111a | 40.72 | 32.30 | 0.14 | (5.44) | 0.0032 | 0.11 | 17.95 | 0.026 | 2.47 | 0.014 | 0.63 | (0.096) | 0.010 | 23.60 | 50 g |
| NCS DC62106d * | 43.91 | 32.21 | 0.25 | . | . | 0.20 | . | 0.08 | 0.72 | 0.11 | 0.99 | . | 0.01 | 21.52 | 20 g |
| GBW 03111 | 37.64 | 30.28 | 1.14 | (5.80) | 0.013 | 0.38 | 16.62 | 0.23 | 3.19 | 0.014 | 4.16 | (0.077) | 0.058 | (22.88) | 50 g |

* NCS DC62106d also contains 0.17% adhered water and 19.78% crystallized water.

## RM GYPSUM BYPRODUCT

analysis listed in mass % based on a dry (40'C) sample — 100 g units

| Number | $SO_3$ | CaO | $Al_2O_3$ | $CO_2$ | $Cr_2O_3$ | $T.Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | SrO | $TiO_2$ | $V_2O_5$ | %Total | LOI* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOMTAR FGD-1 | 46.4 | 32.7 | 0.023 | 0.02 | 0.0002 | 0.014 | 20.70 | 0.007 | 0.007 | 0.005 | 0.03 | 0.13 | 0.012 | . | 0.0003 | 100.05 | 21.04 |
| DOMTAR FGD-2 | 45.6 | 32.8 | 0.033 | 0.62 | 0.0015 | 0.043 | 20.38 | 0.01 | 0.019 | 0.02 | 0.05 | 0.21 | 0.024 | . | 0.0009 | 98.81 | 21.33 |
| DOMTAR TIG-1 | 43.4 | 32.3 | 0.57 | 1.41 | 0.036 | 0.26 | 20.3 | 0.008 | 0.12 | 0.036 | 0.04 | 0.11 | 0.42 | 0.82 | 0.10 | 99.93 | 22.03 |

$H_2O+$ combined water at 250'C * Loss on ignition at 1000'C (1 hr)

continued analysis listed in mg/kg

| Number | As | Ce | Cl | Co | Cr | Dy | Eu | F | Hf | La | Mn | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOMTAR FGD-1 | 0.10 | 0.5 | (100) | 0.02 | 1.2 | . | 0.02 | 95 | . | 0.35 | 2.0 | 0.03 |
| DOMTAR FGD-2 | 0.48 | 1.7 | (115) | 0.07 | 10.2 | 0.48 | 0.09 | 320 | 0.06 | 2.18 | 2.5 | 0.024 |
| DOMTAR TIG-1 | 0.22 | 6 | 400 | 0.26 | 246 | 0.42 | 0.08 | 230 | 3.0 | 2.7 | 36 | 0.05 |

| Number | Sc | Se | Sm | Ta | Tb | Th | Ti | U | V | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DOMTAR FGD-1 | 0.023 | 0.8 | 0.07 | . | . | 0.03 | 75 | . | 1.5 | . | 1.7 | . |
| DOMTAR FGD-2 | 0.166 | 3.0 | 0.52 | . | 0.07 | 0.38 | 75 | 1.10 | 5.1 | 0.27 | 2.3 | (10) |
| DOMTAR TIG-1 | 17.1 | . | 0.65 | 3.1 | (2) | 2.14 | 6154 | 2.5 | 560 | 0.31 | (32) | (80) |

## CRM HORNBLENDITE WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | $Al_2O_3$ | $CO_2$ | CaO | FeO | $T.Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | Mn | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | Ti | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2113-81 | 14.24 | . | 11.04 | 9.72 | 18.26 | . | 0.382 | 12.70 | . | 0.144 | 2.14 | . | . | 37.95 | . | 1.91 | . |
| NCS DC73377 | 13.76 | (0.16) | 9.6 | 10.8 | 14.8 | (1.7) | 0.48 | 7.2 | 0.1600 | . | 2.07 | . | (0.0060) | 49.62 | 0.5510 | . | 1.06 |
| JH-1 | 5.66 | . | 15.02 | (8.09) | 10.27 | . | 0.53 | 16.73 | . | 0.19 | 0.71 | 0.099 | . | 48.18 | . | 0.67 | . |

continued analysis listed in mg/kg except * which is ng/g

| Number | Ag | As | B | Ba | Be | Bi | Cd | Ce | Cl | Co | Cr | Cs | Cu% | Dy | Er | Eu | F | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2113-81 | . | . | . | 99 | . | . | . | . | . | 74 | 15 | . | 0.074 | . | . | . | . | 25 | . |
| NCS DC73377 | (0.05) | 26 | 12 | 62 | 0.34 | (0.06) | (0.14) | 7.7 | (116) | 52 | 137 | 1.8 | 0.0084 | 3.5 | 2.3 | 0.91 | 200 | 17.2 | 2.8 |
| JH-1 | . | . | . | 106 | . | . | . | 17.6 | . | 51.5 | 616 | 0.87 | 0.00086 | 2.5 | 1.2 | 0.86 | . | 7.9 | . |

| Number | Ge | Hf | Hg* | Ho | In | La | Li | Lu | Mo | Nb | Nd | Ni | P | Pb | Pr | Rb | Sb | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2113-81 | . | . | . | . | . | . | . | . | 1.3 | . | . | 57 | . | 4.9 | . | . | . | 58 |
| NCS DC73377 | 1.46 | 1.5 | 3.3 | 0.85 | (0.06) | 2.9 | 11.2 | 0.39 | 0.15 | 2.7 | 6.5 | 117 | 360 | (8) | 1.25 | 29 | 0.63 | 43 |
| JH-1 | . | 1.4 | . | 0.53 | . | 7.9 | . | 0.17 | 0.77 | 4.2 | 11.6 | 58.2 | . | 2.6 | . | 14.4 | . | 77.6 |

| Number | Se | Sm | Sn | Sr | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2113-81 | . | . | 2.9 | . | . | . | . | . | . | . | 39 | . | . | 1.5 | 1370 | 21 | 40 g |
| NCS DC73377 | 0.083 | 2.1 | (0.8) | 142 | (0.18) | 0.57 | (0.4) | (0.11) | 0.37 | (0.14) | 296 | 0.34 | 20 | 2.4 | 100 | (57) | 70 g |
| JH-1 | . | 3.1 | . | 153 | 0.23 | 0.52 | 1.4 | . | . | 0.58 | 228 | . | 13.7 | 1.2 | 61.8 | 48.3 | 100 g |

**AMPHIBOLITE**

## IRON PELLETS (supplied in homogeneous powder form)

# = class, where 1 = CRM and 2 = RM  analysis listed in mass % except * which is mg/kg

| # | Number | Fe | Fe(met) | FeO | Al | $Al_2O_3$ | Ca | CaO | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | VS R10/4 | 90.9 | 87.3 | . | . | 0.29 | . | 1.65 | . | 0.30 | . | . | . | 0.094 | 0.0104 | 0.0062 | . | 4.11 | . | . |
| 1 | SRM 691 | 90.5 | . | . | . | 1.21 | | 0.64 | . | 0.51 | . | 0.042 | . | 0.177 | 0.005 | (0.009) | . | 3.6 | . | 0.27 |
| 1 | NCS DC28240a | 66.18 | . | 0.78 | . | 0.43 | . | 0.51 | . | 0.79 | . | 0.040 | . | . | 0.010 | 0.0066 | . | 3.81 | . | 0.048 |
| 1 | VS R29 | 64.95 | . | 0.48 | . | 0.38 | . | 0.45 | . | 0.149 | . | . | . | . | 0.0123 | 0.0118 | . | 6.13 | . | . |
| 1 | NCS DC28239b | 63.78 | . | 0.77 | . | 0.98 | . | 0.85 | . | 1.59 | . | 0.065 | . | . | 0.016 | 0.0086 | . | 5.29 | . | 0.18 |
| 1 | NCS DC28020a | 63.07 | . | (0.04) | . | 1.47 | . | 1.34 | . | 0.96 | . | 0.303 | . | 0.103 | 0.028 | 0.0084 | . | 5.22 | . | 0.258 |
| 1 | VS R28 | 63.01 | . | 1.16 | . | 0.37 | . | 4.09 | . | 0.194 | . | . | . | . | 0.0121 | 0.087 | . | 5.11 | . | . |
| 1 | NCS DC28020b | 61.81 | . | (0.18) | . | 1.48 | . | 1.30 | . | 1.00 | . | 0.310 | . | 0.099 | 0.032 | 0.0055 | . | 6.88 | . | 0.251 |
| 1 | NCS DC11025 | 61.37 | . | (1.92) | . | 1.35 | . | 1.04 | . | 0.80 | . | 0.120 | . | 0.105 | 0.093 | 0.021 | . | 6.59 | . | 1.61 |
| 1 | NCS DC28020c | 60.46 | . | 0.33 | . | 0.76 | . | 0.75 | . | 5.15 | . | 0.130 | . | 0.036 | 0.013 | 0.029 | . | 6.12 | . | 0.154 |
| 1 | VS R3/2 | 58.72 | . | 2.53 | . | 2.50 | . | 4.47 | . | 2.48 | . | 0.232 | . | . | 0.0027 | 0.005 | . | 3.74 | . | 2.49 |
| 1 | VS R23/1 | 58.7 | . | . | . | . | . | 4.45 | . | . | . | . | . | . | . | . | . | 3.75 | . | . |
| ~~1~~ | ~~NCS DC28021a~~ | ~~57.88~~ | ~~.~~ | ~~6.53~~ | ~~.~~ | ~~2.54~~ | ~~.~~ | ~~3.15~~ | ~~.~~ | ~~3.11~~ | ~~.~~ | ~~0.126~~ | ~~.~~ | ~~0.105~~ | ~~0.016~~ | ~~0.115~~ | ~~.~~ | ~~7.92~~ | ~~.~~ | ~~0.207~~ |

| Number | As* | C | Cd* | Co | Cr | Cu | K | $K_2O$ | Mo* | N* | Ni | Pb* | Sn | V | $V_2O_5$ | Zn | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS R10/4 | . | 1.72 | . | . | . | 0.0019 | . | 0.055 | . | . | . | 1.8 | . | . | . | 0.0018 | 100 g |
| SRM 691 | (14) | (0.12T) | (<5) | 0.031 | 0.025 | 0.030 | 0.065 | . | (<20) | (50) | (0.269) | (<20) | (<0.001) | 0.015 | . | (0.004) | 100 g |
| NCS DC28240a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g |
| VS R29 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g |
| NCS DC28239b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g |
| NCS DC28020a | . | . | . | . | . | 0.0089 | . | 0.078 | . | . | . | . | . | . | . | 0.012 | 50 g |
| VS R28 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g |
| NCS DC28020b | . | . | . | . | . | 0.0089 | . | 0.066 | . | . | . | . | . | 0.155 | . | 0.012 | 50 g |
| NCS DC11025 | . | . | . | . | . | . | . | 0.111 | . | . | . | . | . | . | . | 0.012 | 70 g |
| NCS DC28020c | . | . | . | . | . | 0.010 | . | 0.081 | . | . | . | . | . | . | . | 0.012 | 50 g |
| VS R3/2 | . | . | . | 0.020 | . | . | . | . | . | . | . | . | . | . | 0.56 | . | 100 g |
| VS R23/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 150 g |
| ~~NCS DC28021a~~ | ~~12~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.018~~ | ~~.~~ | ~~0.265~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~47~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.039~~ | ~~50 g~~ |

## CRM IRON SULPHIDE CONCENTRATE

analysis listed in mass %  25 g units

| Number | Al | Ca | Co | Cr | Cu | Fe | K | Mg | Mn | Na | Ni | P | Pb | S | $SiO_2$ | Ti | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN TPO-1 | (3.51) | (2.17) | 0.021 | (0.03) | 0.118 | 34.85 | (0.56) | (1.66) | (0.08) | (0.85) | 0.617 | (0.03) | (0.02) | 18.03 | 25.52 | (0.35) | (0.02 |

**CRM** **IRON ORE, chart 1 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | VS R21/2 | 99.0 | . | . | . | . | . | . | . | . | . | 0.3 | . | . | . | 0.01 | . | 0.02 | 0.06 | . | . | . |
| 1 | VS R16/3 | 98.2 | . | . | . | . | . | . | . | . | . | 0.380 | . | . | . | 0.0110 | . | 0.0198 | 0.073 | . | . | . |
| 1 | FLX 2001 | Fe2O3:96.47 | . | . | 1.40 | . | 0.026 | . | . | . | . | .Mn2O3:0.134 | . | . | . | . | 0.202 | . | . | 1.67 | . | 0.134 |
| 1 | JK 55 | 92.47 | . | . | (0.21) | . | (1.2) | . | (0.032) | . | (0.86) | . | (0.084) | . | . | (0.036) | . | . | . | (1.0) | . | (0.17) |
| ~~1~~ | ~~ECRM 685-1~~ | ~~91.103~~ | ~~.~~ | ~~0.3197~~ | ~~.~~ | ~~0.1395~~ | ~~.~~ | ~~0.0418~~ | ~~.~~ | ~~0.2394~~ | ~~.~~ | ~~0.0415~~ | ~~.~~ | ~~0.0773~~ | ~~.~~ | ~~0.0170~~ | ~~.~~ | ~~0.0031~~ | ~~0.7950~~ | ~~.~~ | ~~0.2199~~ | ~~.~~ |
| 2 | VS R40 | 90.95 | . | . | 0.82 | 0.90 | . | . | 0.05129 | . | 0.299 | . | . | . | 0.084 | 0.0094 | . | 0.0057 | . | 4.13 | . | . |
| 1 | NCS DC28039 | 72.02 | 28.78 | . | 0.095 | . | 0.026 | . | 0.0064 | . | 0.043 | 0.043 | . | . | 0.0008 | 0.0016 | . | 0.0030 | . | 0.14 | 0.029 | . |
| 1 | NCS DC28029 | 72.01 | 28.63 | . | 0.095 | . | 0.025 | . | 0.0068 | . | 0.042 | 0.043 | . | . | 0.0008 | 0.0013 | . | 0.0028 | . | 0.158 | 0.028 | . |
| ~~1~~ | ~~NCS DC16002~~ | ~~71.79~~ | ~~28.69~~ | ~~.~~ | ~~0.069~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.038~~ | ~~0.053~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0022~~ | ~~.~~ | ~~0.055~~ | ~~.~~ | ~~0.36~~ | ~~.~~ | ~~.~~ |
| ~~1~~ | ~~GIOP-118~~ | ~~71.51~~ | ~~34.86~~ | ~~.~~ | ~~(<0.01)~~ | ~~.~~ | ~~0.0493~~ | ~~.~~ | ~~(<0.01)~~ | ~~.~~ | ~~0.0576~~ | ~~0.0491~~ | ~~.~~ | ~~(0.019)~~ | ~~.~~ | ~~0.0058~~ | ~~.~~ | ~~0.0026~~ | ~~.~~ | ~~0.763~~ | ~~.~~ | ~~(<0.01)~~ |
| 1 | JK 29A | 71.36 | . | . | 0.232 | . | 0.082 | . | 0.0087 | . | 0.223 | . | 0.0632 | . | 0.015 | 0.0059 | . | 0.0059 | . | 0.33 | . | 0.292 |
| 1 | NCS DC11032 | 70.69 | 27.98 | . | 0.32 | . | 0.066 | . | 0.012 | . | 0.045 | . | 0.28 | . | 0.010 | 0.012 | . | 0.0032 | . | 0.293 | . | 0.535 |
| 1 | JK 42A | 70.66 | . | . | 0.278 | . | 0.199 | . | 0.0157 | . | 0.382 | . | 0.0506 | . | 0.043 | 0.0247 | . | 0.0082 | . | 0.800 | . | 0.385 |
| 1 | IMZ 350 | 70.20 | 30.06 | . | 0.077 | . | 0.084 | . | 0.015 | . | 0.19 | 0.030 | . | . | 0.033 | 0.007 | . | 0.097 | . | 2.51 | . | 0.021 |
| 1 | ECRM 687-1 | 69.66 | . | 0.0356 | . | 0.0113 | . | 0.0011 | . | 0.0018 | . | 0.1658 | . | 0.0030 | . | 0.0120 | . | . | 0.0157 | . | 0.0303 | . |
| 1 | GIOP-117 | 69.631 | . | . | 0.06 | . | (0.01) | . | (0.0026) | . | (0.013) | 0.008 | . | 0.011 | . | 0.00325 | . | 0.0026 | . | 0.203 | . | 0.0902 |
| 1 | NCS DC28220 | 69.05 | 23.8 | . | 0.50 | . | 0.20 | . | . | . | 0.17 | . | 0.079 | . | . | 0.010 | . | 0.011 | . | 2.45 | . | 0.313 |
| 1 | NCS DC13019c | 68.96 | 28.98 | . | 0.174 | . | 0.196 | . | 0.0068 | . | 0.268 | . | 0.049 | . | 0.0060 | 0.010 | . | 0.0277 | . | 3.98 | . | 0.0174 |
| 2 | IMZ 324 | 68.93 | 28.27 | . | 0.11 | . | 0.107 | . | 0.026 | . | 0.24 | 0.026 | . | . | (0.04) | 0.014 | . | 0.044 | . | 3.96 | . | 0.028 |
| 1 | NCS DC28219 | 68.55 | 23.0 | . | 0.54 | . | 0.21 | . | . | . | 0.20 | . | 0.052 | . | . | 0.0054 | . | 0.027 | . | 3.21 | . | 0.116 |
| 1 | VS R38 | 68.55 | . | . | 0.212 | . | 0.118 | . | 0.087 | . | 0.131 | . | 0.035 | . | 0.036 | 0.0122 | . | 0.334 | . | 4.56 | . | 0.022 |
| 1 | NCS DC28005c | 68.38 | 28.80 | . | 0.58 | . | 0.78 | . | 0.050 | . | 1.15 | . | 0.086 | . | 0.026 | 0.0035 | . | 0.034 | . | 2.25 | . | 0.057 |
| 2 | IMZ 323 | 68.35 | 27.65 | . | 0.23 | . | 0.109 | . | 0.027 | . | 0.28 | 0.043 | . | . | 0.035 | 0.018 | . | 0.052 | . | 4.31 | . | 0.017 |
| 1 | NCS DC28115 | 68.29 | 28.25 | . | 0.43 | . | 0.70 | . | 0.060 | . | 1.25 | 0.061 | . | . | 0.021 | 0.0047 | . | 0.041 | . | 2.08 | 0.034 | 0.057 |
| 1 | NCS DC28032 | 68.29 | 0.24 | . | 0.74 | . | 0.074 | . | 0.0063 | . | 0.025 | 0.096 | . | . | 0.015 | 0.028 | . | 0.0028 | . | 0.85 | 0.050 | . |
| 1 | NCS DC93024 | 68.02 | 30.50 | . | 0.34 | . | 0.35 | . | 0.018 | . | 0.19 | 0.017 | . | . | 0.012 | 0.017 | . | 0.301 | . | 4.58 | . | 0.056 |
| 1 | IMZ 352 | 67.84 | 29.09 | . | 0.206 | . | 0.295 | . | 0.020 | . | 0.55 | 0.032 | . | . | 0.030 | 0.018 | . | 0.061 | . | 4.56 | . | 0.015 |
| 1 | NCS DC28005b | 67.84 | 29.72 | . | 0.45 | . | 0.155 | . | 0.055 | . | 0.202 | . | 0.030 | . | 0.018 | 0.0025 | . | 0.106 | . | 5.32 | . | 0.097 |
| 1 | NCS DC28221 | 67.84 | 28.8 | . | 0.60 | . | 0.63 | . | . | . | 1.40 | . | 0.070 | . | . | 0.0046 | . | 0.041 | . | 2.34 | . | 0.061 |
| 2 | IMZ 320 | 67.76 | 27.37 | . | 0.12 | . | 0.13 | . | 0.049 | . | 0.30 | 0.029 | . | . | 0.037 | 0.022 | . | 0.012 | . | 5.30 | . | 0.016 |
| 2 | IMZ 325 | 67.73 | 28.03 | . | 0.20 | . | 0.17 | . | 0.027 | . | 0.27 | 0.031 | . | . | (0.03) | 0.016 | . | 0.077 | . | 5.01 | . | 0.018 |
| 1 | IMZ 351 | 67.55 | 28.52 | . | 0.132 | . | 0.095 | . | 0.019 | . | 0.25 | 0.0121 | . | . | 0.037 | 0.008 | . | 0.023 | . | 5.71 | . | 0.010 |
| 2 | IMZ 261/1 | 67.54 | . | . | 0.59 | . | 0.30 | . | . | . | 1.37 | . | 0.16 | . | . | (0.019) | . | 0.080 | . | 3.16 | . | . |
| 1 | VS R25/1 | 67.3 | . | . | . | . | 0.14 | . | . | . | 0.25 | . | . | . | . | . | . | . | . | 3.37 | . | . |
| 1 | VS R22/2 | 67.0 | . | . | 0.3 | . | 0.1 | . | . | . | 0.2 | . | . | . | . | 0.008 | . | . | . | 3.3 | . | . |
| 1 | NCS DC73009 | 66.87 | 23.14 | . | 0.99 | . | 0.14 | . | 0.030 | . | 0.22 | 0.071 | . | . | 0.012 | (0.011) | . | 0.0055 | . | 5.05 | 0.059 | . |
| 1 | SRM 690 | 66.8 | . | . | 0.17 | . | 0.20 | . | 0.0030 | . | 0.177 | . | 0.230 | . | 0.0027 | 0.009 | . | (0.004) | . | 3.70 | . | 0.021 |
| 1 | OREAS 40 | 66.72 | 1.76 | . | 0.130 | . | 0.015 | . | 0.018 | . | 0.017 | . | 0.020 | . | . | 0.004 | . | 0.008 | . | 4.64 | . | 0.050 |
| 1 | ECRM 690-1 | 66.70 | . | 0.198 | . | 0.269 | . | 0.0158 | . | 0.815 | . | 0.0337 | . | 0.0312 | . | 0.0085 | . | . | 0.881 | . | 0.229 | . |
| 1 | NCS DC28222 | 66.64 | 27.9 | . | 0.76 | . | 0.86 | . | . | . | 1.62 | . | 0.091 | . | . | 0.0051 | . | 0.096 | . | 2.96 | . | 0.070 |
| 1 | NCS DC14028c | 66.56 | 26.01 | . | 0.28 | . | 0.11 | . | 0.009 | . | 0.11 | 0.135 | . | . | (0.006) | 0.015 | . | 0.0045 | . | 6.09 | 0.283 | . |
| 1 | NCS DC14208 | 66.56 | 26.01 | . | 0.28 | . | 0.11 | . | 0.009 | . | 0.11 | 0.135 | . | . | (0.006) | 0.015 | . | 0.0045 | . | 6.09 | 0.283 | . |
| 1 | NCS DC28037 | 66.54 | 0.21 | . | 1.43 | . | 0.031 | . | 0.012 | . | 0.054 | 0.482 | . | . | 0.015 | 0.034 | . | 0.0071 | . | 0.962 | 0.051 | . |
| 1 | NCS DC28109 | 66.52 | 27.91 | . | 0.62 | . | 1.10 | . | 0.091 | . | 1.96 | 0.070 | . | . | 0.032 | 0.0062 | . | 0.064 | . | 3.26 | 0.037 | 0.061 |
| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |

| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS R21/2 | . | . | 0.02 | . | . | . | . | . | . | . | . | . | . | . | 100 g | O: 0.3 |
| VS R16/3 | . | . | 0.108 | . | Insoluble Residue: 0.155 | | | . | . | . | . | . | . | . | 100 g | O: 1.15 |
| FLX 2001 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 35 g | |
| JK 55 | . | . | . | . | Metallic Iron: 84.15% | | | . | . | . | . | (0.27) | . | . | 100 g | |
| ~~ECRM 685-1~~ | ~~.~~ | ~~.~~ | ~~1.407~~ | ~~.~~ | ~~0.0133~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0175~~ | ~~.~~ | ~~0.1436~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| VS R40 | . | . | 1.393 | . | Metallic Iron: 85.7% | | | . | . | . | . | . | . | . | 100 g | |
| NCS DC28039 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| NCS DC28029 | 0.00012 | . | . | . | 0.0008 | 0.0062 | . | 0.0007 | 0.0022 | 0.0002 | . | . | 0.0026 | . | 50 g | |
| ~~NCS DC16002~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| ~~GIOP-118~~ | ~~(0.011)~~ | ~~(0.0055)~~ | ~~.~~ | ~~(0.0071)~~ | ~~(0.0026)~~ | ~~0.2681~~ | ~~.~~ | ~~0.0071~~ | ~~0.1539~~ | ~~(0.0078)~~ | ~~(0.0021)~~ | ~~.~~ | ~~(0.0034)~~ | ~~-3.857~~ | ~~10 g~~ | |
| JK 29A | . | . | . | . | 0.0106 | 0.0057 | . | 0.0007 | 0.0167 | . | . | 0.266 | 0.0016 | . | 100 g | |
| NCS DC11032 | . | . | . | . | . | . | . | . | . | . | . | 0.258 | 0.030 | . | 70 g | |
| JK 42A | . | . | . | . | 0.0105 | 0.0010 | . | 0.0007 | 0.0129 | . | . | 0.251 | 0.0015 | . | 100 g | |
| IMZ 350 | . | (0.0019) | 0.024 | . | (0.0024) | 0.0031 | . | (0.0006) | . | . | 0.0020 | . | (0.0017) | . | 100 g | |
| ECRM 687-1 | . | . | Mo: 0.0020 | 0.0173 | . | 0.0227 | . | 0.0030 | 0.0122 | . | . | Sn: 0.0006 | 0.0051 | . | 100 g | |
| GIOP-117 | (0.0038) | (0.0038) | . | 0.012 | (0.001) | (0.0031) | . | (0.0037) | (0.0026) | (0.0048) | (0.0013) | . | (0.0014) | 0.085 | 10 g | |
| NCS DC28220 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC13019c | . | . | . | . | . | . | . | . | . | 0.0052 | . | . | 0.0030 | . | 50 g | |
| IMZ 324 | . | 0.0024 | 0.052 | . | 0.003 | 0.0025 | . | 0.0014 | 0.0013 | 0.0002 | . | . | (0.003) | 2.91 | 100 g | |
| NCS DC28219 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| VS R38 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | $Fe_2O_3$: 30.6 |
| NCS DC28005c | . | . | . | . | . | . | . | 0.0037 | . | . | . | . | 0.0055 | . | 50 g | |
| IMZ 323 | . | 0.0020 | 0.027 | . | 0.0026 | 0.0020 | . | 0.0007 | 0.0002 | 0.0015 | (0.002) | . | 0.0021 | 2.49 | 100 g | |
| NCS DC28115 | . | . | . | . | . | . | . | 0.0065 | . | . | . | . | 0.0037 | . | 70 g | |
| NCS DC28032 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| NCS DC93024 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| IMZ 352 | . | (0.0019) | 0.124 | 0.013 | . | 0.0011 | . | (0.0005) | . | (0.0012) | 0.0009 | . | (0.0013) | . | 100 g | |
| NCS DC28005b | . | . | . | . | . | 0.0075 | . | . | . | . | . | . | 0.0020 | . | 50 g | |
| NCS DC28221 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| IMZ 320 | 0.0015 | 0.0019 | 0.033 | . | (0.003) | 0.003 | . | 0.0015 | 0.0013) | 0.0015 | 0.0015 | . | 0.002 | 2.87 | 100 g | |
| IMZ 325 | . | 0.0021 | 0.094 | . | 0.002 | 0.0023 | . | 0.0010 | . | 0.0017 | 0.0018 | . | (0.003) | 2.53 | 100 g | |
| IMZ 351 | (0.0009) | (0.0019) | 0.103 | 0.043 | (0.0027) | 0.0014 | . | 0.0012 | . | (0.0009) | 0.0009 | . | (0.0016) | . | 100 g | |
| IMZ 261/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| VS R25/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 150 g | |
| VS R22/2 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 150 g | |
| NCS DC73009 | . | . | . | . | . | . | . | (0.0015) | . | . | . | . | . | . | 50 g | |
| SRM 690 | . | . | . | . | . | (0.003) | . | . | . | . | (0.0045) | . | . | . | 100 g | FeII: 0.83 |
| OREAS 40 | . | . | . | . | . | . | . | . | . | . | 0.0013 | . | . | -0.248 | 10 g | $Fe_2O_3$:[64.96] last |
| ECRM 690-1 | . | . | . | . | 0.0089 | 0.0113 | . | 0.0006 | 0.0200 | . | 0.1417 | . | . | . | 100 g | |
| NCS DC28222 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC14028c | . | . | . | . | . | . | . | 0.0010 | . | . | . | . | . | . | 50 g | |
| NCS DC14208 | . | . | . | . | . | . | . | 0.0010 | . | . | . | . | . | . | 50 g | |
| NCS DC28037 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| NCS DC28109 | . | . | . | . | . | . | . | 0.010 | . | . | . | . | 0.0052 | . | 70 g | |
| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | LOI | Units | Other |

**CRM** **IRON ORE, chart 2 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NCS DC28028 | 66.47 | 0.58 | . | 1.36 | . | 0.028 | . | 0.014 | . | 0.091 | 0.137 | . | . | 0.005 | 0.055 | . | 0.0066 | . | 1.79 | 0.046 | . |
| 1 | IMZ 353 | 66.42 | 1.41 | . | 0.40 | . | 0.098 | . | 0.011 | . | 0.054 | 0.051 | . | . | 0.012 | 0.018 | . | 0.0049 | . | 4.07 | . | 0.28 |
| 1 | SARM 145 | 66.42 | . | . | 0.58 | . | 0.15 | . | 0.09 | . | 0.02 | . | 0.02 | . | 0.02 | . | 0.12 | (0.014) | . | 3.56 | . | 0.03 |
| 1 | NCS DC28027 | 66.34 | 0.07 | . | 1.42 | . | 0.02 | . | 0.013 | . | 0.063 | 0.48 | . | . | 0.0055 | 0.034 | . | 0.0071 | . | 1.02 | 0.057 | . |
| 1 | NCS DC28223 | 66.31 | 24.4 | . | 1.04 | . | 0.64 | . | . | . | 0.26 | . | 0.085 | . | . | 0.039 | . | 0.011 | . | 4.17 | . | 0.709 |
| 1 | BCS 517 | 66.30 | . | 0.508 | . | 0.033 | . | 0.0105 | . | 0.0311 | . | 0.679 | . | 0.0097 | . | 0.0408 | . | 0.0090 | 0.519 | . | 0.0332 | . |
| 1 | JSS 805-2 | 66.22 | . | 0.565 | . | 0.0071 | . | 0.012 | . | 0.0221 | . | 0.596 | . | 0.0026 | . | 0.047 | . | 0.0077 | 0.552 | . | 0.0409 | . |
| 1 | GIOP-116 | 66.214 | . | . | 0.909 | . | 0.0898 | . | 0.0088 | . | 0.0559 | 0.04 | . | 0.035 | . | 0.01331 | . | 0.00428 | . | 3.577 | . | 0.1249 |
| 1 | NCS DC28005a | 66.18 | 27.01 | . | 0.54 | . | 0.74 | . | 0.054 | . | 2.64 | . | 0.103 | . | 0.031 | 0.0067 | . | 0.059 | . | 2.90 | . | 0.077 |
| 1 | NCS DC28033 | 66.17 | 26.04 | . | 0.260 | . | 0.21 | . | 0.014 | . | 0.18 | 0.043 | . | . | 0.0015 | 0.012 | . | 0.044 | . | 7.21 | 0.024 | . |
| 2 | DH 1137 | 66.15 | 0.32 | . | 0.442 | . | 1.930 | . | 0.011 | . | 0.164 | 0.038 | . | . | 0.020 | . | 0.113 | 0.003 | . | 2.365 | . | 0.032 |
| 1 | ECRM 682-2 | 66.12 | . | 0.325 | . | . | . | . | . | 0.0133 | . | 0.0311 | . | . | . | 0.0529 | . | 0.0140 | 0.833 | . | 0.0441 | . |
| 1 | IMZ 358 | 66.08 | 0.84 | . | 0.214 | . | 2.61 | . | 0.029 | . | 0.23 | 0.027 | . | . | 0.032 | 0.0066 | . | 0.0103 | . | 2.60 | . | 0.022 |
| 1 | VS R1/4 | 66.0 | 26.1 | . | 0.28 | . | 0.17 | . | . | . | 0.38 | . | . | . | . | 0.0157 | . | 0.029 | . | 7.38 | . | . |
| 1 | NCS DC28214 | 65.97 | 27.0 | . | 0.70 | . | 0.43 | . | . | . | 0.45 | . | 0.094 | . | . | 0.013 | . | 0.291 | . | 5.02 | . | 0.541 |
| 2 | BS 105 | 65.9 | . | 0.098 | . | 0.50 | . | 0.013 | . | 0.188 | . | 0.087 | . | 0.016 | . | 0.0077 | . | (0.002) | 2.17 | . | 0.0074 | . |
| 1 | JK 28 | 65.86 | 2.4 | 0.35 | . | 0.21 | . | 0.99 | . | 0.18 | . | 0.045 | . | 0.078 | . | 0.045 | . | 0.004 | 1.96 | . | 0.11 | . |
| 1 | IMZ 362 | 65.81 | 0.4 | . | 0.123 | . | 1.69 | . | 0.118 | . | 0.18 | 0.0087 | . | . | 0.058 | 0.0091 | . | 0.0021 | . | 3.79 | . | 0.008 |
| 1 | VS R37 | 65.81 | . | . | 0.264 | . | 0.050 | . | . | . | 0.029 | . | 0.015 | . | . | 0.0110 | . | 1.29 | . | 3.06 | . | 0.013 |
| 1 | **IMS PBS-204** | 65.75 | . | . | 0.98 | . | (0.010) | . | 0.003 | . | 0.040 | 0.019 | . | . | 0.010 | 0.124 | . | 0.014 | . | 1.14 | . | 0.060 |
| 2 | DH 1136 | 65.74 | . | . | 0.345 | . | 0.370 | . | 0.033 | . | 0.083 | 1.21 | . | . | 0.025 | . | 0.017 | 0.002 | . | 3.35 | . | 0.023 |
| 1 | NCS DC28114 | 65.71 | 27.14 | . | 0.83 | . | 0.72 | . | 0.048 | . | 3.33 | 0.127 | . | . | 0.015 | 0.013 | . | 0.158 | . | 2.07 | 0.418 | 0.697 |
| 1 | ECRM 604-1 | 65.69 | . | 0.93 | . | 0.107 | . | . | . | 0.049 | . | 0.092 | . | . | . | 0.053 | . | 0.015 | 1.27 | . | 0.060 | . |
| 1 | JSS 850-4 | 65.67 | (0.30) | . | 0.40 | . | 0.41 | . | 0.075 | . | 0.79 | 0.019 | . | . | 0.129 | 0.013 | . | 0.006 | . | 4.12 | . | 0.056 |
| 1 | NCS DC28035 | 65.66 | 0.54 | . | 1.64 | . | 0.056 | . | 0.018 | . | 0.102 | 0.135 | . | . | 0.007 | 0.060 | . | 0.022 | . | 1.92 | 0.048 | . |
| 1 | BAM 630-1 | 65.63 | . | . | 0.88 | . | 0.10 | . | . | . | 0.47 | 0.060 | . | . | . | 0.043 | . | 0.032 | . | 5.88 | . | 0.066 |
| 1 | CAN IOC-1 | 65.62 | 20.76 | . | (0.184) | . | 0.975 | . | (0.004) | . | 1.043 | . | 0.472 | . | . | 0.0120 | . | (0.00657) | . | 2.633 | . | 0.0429 |
| 1 | VS R29/1 | 65.6 | 1.44 | . | 0.34 | . | 0.47 | . | . | . | 0.187 | . | . | . | . | 0.0129 | . | 0.0061 | . | 5.53 | . | . |
| 2 | DH 1114 | 65.55 | 27.20 | . | 0.271 | . | 0.421 | . | 0.061 | . | 0.565 | 0.029 | . | . | 0.078 | . | 0.028 | 0.019 | . | 7.47 | . | 0.060 |
| 2 | IMZ 322 | 65.50 | 26.82 | . | 0.095 | . | 0.26 | . | 0.058 | . | 0.46 | 0.026 | . | . | 0.069 | 0.015 | . | 0.047 | . | 7.56 | . | 0.012 |
| 1 | JSS 805-3 | 65.43 | . | 0.595 | . | 0.0087 | . | 0.0141 | . | 0.0222 | 0.194 | . | . | 0.00431 | . | 0.057 | . | 0.0089 | 0.866 | . | 0.052 | . |
| 2 | IMZ 310 | 65.25 | 1.61 | . | 1.02 | . | 0.30 | . | 0.022 | . | 0.25 | 0.058 | . | . | 0.054 | 0.034 | . | 0.011 | . | 6.58 | . | 0.035 |
| 1 | SRM 693 | 65.08 | . | . | 1.043 | . | 0.0158 | . | 0.00283 | . | 0.0143 | . | 0.0900 | . | 0.0023 | 0.0563 | . | (0.005) | . | 3.860 | . | 0.0345 |
| 1 | JSS 804-3 | 64.91 | . | 0.473 | . | 0.109 | . | . | . | 0.0119 | . | 0.0199 | . | . | . | 0.056 | . | 0.0073 | 2.47 | . | 0.026 | . |
| 1 | IMZ 363 | 64.90 | 0.57 | . | 0.30 | . | 0.372 | . | 0.040 | . | 0.375 | 0.0301 | . | . | 0.112 | 0.0086 | . | 0.004 | . | 6.08 | . | 0.032 |
| 1 | NCS DC28217 | 64.82 | 24.5 | . | 1.30 | . | 0.85 | . | . | . | 0.31 | . | 0.088 | . | . | 0.053 | . | 0.011 | . | 4.91 | . | 0.949 |
| 1 | NCS DC28218 | 64.81 | 25.4 | . | 0.80 | . | 0.65 | . | . | . | 1.78 | . | 0.084 | . | . | 0.026 | . | 0.035 | . | 5.04 | . | 0.477 |
| 2 | DH 1123 | 64.80 | 0.133 | . | 1.619 | . | 0.034 | . | 0.008 | . | 0.037 | 0.049 | . | . | 0.006 | . | 0.123 | 0.011 | . | 2.67 | . | 0.047 |
| 2 | DH 1118 | 64.72 | . | . | 1.785 | . | 0.052 | . | 0.020 | . | 0.057 | 0.713 | . | . | 0.014 | . | 0.141 | 0.009 | . | 1.56 | . | 0.075 |
| 2 | DH 1135 | 64.69 | 0.06 | . | 1.49 | . | 0.011 | . | 0.016 | . | 0.033 | 1.520 | . | . | . | . | 0.140 | 0.006 | . | 0.696 | . | 0.052 |
| 2 | DH 1116 | 64.69 | . | . | 0.722 | . | 1.149 | . | 0.023 | . | 0.400 | 0.198 | . | . | 0.016 | . | 0.058 | . | . | 4.67 | . | 0.078 |
| 1 | NCS DC28052 | 64.53 | 0.28 | . | 0.77 | . | 0.30 | . | 0.038 | . | 0.32 | 0.075 | . | . | 0.054 | 0.025 | . | 0.0053 | . | 5.65 | 0.122 | . |


| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|


| Number | As | Ba | C | $CO_2$ | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | NiO | Pb | V | $V_2O_5$ | Zn | ZnO | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28028 | 0.0012 | . | . | . | . | 0.0008 | 0.003 | . | 0.0014 | 0.0019 | . | 0.0013 | . | . | 0.0044 | . | . | 50 g | |
| IMZ 353 | (0.0007) | . | 0.011 | . | (0.0039) | (0.0018) | 0.0045 | . | 0.0008 | (0.0017) | . | (0.0011) | 0.005 | . | (0.0010) | . | (0.086) | 100 g | |
| SARM 145 | . | BaO:(0.046) | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 0.36 | 100 g | |
| NCS DC28027 | 0.0004 | . | . | . | . | 0.0009 | 0.0015 | . | 0.0085 | 0.0008 | . | 0.0013 | . | . | 0.0032 | . | . | 50 g | |
| NCS DC28223 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| BCS 517 | . | . | 0.061 | . | 0.00075 | . | . | . | 0.0088 | . | . | 0.0028 | 0.0040 | . | 0.0047 | . | 1.898 | 100 g | |
| JSS 805-2 | . | . | . | . | . | . | . | . | 0.0094 | . | . | . | 0.0039 | . | 0.0047 | . | 1.72 | 100 g | |
| GIOP-116 | . | . | . | . | 0.0346 | . | . | . | . | . | . | . | . | . | . | . | 0.404 | 10 g | Zr: 0.0104 |
| NCS DC28005a | . | . | . | . | . | . | . | . | 0.0050 | . | . | . | . | . | 0.0070 | . | . | 50 g | |
| NCS DC28033 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| DH 1137 | . | . | 0.101 | . | . | . | . | 0.017 | . | . | . | . | . | . | . | . | 0.080 | 100 g | $CO_2$: 0.089 |
| ECRM 682-2 | . | . | . | . | . | . | . | . | 0.0005 | . | . | 0.0004 | 0.0015 | . | . | . | . | 100 g | |
| IMZ 358 | (0.0008) | . | 0.030 | . | . | (0.0016) | 0.0034 | . | 0.0008 | (0.0016) | . | (0.0011) | 0.0015 | . | (0.0013) | . | 0.051 | 100 g | |
| VS R1/4 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC28214 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| BS 105 | (0.001) | . | . | . | . | (0.0005) | 0.012 | . | (0.001) | 0.0036 | . | (0.002) | 0.0024 | . | (0.001) | . | . | 100 g | Sn: (0.002) |
| JK 28 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | last | 150 g | $Fe_2O_3$: 91.5 |
| IMZ 362 | . | (0.003) | (0.016) | . | . | (0.0005) | 0.0020 | . | 0.0011 | 0.0010 | . | 0.0017 | . | . | 0.0010 | . | 0.13 | 100 g | |
| VS R37 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| **IMS PBS-204** | 0.001 | (0.004) | . | . | (0.002) | (0.002) | (0.002) | . | (0.003) | (0.002) | . | (0.004) | (0.003) | (0.002) | 0.002 | . | 3.46 | 250 g | **17034** |
| DH 1136 | . | . | 0.016 | 0.030 | . | . | . | 0.025 | . | . | . | . | . | 0.006 | . | 0.003 | 0.057 | 100 g | |
| NCS DC28114 | . | . | . | . | . | . | . | . | 0.016 | . | . | . | . | . | 0.0080 | . | . | 70 g | |
| ECRM 604-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| JSS 850-4 | . | . | . | . | . | . | (0.003) | . | 0.008 | (0.006) | . | . | 0.025 | . | (0.007) | . | . | 100 g | |
| NCS DC28035 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| BAM 630-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| CAN IOC-1 | . | (0.0030) | (0.9) | (3) | (0.003) | (0.001999) | . | 0.0224 | (0.0008) | . | . | (0.0002) | (0.00408) | . | (0.0011) | . | 0.863 | 200 g | |
| VS R29/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| DH 1114 | . | . | 0.125 | . | . | . | . | 0.006 | . | . | . | . | . | 0.002 | . | . | . | 100 g | |
| IMZ 322 | . | 0.0013 | 0.047 | . | . | 0.0008 | 0.0019 | . | . | 0.0014 | . | 0.0011 | 0.0002 | . | 0.0029 | . | 2.25 | 100 g | |
| JSS 805-3 | . | . | . | . | . | . | . | . | 0.0066 | . | . | . | 0.0031 | . | 0.0049 | . | 2.69 | 100 g | |
| IMZ 310 | 0.005 | 0.003 | 0.158 | . | 0.07 | 0.003 | 0.005 | . | 0.0011 | 0.002 | . | 0.0013 | 0.0015 | . | 0.0019 | . | -1.20 | 100 g | |
| SRM 693 | (0.0012) | . | . | . | . | . | (0.0048) | . | . | (0.0009) | . | . | (0.0043) | . | . | . | . | 100 g | |
| JSS 804-3 | 0.0030 | FeII:0.22% | | Combined Waters:0.39% | | | 0.0024 | . | . | 0.0028 | . | . | 0.0025 | . | . | . | . | 100 g | |
| IMZ 363 | . | (0.0011) | (0.013) | . | . | (0.0007) | 0.0032 | . | (0.0011) | 0.0012 | . | (0.0016) | . | . | 0.0011 | . | (0.073) | 100 g | |
| NCS DC28217 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC28218 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| DH 1123 | . | . | 0.058 | . | . | . | . | . | . | . | . | . | . | 0.005 | . | 0.0009 | . | 100 g | |
| DH 1118 | . | . | 0.085 | 0.033 | . | . | . | . | . | . | . | . | . | 0.017 | . | 0.005 | 2.51 | 100 g | |
| DH 1135 | . | . | 0.069 | 0.007 | . | . | . | . | . | . | . | . | . | . | . | . | 2.31 | 100 g | |
| DH 1116 | . | . | 0.016 | 0.026 | . | . | . | 0.038 | . | . | 0.011 | . | . | 0.009 | . | 0.0010 | 0.059 | 100 g | |
| NCS DC28052 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |


| Number | As | Ba | C | $CO_2$ | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | NiO | Pb | V | $V_2O_5$ | Zn | ZnO | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## IRON ORE, chart 3 of 9

# = class, where 1 = CRM and 2 = RM  analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GIOP-127 | 64.499 | . | . | 2.815 | . | 0.1522 | . | 0.0195 | . | 0.0644 | 0.0633 | . | 0.0184 | . | 0.0457 | . | 0.0133 | . | 2.578 | . | 0.0581 |
| 1 | NCS DC14001b | 64.48 | 0.34 | . | 1.26 | . | 0.15 | . | 0.096 | . | 0.041 | 0.087 | . | . | 0.013 | 0.049 | . | 0.018 | . | 3.40 | . | 0.057 |
| 1 | NCS DC28113 | 64.42 | 27.00 | . | 0.90 | . | 1.06 | . | 0.099 | . | 3.28 | 0.109 | . | . | 0.034 | 0.011 | . | 0.381 | . | 3.56 | 0.315 | 0.522 |
| 1 | IMZ 356 | 64.41 | (0.47) | . | 1.63 | . | 0.035 | . | 0.021 | . | 0.057 | 0.765 | . | . | 0.011 | 0.040 | . | 0.0084 | . | 2.85 | . | 0.101 |
| 1 | ECRM 691-1 | 64.39 | . | 0.475 | . | 0.999 | . | 0.0504 | . | 2.022 | . | 0.1734 | . | 0.0164 | . | 0.0877 | . | 0.0632 | 0.556 | . | 0.966 | . |
| 1 | NCS DC14028d | 64.37 | 20.96 | . | 1.10 | . | 1.17 | . | 0.036 | . | 1.30 | 0.147 | . | . | 0.017 | 0.013 | . | 0.371 | . | 2.95 | 0.294 | . |
| 1 | NCS DC93025 | 64.17 | 31.34 | . | 0.29 | . | 0.56 | . | 0.012 | . | 0.49 | 0.032 | . | . | 0.011 | 0.033 | . | 0.624 | . | 9.43 | . | 0.049 |
| 1 | NM 613C | 64.03 | . | . | 3.11 | . | 0.24 | . | . | . | 0.35 | 0.025 | . | . | . | 0.023 | . | 0.013 | 3.63 | . | . | . |
| 1 | VS R15/2 | 64.0 | 28.0 | . | . | . | 0.9 | . | . | . | . | . | . | . | . | . | . | . | . | 2.3 | . | . |
| ~~1~~ | ~~NCS DC28215~~ | ~~63.93~~ | ~~26.9~~ | ~~.~~ | ~~1.09~~ | ~~.~~ | ~~2.06~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.79~~ | ~~.~~ | ~~0.136~~ | ~~.~~ | ~~.~~ | ~~0.017~~ | ~~.~~ | ~~0.282~~ | ~~.~~ | ~~5.90~~ | ~~0.444~~ | ~~.~~ |
| 1 | NCS DC14049 | 63.86 | 0.25 | . | 2.04 | . | 0.084 | . | 0.33 | . | 0.056 | 0.170 | . | . | 0.027 | 0.037 | . | 0.020 | . | 4.62 | . | 0.12 |
| 1 | NCS DC28051 | 63.56 | 0.35 | . | 0.926 | . | 1.12 | . | 0.13 | . | 1.48 | 0.134 | . | . | 0.070 | 0.018 | . | 0.015 | . | 4.57 | 0.071 | . |
| 1 | ASCRM 032 | 63.53 | . | 0.97 | . | 0.040 | . | 0.006 | . | 0.039 | . | 0.071 | . | 0.0085 | . | 0.074 | . | 0.011 | 1.81 | . | 0.043 | . |
| 1 | NCS DC11005a | 63.34 | (0.07) | . | 0.52 | . | 0.12 | . | 0.070 | . | 0.146 | . | 0.84 | . | 0.020 | 0.016 | . | 0.107 | . | 3.36 | . | 0.034 |
| 1 | IMZ 360 | 63.36 | 25.3 | . | 0.356 | . | 2.77 | . | 0.039 | . | 0.63 | 0.098 | . | . | 0.027 | 0.019 | . | 0.074 | . | 5.4 | . | 0.023 |
| 1 | NCS DC11017 | 63.33 | 1.76 | . | 1.13 | . | 1.05 | . | 0.115 | . | 1.30 | . | 0.086 | . | 0.070 | 0.011 | . | 0.0030 | . | 5.56 | . | 0.151 |
| 1 | GIOP-141 | 63.226 | . | . | 1.8 | . | 0.036 | . | 0.0189 | . | 0.1003 | 0.0691 | . | 0.024 | . | 0.0665 | . | 0.0281 | . | 3.548 | . | 0.0574 |
| 1 | NCS DC28224 | 63.20 | 1.4 | . | 1.02 | . | 0.86 | . | . | . | 0.50 | . | 0.083 | . | . | 0.020 | . | 0.015 | . | 6.55 | 0.319 | . |
| 1 | NM 161.6 | 63.18 | . | . | 2.85 | . | . | . | . | . | . | . | . | . | . | 0.067 | . | 0.009 | . | 2.37 | . | 0.10 |
| 2 | DH 1115 | 63.17 | . | . | 2.68 | . | 0.494 | . | 0.008 | . | 0.244 | 0.074 | . | . | 0.020 | . | 0.101 | . | . | 5.79 | . | 0.128 |
| 2 | IMZ 330 | 63.09 | 1.19 | . | 0.13 | . | 1.04 | . | 0.18 | . | 0.23 | 0.012 | . | . | 0.073 | 0.013 | . | 0.003 | . | 8.26 | . | 0.01 |
| 1 | NCS DC28003b | 63.07 | 23.93 | . | 0.64 | . | 0.71 | . | 0.025 | . | 4.82 | . | 1.08 | . | 0.016 | 0.016 | . | 0.024 | . | 3.38 | . | 0.224 |
| 2 | IMZ 331 | 63.05 | 1.55 | . | 0.24 | . | 3.78 | . | 0.092 | . | 0.21 | 0.028 | . | . | 0.037 | 0.015 | . | 0.107 | . | 5.11 | . | 0.017 |
| 1 | GIOP-143 | 62.97 | . | . | 1.49 | . | 0.0348 | . | 0.00942 | . | 0.0475 | 0.1353 | . | 0.0121 | . | 0.064 | . | 0.01731 | . | 3.086 | . | 0.0531 |
| 1 | IMZ 357 | 62.79 | 0.95 | . | 1.07 | . | 0.060 | . | 0.012 | . | 0.047 | 0.173 | . | . | 0.0098 | 0.058 | . | 0.0064 | . | 7.08 | . | 0.081 |
| 1 | JSS 806-1 | 62.77 | . | 0.96 | . | 0.0197 | . | 0.0091 | . | 0.034 | . | 0.125 | . | 0.0115 | . | 0.083 | . | 0.019 | 1.55 | . | 0.044 | . |
| 1 | IMZ 354 | 62.76 | 1.41 | . | 1.48 | . | 1.31 | . | 0.15 | . | 0.49 | 0.390 | . | . | 0.096 | 0.028 | . | 0.0149 | . | 4.78 | . | 0.68 |
| 1 | GIOP-44 | 62.75 | . | . | 2.216 | . | 0.0255 | . | 0.0127 | . | 0.0571 | 0.0709 | . | (0.02) | . | 0.06267 | . | 0.0199 | . | 4.55 | . | 0.1064 |
| ~~1~~ | ~~VS 5403-90~~ | ~~62.74~~ | ~~25.74~~ | ~~.~~ | ~~0.73~~ | ~~.~~ | ~~0.89~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.65~~ | ~~0.162~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~3.89~~ | ~~.~~ | ~~7.14~~ | ~~.~~ | ~~0.055~~ |
| 1 | NCS DC28003a | 62.65 | 24.53 | . | 0.39 | . | 0.71 | . | 0.040 | . | 4.73 | . | 0.113 | . | 0.013 | 0.011 | . | 0.114 | . | 4.20 | . | 0.117 |
| 1 | NCS DC28110 | 62.63 | 23.21 | . | 1.19 | . | 1.09 | . | 0.068 | . | 5.21 | 0.170 | . | . | 0.028 | 0.017 | . | 0.255 | . | 3.15 | 0.096 | 0.160 |
| 1 | ASCRM 031 | 62.53 | . | 0.80 | . | 0.011 | . | 0.005 | . | 0.035 | . | 0.110 | . | 0.0010 | . | 0.062 | . | 0.025 | 1.29 | . | 0.032 | . |
| 1 | GIOP-37 | 62.53 | . | . | 2.037 | . | 0.0341 | . | 0.0146 | . | 0.0446 | 0.0959 | . | 0.015 | . | 0.1097 | . | 0.0159 | . | 3.877 | . | 0.0615 |
| 1 | NCS DC73007 | 62.51 | 21.54 | . | 1.02 | . | 0.18 | . | 0.037 | . | 0.28 | 0.061 | . | . | 0.016 | 0.11 | . | 0.0058 | . | 10.93 | 0.059 | . |
| 1 | JSS 803-8 | 62.47 | . | 0.797 | . | 0.0277 | . | 0.00561 | . | 0.029 | 0.090 | 0.00633 | . | . | . | 0.089 | . | 0.0153 | 1.52 | . | 0.037 | . |

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |

| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIOP-127 | 0.0066 | 0.0072 | . | 0.0066 | (0.0034) | 0.007 | . | 0.0024 | 0.0042 | 0.0065 | 0.01274 | . | 0.0023 | (0.0028) | 1.834 | 10 g | Sr: 0.0036 |
| NCS DC14001b | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC28113 | 0.013 | . | . | . | . | . | . | 0.047 | . | . | . | . | 0.0096 | . | . | 70 g | |
| IMZ 356 | . | 0.028 | 0.043 | (0.0087) | (0.0023) | 0.0028 | . | 0.0109 | . | 0.0015 | 0.0052 | . | 0.0066 | . | 2.37 | 100 g | |
| ECRM 691-1 | Fe II: 20.71 | | 0.307 | . | . | 0.0095 | . | 0.0768 | 0.0299 | 0.0008 | 0.0603 | . | 0.0195 | . | . | 100 g | |
| NCS DC14028d | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC93025 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NM 613C | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| VS R15/2 | . | . | . | . | . | . | . | . | . | . | . | 0.6 | . | . | . | 100 g | |
| ~~NCS DC28215~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~50 g~~ | |
| NCS DC14049 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 65 g | |
| NCS DC28051 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| ASCRM 032 | 0.0018 | 0.0037 | . | 0.0080 | 0.0008 | 0.0022 | . | 0.0009 | 0.0011 | 0.0008 | 0.0022 | . | 0.0022 | 0.0019 | 2.90 | 10x10 g | Sn: 0.0013 Sr: 0.0008 |
| NCS DC11005a | 0.0044 | (0.62 BaO) | 0.119 | . | 0.0031 | . | . | 0.034 | . | 0.035 | . | . | 0.026 | . | . | 50 g | |
| IMZ 360 | . | 0.0033 | 0.69 | . | (0.0011) | 0.0077 | . | 0.007 | 0.0041 | 0.011 | (0.0013) | . | 0.28 | . | (-0.30) | 100 g | |
| NCS DC11017 | (0.0006) | . | . | . | . | . | . | 0.0045 | . | (0.0006) | . | . | 0.0058 | . | . | 70 g | |
| GIOP-141 | 0.00195 | (0.004) | . | 0.0103 | 0.00159 | 0.0154 | . | 0.0043 | 0.0055 | (0.0034) | 0.0022 | . | 0.00282 | 0.0027 | 3.687 | 10 g | Sr: 0.0027 |
| NCS DC28224 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NM 161.6 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| DH 1115 | . | . | . | . | . | . | 0.005 | . | . | . | . | 0.010 | . | . | . | 100 g | |
| IMZ 330 | . | (0.003) | 0.016 | . | . | 0.003 | . | 0.0017 | (0.002) | 0.0016 | . | . | 0.002 | . | -0.04 | 100 g | |
| NCS DC28003b | . | . | . | . | . | . | . | . | . | . | . | . | 0.055 | . | . | 50 g | |
| IMZ 331 | (0.0004) | 0.0025 | . | . | 0.001 | 0.0051 | . | 0.0016 | 0.002 | 0.002 | 0.003 | . | 0.003 | . | 0.22 | 100 g | Sn: 11* |
| GIOP-143 | (0.0016) | (0.0059) | . | 0.009 | 0.00187 | (0.0016) | . | (0.0021) | (0.0028) | (0.004) | 0.0016 | . | 0.00168 | (0.0018) | 4.898 | 10 g | Sr: 0.0029 |
| IMZ 357 | (0.0006) | (0.0064) | 0.054 | . | . | 0.0039 | . | 0.0014 | (0.0019) | (0.0014) | 0.0047 | . | 0.0019 | . | 2.14 | 100 g | |
| JSS 806-1 | . | . | . | . | . | 0.0033 | . | 0.0012 | 0.0013 | . | 0.0018 | . | 0.0020 | . | 4.4 | 150 g | FeII: 0.15 |
| IMZ 354 | . | (0.0042) | 0.251 | (0.0046) | (0.0023) | 0.0064 | . | 0.0016 | (0.0017) | (0.0009) | 0.013 | . | 0.0017 | . | 0.97 | 100 g | |
| GIOP-44 | . | . | . | 0.0082 | . | 0.0033 | . | 0.0026 | . | . | . | . | . | . | 2.929 | 10 g | |
| ~~VS 5403-90~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.32~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.029~~ | ~~.~~ | ~~.~~ | ~~50 g~~ | ~~Ag: 5.9* $CO_2$: 0.39~~ |
| NCS DC28003a | . | . | . | . | . | . | . | 0.0071 | . | . | . | . | 0.0085 | . | . | 50 g | |
| NCS DC28110 | . | . | . | . | . | . | . | 0.018 | . | . | . | . | 0.010 | . | . | 70 g | |
| ASCRM 031 | 0.0011 | 0.0029 | . | 0.0106 | 0.0012 | 0.0026 | . | 0.0011 | 0.0013 | 0.0006 | 0.0013 | . | 0.0018 | 0.0014 | 5.80 | 10x10 g | Sn: 0.0013 Sr: 0.0001 |
| GIOP-37 | . | . | . | 0.0109 | . | . | . | . | . | . | . | . | . | . | 4.021 | 10 g | |
| NCS DC73007 | . | . | . | . | . | . | . | (0.0015 | . | . | . | . | . | . | . | 50 g | |
| JSS 803-8 | . | . | . | . | . | 0.0029 | . | 0.00068 | 0.0012 | . | 0.0018 | . | 0.0023 | . | (5.06) | 100 g | FeII: 0.183% |

| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other |

**CRM** **IRON ORE, chart 4 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GIOP-56 | 62.41 | . | . | 1.969 | . | 0.0369 | . | 0.0184 | . | 0.0513 | 0.2196 | . | 0.0174 | . | 0.0902 | . | 0.0164 | . | 3.594 | . | 0.06 |
| 1 | GIOP-43 | 62.39 | . | . | 2.368 | . | 0.028 | . | 0.0134 | . | 0.0623 | 0.0821 | . | (0.012) | . | 0.0587 | . | 0.024 | . | 4.707 | . | 0.1213 |
| 1 | IMS PBS-72 | 62.38 | . | . | 2.14 | . | 0.053 | . | 0.041 | . | (0.081) | 0.404 | . | . | (0.023) | 0.064 | . | (0.020) | . | 3.65 | . | 0.105 |
| ~~1~~ | ~~NCS DC15005~~ | ~~62.36~~ | ~~0.48~~ | ~~.~~ | ~~2.56~~ | ~~.~~ | ~~0.050~~ | ~~.~~ | ~~0.015~~ | ~~.~~ | ~~0.062~~ | ~~.~~ | ~~0.112~~ | ~~.~~ | ~~0.015~~ | ~~0.073~~ | ~~.~~ | ~~0.022~~ | ~~.~~ | ~~4.69~~ | ~~.~~ | ~~0.113~~ |
| 1 | ASCRM 035 | 62.35 | . | 0.72 | . | 0.117 | . | 0.022 | . | 0.150 | . | 0.152 | . | 0.0565 | . | 0.078 | . | 0.057 | 1.99 | . | 0.046 | . |
| 1 | NCS DC28026 | 62.27 | 0.59 | . | 2.39 | . | 0.144 | . | 0.023 | . | 0.156 | 0.17 | . | . | 0.024 | 0.078 | . | 0.02 | . | 4.2 | 0.055 | . |
| 1 | IRSID 611-1 | 62.22 | . | 0.69 | . | 2.85 | . | . | . | 0.32 | . | 1.97 | . | . | . | 0.030 | . | (0.008) | 2.07 | . | 0.033 | . |
| 1 | USZ 27-99 | 62.2 | 21.06 | . | 1.37 | . | 0.56 | . | 0.07 | . | 2.78 | . | 0.105 | . | (0.04) | . | (0.016) | . | . | 3.37 | . | 0.101 |
| 1 | SARM 132 | 62.2 | . | . | 1.84 | . | (0.086) | . | 0.219 | . | . | . | (0.0200) | . | (0.031) | 0.054 | . | . | . | 7.82 | . | (0.094) |
| 1 | GIOP-38 | 62.15 | . | . | 2.008 | . | 0.0407 | . | 0.023 | . | 0.07 | 0.5627 | . | 0.0195 | . | 0.0515 | . | 0.0256 | . | 3.101 | . | 0.0687 |
| 1 | NCS DC28025 | 62.11 | 0.58 | . | 2.06 | . | 0.021 | . | 0.023 | . | 0.101 | 0.65 | . | . | 0.013 | 0.067 | . | 0.013 | . | 2.92 | 0.051 | . |
| 2 | IMZ 332 | 62.10 | 1.61 | . | 0.32 | . | 0.39 | . | 0.117 | . | 0.71 | 0.026 | . | . | 0.050 | 0.010 | . | 0.003 | . | 9.63 | . | 0.027 |
| 1 | NCS DC28216 | 62.01 | 26.9 | . | 1.46 | . | 3.65 | . | . | . | 1.10 | . | 0.176 | . | . | 0.020 | . | 0.258 | . | 6.74 | 0.388 | . |
| 1 | DSZU RG36 | 62.01 | 0.67 | . | 0.84 | . | 0.051 | . | 0.017 | . | 0.48 | . | 0.026 | . | 0.079 | 0.015 | . | 0.0068 | . | 9.43 | . | 0.037 |
| 1 | NCS DC11009a | 61.96 | 15.13 | . | 0.914 | . | 0.375 | . | 0.093 | . | 0.364 | . | 0.947 | . | 0.024 | 0.027 | . | 0.212 | . | 4.92 | . | 0.447 |
| 1 | GIOP-47 | 61.9 | . | . | 1.88 | . | 0.0151 | . | 0.0064 | . | 0.041 | 0.0782 | . | (0.015) | . | 0.0688 | . | 0.0199 | . | 2.809 | . | 0.0614 |
| 2 | IMZ 333 | 61.87 | 1.65 | . | 0.33 | . | 0.34 | . | 0.11 | . | 0.73 | 0.034 | . | . | 0.057 | 0.008 | . | 0.001 | . | 10.07 | . | 0.026 |
| 1 | GIOP-41 | 61.85 | . | . | 1.978 | . | 0.0368 | . | 0.0113 | . | 0.053 | 0.1078 | . | 0.018 | . | 0.1109 | . | 0.0335 | . | 3.043 | . | 0.0762 |
| 1 | NCS DC28031 | 61.82 | 0.55 | . | 2.26 | . | 0.024 | . | 0.024 | . | 0.085 | 0.61 | . | . | 0.012 | 0.073 | . | 0.012 | . | 2.94 | 0.054 | . |
| 1 | NCS DC18011 | 61.80 | 0.30 | . | 3.05 | . | 0.051 | . | . | . | 0.102 | . | 0.170 | . | . | 0.076 | . | 0.022 | . | 4.52 | . | 0.134 |
| 1 | IMZ 359 | 61.74 | 3.17 | . | 0.25 | . | 2.93 | . | 0.061 | . | 0.86 | 0.028 | . | . | 0.079 | 0.0078 | . | 0.017 | . | 7.75 | . | 0.021 |
| ~~1~~ | ~~NCS DC14033~~ | ~~61.73~~ | ~~1.51~~ | ~~.~~ | ~~0.48~~ | ~~.~~ | ~~0.11~~ | ~~.~~ | ~~0.056~~ | ~~.~~ | ~~0.055~~ | ~~0.027~~ | ~~.~~ | ~~.~~ | ~~0.0056~~ | ~~0.024~~ | ~~.~~ | ~~0.036~~ | ~~.~~ | ~~9.82~~ | ~~0.041~~ | ~~.~~ |
| 1 | GIOP-42 | 61.7 | . | . | 1.896 | . | 0.0172 | . | (0.0049) | . | 0.045 | 0.0541 | . | 0.018 | . | 0.0618 | . | 0.0137 | . | 2.743 | . | 0.0674 |
| 1 | GIOP-46 | 61.699 | . | . | 1.854 | . | 0.0159 | . | (0.0056) | . | 0.045 | 0.0685 | . | (0.012) | . | 0.0684 | . | 0.0152 | . | 3.064 | . | 0.0656 |
| 1 | NCS DC28053 | 61.68 | 0.24 | . | 0.84 | . | 0.33 | . | 0.071 | . | 0.38 | 0.042 | . | . | 0.046 | 0.017 | . | 0.020 | . | 10.32 | 0.063 | . |
| 1 | GIOP-121 | 61.609 | . | . | 2.174 | . | 0.0207 | . | 0.0093 | . | 0.049 | 0.1915 | . | 0.011 | . | 0.0629 | . | 0.0168 | . | 2.986 | . | 0.0588 |
| 1 | ASCRM 034 | 61.59 | . | 1.19 | . | 0.029 | . | 0.012 | . | 0.040 | . | 0.141 | . | 0.0117 | . | 0.082 | . | 0.024 | 2.00 | . | 0.054 | . |
| 1 | GIOP-82 | 61.58 | . | . | 1.255 | . | 0.02 | . | 0.0097 | . | 0.04 | 0.2102 | . | 0.0172 | . | 0.0524 | . | 0.0155 | . | 3.079 | . | 0.697 |
| 1 | NCS DC28024 | 61.53 | 0.24 | . | 2.12 | . | 0.118 | . | 0.026 | . | 0.109 | 0.276 | . | . | 0.034 | 0.068 | . | 0.038 | . | 3.43 | 0.052 | . |
| 1 | GIOP-25 | 61.5 | . | . | 3.58 | . | (<0.05) | . | 0.028 | . | 0.055 | 0.023 | . | . | . | 0.023 | . | 0.017 | . | 5.28 | . | 0.135 |
| 1 | NCS DC73006 | 61.46 | (0.35) | . | 1.68 | . | 0.52 | . | 0.098 | . | 0.77 | 0.072 | . | . | 0.080 | 0.019 | . | (0.0067) | . | 6.65 | 1.12 | . |
| 2 | IMZ 340 | 61.45 | 3.40 | . | 2.37 | . | 1.22 | . | (0.020) | . | 2.40 | 0.15 | . | . | 0.066 | (0.002) | . | . | . | 4.20 | . | 2.45 |
| 1 | OREAS 406 | 61.44 | . | . | 1.14 | . | 0.157 | . | 0.019 | . | (0.037) | . | 0.039 | . | (0.017) | 0.085 | . | (0.006) | . | 7.96 | . | 0.047 |
| 1 | ECRM 688-1 | 61.38 | . | 0.679 | . | 1.449 | . | 0.180 | . | 1.061 | . | 0.0457 | . | 0.333 | . | 0.337 | . | (0.0468) | 3.383 | . | 0.408 | . |
| 1 | NCS DC93023 | 61.34 | 29.68 | . | 0.45 | . | 0.64 | . | 0.018 | . | (0.60) | 0.056 | . | . | 0.012 | 0.036 | . | 0.494 | . | 12.36 | . | 0.064 |
| 1 | GIOP-62 | 61.3 | . | . | 2.254 | . | 0.0628 | . | 0.0476 | . | 0.085 | 0.308 | . | 0.0209 | . | 0.0537 | . | 0.0348 | . | 4.282 | . | 0.1592 |
| 1 | GIOP-115 | 61.28 | . | . | 1.748 | . | 0.2298 | . | 0.0205 | . | 0.1622 | 0.0166 | . | 0.0595 | . | 0.00882 | . | 0.0073 | . | 9.046 | . | 0.199 |
| 1 | IMZ 361 | 61.16 | 3.4 | . | 2.60 | . | 0.074 | . | 0.0059 | . | 0.027 | 0.054 | . | . | 0.005 | 0.082 | . | 0.015 | . | 5.6 | . | 0.072 |
| 1 | GIOP-51 | 61.126 | . | . | 2.096 | . | 0.0287 | . | 0.0114 | . | 0.049 | 0.274 | . | 0.0134 | . | 0.0665 | . | 0.0196 | . | 3.133 | . | 0.063 |
| 1 | BAM 631-1 | 61.09 | . | . | 1.06 | . | 0.75 | . | (0.04) | . | 0.54 | 0.044 | . | . | (0.04) | 0.114 | . | 0.033 | . | 3.20 | . | 0.109 |
| 1 | GIOP-124 | 61.051 | . | . | 2.529 | . | 0.0148 | . | 0.012 | . | 0.0679 | 0.0769 | . | 0.0193 | . | 0.0667 | . | 0.0178 | . | 3.535 | . | 0.0735 |
| 1 | NCS DC28030 | 60.82 | 0.21 | . | 2.27 | . | 0.035 | . | 0.022 | . | 0.112 | 0.298 | . | . | 0.026 | 0.073 | . | 0.041 | . | 3.45 | 0.056 | . |
| 1 | **IMS PBS-203** | 60.67 | . | . | 1.62 | . | 0.067 | . | 0.215 | . | 0.096 | 4.29 | . | . | 0.056 | 0.041 | . | 0.017 | . | 2.20 | . | 0.101 |
| ~~1~~ | ~~GIOP-18~~ | ~~60.64~~ | ~~.~~ | ~~.~~ | ~~2.4~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.056~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~4.74~~ | ~~.~~ | ~~0.04~~ |

# Number Fe FeO Al $Al_2O_3$ Ca CaO K $K_2O$ Mg MgO Mn MnO Na $Na_2O$ P $P_2O_5$ S Si $SiO_2$ Ti $TiO_2$

| Number | As | Ba | C | $CO_2$ | Cl | Co | Cr | $Cr_2O_2$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIOP-56 | . | . | . | . | 0.014 | 0.007 | 0.0038 | . | . | . | . | . | . | 0.00237 | . | 4.076 | 10 g | | |
| GIOP-43 | . | . | . | . | 0.0088 | . | 0.0038 | . | 0.0027 | . | . | . | . | . | . | 3.167 | 10 g | | |
| IMS PBS-72 | (0.002) | (0.011) | . | . | (0.013) | (0.001) | (0.005) | . | (0.002) | (0.003) | (0.002) | 0.020 | . | (0.005) | (0.003) | 3.89 | 250 g | Sr: 0.059 | |
| ~~NCS DC15005~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0019~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | | |
| ASCRM 035 | 0.0079 | 0.0017 | . | . | 0.0398 | 0.0018 | 0.0048 | . | 0.0087 | 0.0033 | 0.0005 | 0.0024 | . | 0.0029 | 0.0023 | 4.02 | 10x10 g | Sn: 0.0011 | Sr: 0.0009 |
| NCS DC28026 | 0.0013 | . | . | . | . | 0.001 | 0.0027 | . | 0.0015 | 0.0024 | 0.0004 | . | . | 0.0026 | . | . | 50 g | | |
| IRSID 611-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | | |
| USZ 27-99 | . | . | . | . | . | 0.013 | . | . | 0.030 | 0.008 | . | . | . | (0.013) | . | (1.46) | 100 g | | |
| SARM 132 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | | |
| GIOP-38 | . | . | . | . | 0.0124 | . | 0.0078 | . | . | . | . | . | . | . | . | 4.87 | 10 g | | |
| NCS DC28025 | 0.0011 | . | . | . | . | 0.0015 | 0.0038 | . | 0.0018 | 0.0033 | 0.0008 | . | . | 0.0026 | . | . | 50 g | | |
| IMZ 332 | . | 0.0036 | 0.012 | . | . | . | 0.005 | . | 0.0021 | 0.002 | 0.0016 | (0.001) | . | 0.0023 | . | 0.11 | 100 g | | |
| NCS DC28216 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | | |
| DSZU RG36 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | (1.1) | 150 g | Insoluble Residue: 10.0% | |
| NCS DC11009a | 0.011 | . | 0.128 | . | . | 0.0061 | . | . | 0.063 | . | 0.042 | . | . | 0.054 | . | . | 50 g | BaO: (0.71) | |
| GIOP-47 | . | . | . | . | . | . | 0.00263 | . | . | . | . | . | . | . | . | 6.309 | 10 g | | |
| IMZ 333 | . | 0.003 | 0.011 | . | . | . | 0.006 | . | 0.002 | 0.002 | 0.0015 | 0.001 | . | 0.0014 | . | 0.13 | 100 g | | |
| GIOP-41 | . | . | . | . | 0.0125 | . | . | . | . | . | . | . | . | . | . | 5.784 | 10 g | | |
| NCS DC28031 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | | |
| NCS DC18011 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | | |
| IMZ 359 | . | (0.0016) | 0.036 | . | 0.018 | (0.0014) | 0.0023 | . | (0.0006) | . | (0.0010) | 0.0009 | . | 0.0018 | . | -0.13 | 100 g | | |
| ~~NCS DC14033~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0048~~ | ~~.~~ | ~~.~~ | ~~0.061~~ | ~~0.0023~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~50 g~~ | | |
| GIOP-42 | . | . | . | . | . | . | 0.00222 | . | 0.0032 | . | . | . | . | . | . | 6.76 | 10 g | | |
| GIOP-46 | . | . | . | . | . | . | 0.0023 | . | 0.0027 | . | . | . | . | . | . | 6.385 | 10 g | | |
| NCS DC28053 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | | |
| GIOP-121 | (0.0014) | (0.0056) | . | . | 0.0088 | (0.0015) | (0.0017) | . | (0.0016) | (0.0026) | (0.0012) | (0.001) | . | (0.0017) | (0.0021) | 6.237 | 10 g | | |
| ASCRM 034 | 0.0011 | 0.0055 | . | . | 0.0110 | 0.0009 | 0.0022 | . | 0.0009 | 0.0015 | 0.0012 | 0.0021 | . | 0.0016 | 0.0021 | 4.76 | 10x10 g | Sn: 0.0005 | Sr: 0.0013 |
| GIOP-82 | . | . | . | . | 0.0118 | . | . | . | . | . | 0.013 | . | . | . | . | 6.411 | 10 g | | |
| NCS DC28024 | 0.0011 | . | . | . | . | 0.0009 | 0.0054 | . | 0.0014 | 0.0027 | 0.0008 | . | . | 0.002 | . | . | 50 g | | |
| GIOP-25 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 2.72 | 10 g | | |
| NCS DC73006 | . | . | . | . | . | . | . | . | 0.0028 | . | . | . | . | . | . | . | 50 g | | |
| IMZ 340 | . | . | . | . | . | . | (0.068) | . | . | . | . | 0.30 | . | . | . | . | 100 g | | |
| OREAS 406 | (0.001) | (0.00374) | . | . | (0.006) | (0.0009) | . | (0.002) | (0.0019) | (0.0058) | (0.00196) | (0.00114) | . | (0.00174) | (0.003) | 2.69 | 10 g | | |
| ECRM 688-1 | (0.0011) | . | . | . | . | 0.0096 | (0.002) | . | 0.0023 | 0.0136 | 0.00025 | 0.135 | . | 0.0015 | (0.0015) | . | 100 g | | |
| NCS DC93023 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | | |
| GIOP-62 | 0.0068 | 0.0075 | . | . | 0.0184 | . | 0.0143 | . | . | . | . | 0.02073 | . | 0.0064 | . | 4.71 | 10 g | | |
| GIOP-115 | . | . | . | . | 0.0536 | . | . | . | . | . | . | 0.00314 | . | . | 0.0187 | 0.817 | 10 g | | |
| IMZ 361 | . | 0.003 | 0.288 | . | . | (0.0005) | 0.0031 | . | (0.0013) | 0.0013 | 0.0015 | (0.0013) | . | 0.0031 | . | 4.37 | 100 g | | |
| GIOP-51 | . | . | . | . | 0.016 | . | . | . | . | . | . | . | . | . | . | 6.629 | 10 g | | |
| BAM 631-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | | |
| GIOP-124 | (0.0014) | (0.0036) | . | . | 0.0136 | (0.0027) | 0.00166 | . | (0.0021) | 0.0022 | (0.0025) | (0.00096) | . | 0.0028 | (0.0028) | 6.203 | 10 g | Sr: 0.0034 | |
| NCS DC28030 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | | |
| **IMS PBS-203** | 0.003 | (0.024) | . | . | (0.023) | (0.004) | (0.004) | . | 0.003 | (0.008) | (0.003) | (0.009) | . | 0.009 | (0.003) | 2.93 | 250 g | Sr: 0.009 | **17034** |
| ~~GIOP-18~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~5.5~~ | ~~10 g~~ | | |

Number As Ba C $CO_2$ Cl Co Cr $Cr_2O_2$ Cu Ni Pb V $V_2O_5$ Zn Zr LOI Units Other

**CRM** **IRON ORE, chart 5 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GIOP-161 | 60.48 | . | . | 2.116 | . | 0.0234 | . | 0.00935 | . | 0.174 | 0.2674 | . | (0.01) | . | 0.0622 | 0.0189 | . | 2.911 | . | 1.63 |
| 1 | GIOP-89 | 60.42 | . | . | 1.702 | . | 0.0606 | . | 0.0106 | . | 0.086 | 0.1927 | . | 0.0178 | . | 0.048 | 0.0155 | . | 3.922 | . | 0.344 |
| 1 | NCS DC28002a | 60.37 | 21.03 | . | 3.54 | . | 1.49 | . | 0.090 | . | 1.23 | . | 0.236 | . | 0.102 | 0.043 | 0.016 | . | 7.40 | . | 0.751 |
| 2 | IMZ 342 | 60.32 | 20.1 | . | 0.48 | . | 4.51 | . | 0.058 | . | 0.86 | 0.080 | . | . | 0.042 | 0.017 | 0.15 | . | 5.93 | . | 0.045 |
| 1 | GIOP-122 | 60.31 | . | . | 2.498 | . | 0.0337 | . | 0.0298 | . | 0.067 | 0.2252 | . | 0.0254 | . | 0.0637 | 0.0814 | . | 3.937 | . | 0.0848 |
| 1 | GIOP-145 | 60.21 | . | . | 2.017 | . | 0.0291 | . | 0.00923 | . | 0.0654 | 0.2292 | . | 0.0131 | . | 0.05915 | 0.01967 | . | 3.571 | . | 0.0787 |
| 1 | GIOP-87 | 60.16 | . | . | 2.247 | . | 0.0298 | . | (0.0094) | . | 0.0482 | 0.0344 | . | (0.014) | . | 0.0976 | 0.0114 | . | 3.147 | . | 0.096 |
| 1 | ECRM 680-1 | 59.98 | . | 0.66 | . | 0.45 | . | 0.078 | . | 0.14 | . | 0.025 | . | 0.128 | . | 0.018 | 0.544 | 4.20 | . | 0.045 | . |
| 1 | GIOP-45 | 59.93 | . | . | 2.024 | . | 0.0486 | . | 0.0123 | . | 0.0789 | 0.1189 | . | 0.0185 | . | 0.0505 | 0.0248 | . | 4.991 | . | 0.1078 |
| 1 | GIOP-67 | 59.91 | . | . | 2.107 | . | 0.0528 | . | (0.009) | . | 0.112 | 0.1811 | . | 0.0165 | . | 0.0346 | 0.0198 | . | 4.849 | . | 0.0914 |
| 2 | IMZ 262/1 | 59.73 | . | . | 0.71 | . | 0.42 | . | . | . | 0.83 | (0.04) | 0.044 | . | . | (0.016) | (0.005) | . | 12.28 | . | . |
| 1 | NCS DC28036 | 59.71 | 0.62 | . | 2.76 | . | 0.317 | . | 0.042 | . | 0.233 | 0.192 | . | . | 0.086 | 0.078 | 0.090 | . | 5.18 | 0.066 | . |
| 1 | GIOP-85 | 59.66 | . | . | 1.581 | . | 0.0496 | . | 0.00962 | . | 0.1054 | 0.2429 | . | 0.0168 | . | 0.044 | 0.0131 | . | 3.614 | . | 0.054 |
| 1 | IRSID 606-1 | 59.66 | . | 0.34 | . | 1.04 | . | . | . | 0.32 | . | 2.59 | . | . | . | 0.026 | 0.033 | 1.04 | . | 0.019 | . |
| 1 | GIOP-70 | 59.62 | . | . | 1.741 | . | 0.0834 | . | 0.0104 | . | 0.071 | 0.1706 | . | 0.0139 | . | 0.0413 | 0.0225 | . | 4.311 | . | 0.0588 |
| 1 | SRM 692 | 59.6 | . | . | 1.42 | . | 0.022 | . | 0.039 | . | 0.036 | . | 0.458 | . | 0.007 | 0.038 | (0.005) | . | 10.17 | . | 0.044 |
| 1 | NCS DC19003b | 59.51 | 26.53 | . | 3.36 | . | 0.055 | . | . | . | 1.34 | . | 0.43 | . | . | 0.0049 | 0.013 | . | 1.40 | . | 10.21 |
| 1 | GIOP-69 | 59.49 | . | . | 1.574 | . | 0.337 | . | 0.0162 | . | 0.089 | 0.2574 | . | 0.0301 | . | 0.0407 | 0.0598 | . | 3.346 | . | 0.0484 |
| 1 | GIOP-66 | 59.49 | . | . | 1.553 | . | 0.0926 | . | 0.0107 | . | 0.052 | 0.1609 | . | (0.013) | . | 0.0439 | 0.0232 | . | 4.099 | . | 0.0454 |
| 1 | GIOP-71 | 59.48 | . | . | 1.591 | . | 0.2672 | . | 0.0151 | . | 0.075 | 0.234 | . | 0.0223 | . | 0.0415 | 0.0474 | . | 3.571 | . | 0.0486 |
| 1 | KZ 184-89 | 59.44 | 20.34 | . | 1.01 | . | 1.35 | . | 0.16 | . | 0.22 | 0.36 | . | . | . | 0.031 | 1.08 | . | 7.99 | . | 0.052 |
| 1 | GIOP-144 | 59.43 | . | . | 1.81 | . | 0.0917 | . | 0.0109 | . | 0.0598 | 0.1963 | . | 0.0123 | . | 0.0475 | 0.0274 | . | 4.247 | . | 0.0627 |
| 1 | GIOP-147 | 59.17 | . | . | 2.108 | . | 0.0295 | . | 0.0119 | . | 0.0659 | 0.1211 | . | (0.0092) | . | 0.0816 | 0.0217 | . | 4.449 | . | 0.2036 |
| 1 | GIOP-76 | 59.2 | . | . | 2.435 | . | 0.0324 | . | (0.0092) | . | 0.051 | 0.0577 | . | (0.013) | . | 0.1237 | 0.0092 | . | 4.02 | . | 0.1096 |
| 1 | GIOP-74 | 59.19 | . | . | 2.331 | . | 0.429 | . | 0.0184 | . | 0.108 | 0.0809 | . | 0.0227 | . | 0.0503 | 0.0371 | . | 4.565 | . | 0.113 |
| 1 | GIOP-84 | 59.13 | . | . | 2.435 | . | 0.0504 | . | 0.0195 | . | 0.0602 | 0.354 | . | 0.0164 | . | 0.04696 | 0.0274 | . | 5.428 | . | 0.2216 |
| 1 | IMZ 355 | 59.11 | 3.86 | . | 1.92 | . | 0.071 | . | 0.007 | (0.030) | . | 0.083 | . | . | 0.011 | 0.090 | 0.013 | . | 10.06 | . | 0.057 |
| 1 | GIOP-88 | 59.11 | . | . | 2.081 | . | 0.097 | . | 0.010 | . | 0.1264 | 0.125 | . | 0.0185 | . | 0.04453 | 0.0146 | . | 4.593 | . | 0.399 |
| 1 | GIOP-148 | 58.9 | . | . | 2.324 | . | 0.1025 | . | 0.0117 | . | 0.0594 | 0.1869 | . | 0.0131 | . | 0.0807 | 0.0302 | . | 4.452 | . | 0.1091 |
| 1 | GIOP-138 | 58.89 | . | . | 3.261 | . | 0.0311 | . | 0.0123 | . | 0.0606 | 0.1264 | . | 0.0128 | . | 0.0535 | 0.287 | . | 4.487 | . | 0.1628 |
| 1 | NCS DC14010b | 58.84 | 18.69 | . | 2.30 | . | 1.82 | . | 0.214 | . | 1.18 | 0.60 | . | . | 0.057 | 0.022 | 0.088 | . | 7.73 | . | 0.460 |
| 1 | NCS DC13034 | 58.79 | 26.09 | . | 0.54 | . | 1.77 | . | . | . | 0.30 | . | 0.061 | . | . | 0.584 | 0.047 | . | 14.47 | . | 0.014 |
| 2 | IMZ 311 | 58.65 | 0.78 | . | 1.03 | . | 0.048 | . | 0.065 | . | 0.06 | 0.018 | . | . | 0.23 | 0.048 | 0.015 | . | 13.58 | . | 0.039 |
| 1 | GIOP-17 | 58.48 | . | . | 3.3 | . | . | . | . | . | . | . | . | . | . | 0.060 | . | . | 6.13 | . | 0.06 |
| 1 | ASCRM 033 | 58.45 | . | 0.80 | . | 0.047 | . | 0.002 | . | 0.058 | . | 0.029 | . | 0.0068 | . | 0.052 | 0.007 | 2.28 | . | 0.041 | . |
| 1 | NCS DC28040 | 58.40 | 3.11 | . | 2.04 | . | 4.41 | . | 0.048 | . | 1.17 | 0.269 | . | . | 0.039 | 0.063 | 0.038 | . | 5.06 | 0.084 | . |
| 1 | GIOP-125 | 58.292 | . | . | 3.916 | . | 0.0115 | . | 0.0304 | . | 0.0996 | 0.1876 | . | 0.0125 | . | 0.068 | 0.009 | . | 4.37 | . | 0.146 |
| 1 | GIOP-81 | 58.21 | . | . | 2.559 | . | 0.095 | . | 0.01014 | . | 0.1224 | 0.0728 | . | 0.0166 | . | 0.0784 | 0.012 | . | 4.947 | . | 0.1288 |
| 1 | GIOP-79 | 58.06 | . | . | 2.231 | . | 0.035 | . | 0.01039 | . | 0.067 | 0.0731 | . | (0.019) | . | 0.1131 | 0.0088 | . | 5.592 | . | 0.0927 |
| 1 | OREAS 405 | 58.02 | . | . | 2.26 | . | 0.196 | . | 0.020 | . | (0.062) | . | 0.030 | . | (0.014) | 0.111 | 0.018 | . | 8.37 | . | 0.214 |
| 1 | **IMS PBS-263** | 57.92 | . | . | 2.40 | . | 0.038 | . | 0.040 | . | 0.147 | 0.510 | . | . | 0.066 | 0.256 | 0.016 | . | 3.68 | . | 0.057 |
| 1 | ~~IMS PBS-19G~~ | ~~60.00~~ | . | . | ~~2.32~~ | . | ~~0.042~~ | . | ~~(0.022)~~ | . | ~~(0.056)~~ | ~~0.332~~ | . | . | ~~(0.045)~~ | ~~0.067~~ | ~~0.033~~ | . | ~~4.18~~ | . | ~~0.173~~ |
| 1 | GIOP-78 | 57.83 | . | . | 2.484 | . | 0.2818 | . | (0.0083) | . | 0.165 | 0.0792 | . | 0.0167 | . | 0.0401 | 0.0146 | . | 5.017 | . | 0.1272 |
| 1 | NCS DC14043 | 57.78 | 1.48 | . | 1.52 | . | 0.56 | . | 0.22 | . | 0.54 | 0.104 | . | . | 0.023 | 0.046 | 0.187 | . | 11.18 | 0.070 | . |
| 1 | GIOP-73 | 57.77 | . | . | 3.548 | . | 0.1806 | . | 0.018 | . | 0.078 | 0.0967 | . | 0.0183 | . | 0.0538 | 0.0326 | . | 5.251 | . | 0.1846 |
| 2 | IMZ 312 | 57.69 | (0.72) | . | 1.00 | . | 0.057 | . | 0.032 | . | 0.21 | 0.025 | . | . | 0.27 | 0.027 | 0.011 | . | 14.67 | . | 0.039 |
| 1 | GIOP-146 | 57.65 | . | . | 3.716 | . | 0.0486 | . | 0.0179 | . | 0.102 | 0.1401 | . | 0.015 | . | 0.0457 | 0.02603 | . | 5.777 | . | 0.2016 |


| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|


| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIOP-161 | (0.0016) | 0.0086 | . | 0.0092 | 0.00259 | 0.0319 | . | (0.0024) | 0.0037 | (0.0049) | 0.0382 | . | 0.00369 | 0.00283 | 6.017 | 10 g | Sr: 0.0108 |
| GIOP-89 | . | . | . | 0.0093 | . | . | . | . | . | . | . | . | 0.0045 | . | 7.118 | 10 g | |
| NCS DC28002a | 0.0012 | . | . | . | . | 0.068 | . | 0.0080 | . | . | . | . | 0.016 | . | . | 50 g | |
| IMZ 342 | . | . | . | . | . | (0.008) | . | . | . | (0.03) | (0.003) | . | 0.89 | . | (0.46) | 100 g | |
| GIOP-122 | 0.00497 | (0.0071) | . | 0.0078 | (0.0018) | (0.0025) | . | 0.0335 | (0.0028) | (0.002) | (0.0012) | . | 0.0034 | (0.0027) | 6.543 | 10 g | Sr: 0.0105 |
| GIOP-145 | (0.0016) | 0.006 | . | 0.0083 | 0.00183 | (0.0013) | . | (0.0018) | (0.0018) | (0.0051) | 0.00203 | . | 0.00384 | (0.0026) | 7.658 | 10 g | Sr: 0.0204 |
| GIOP-87 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 8.034 | 10 g | |
| ECRM 680-1 | 0.057 | . | . | . | 0.013 | 0.005 | . | 0.063 | 0.007 | 0.317 | . | . | 0.165 | . | . | 100 g | |
| GIOP-45 | . | . | . | 0.0149 | . | 0.0023 | . | 0.0025 | . | . | . | . | . | . | 6.615 | 10 g | |
| GIOP-67 | . | . | . | 0.0087 | . | 0.0037 | . | . | . | . | . | . | 0.0052 | . | 6.774 | 10 g | |
| IMZ 262/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC28036 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| GIOP-85 | . | . | . | 0.0059 | 0.0053 | . | . | . | . | . | 0.00604 | . | . | . | 8.808 | 10 g | |
| IRSID 606-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| GIOP-70 | . | . | . | 0.0081 | . | . | . | . | . | . | . | . | . | . | 8.069 | 10 g | |
| SRM 692 | (0.0045) | . | . | . | (0.0010) | (0.0019) | . | (0.0045) | (0.0007) | . | (0.0049) | . | . | . | . | 100 g | |
| NCS DC19003b | . | . | . | . | 0.015 | . | 0.042 | . | 0.014 | . | . | 0.78 | 0.028 | . | . | 70 g | |
| GIOP-69 | . | . | . | 0.0251 | . | . | . | . | . | . | . | . | . | . | 8.933 | 10 g | |
| GIOP-66 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 8.691 | 10 g | |
| GIOP-71 | . | . | . | 0.0187 | . | . | . | . | . | . | . | . | . | . | 8.855 | 10 g | |
| KZ 184-89 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | CO2: 4.14 |
| GIOP-144 | (0.0015) | (0.0048) | . | 0.0072 | (0.0019) | (0.0012) | . | 0.0025 | (0.0021) | (0.0044) | (0.0013) | . | 0.00346 | 0.0017 | 8.272 | 10 g | Sr: 0.0043 |
| GIOP-76 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 8.236 | 10 g | |
| GIOP-147 | (0.0022) | (0.0049) | . | 0.0056 | 0.00179 | (0.0018) | . | (0.0021) | (0.0019) | (0.0048) | 0.00277 | . | 0.00419 | 0.004 | 8.078 | 10 g | Sr:(0.0028) |
| GIOP-74 | . | . | . | 0.0093 | . | 0.0042 | . | . | . | . | . | . | . | . | 7.434 | 10 g | |
| GIOP-84 | . | 0.0111 | . | 0.008 | . | . | . | . | . | . | . | . | . | . | 6.597 | 10 g | |
| IMZ 355 | . | . | 0.079 | (0.0043) | . | 0.0062 | . | (0.0012) | . | 0.0013 | 0.0013 | . | 0.0020 | . | 3.20 | 100 g | |
| GIOP-88 | . | . | . | 0.0082 | . | . | . | . | . | . | . | . | 0.0063 | 0.005 | 7.877 | 10 g | |
| GIOP-148 | (0.0016) | (0.0041) | . | 0.0073 | (0.001) | 0.00185 | . | (0.0021) | (0.0021) | (0.0042) | 0.00193 | . | 0.0027 | 0.0031 | 8.2 | 10 g | Sr: 0.0051 |
| GIOP-138 | 0.0019 | (0.0032) | . | 0.0098 | (0.0017) | 0.0029 | . | (0.0023) | 0.00174 | (0.0031) | 0.00304 | . | (0.002) | 0.0035 | 7.363 | 10 g | Sr: 0.00226 |
| NCS DC14010b | . | . | . | . | . | . | . | 0.048 | . | . | . | . | 0.149 | . | . | 50 g | |
| NCS DC13034 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| IMZ 311 | 0.0006 | 0.004 | 0.015 | 0.25 | (0.0006) | 0.004 | . | 0.0012 | 0.003 | 0.0014 | 0.0014 | . | 0.0017 | . | -0.98 | 100 g | |
| GIOP-17 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 6.2 | 10 g | last |
| ASCRM 033 | 0.0019 | 0.0011 | . | 0.0045 | 0.0005 | 0.0012 | . | 0.0008 | 0.0011 | 0.0001 | 0.0031 | . | 0.0008 | 0.0022 | 9.52 | 10x10 g | Sr: 0.0004 |
| NCS DC28040 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| GIOP-125 | (0.0027) | (0.0036) | . | (0.0021) | (0.0031) | 0.0061 | . | (0.0028) | 0.0032 | (0.002) | 0.00212 | . | 0.0039 | (0.0042) | 7.644 | 10 g | Sr: 0.0105 |
| GIOP-81 | . | . | . | . | . | . | . | . | . | . | 0.00316 | . | 0.0065 | . | 8.618 | 10 g | |
| GIOP-79 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 8.55 | 10 g | |
| OREAS 405 | (0.001) | (0.003) | . | (0.005) | (0.000750) | . | 102* | (0.002) | (0.004) | (0.0015) | (0.00289) | . | (0.0017) | (0.007) | 5.61 | 10 g | Sr:(21.5*) |
| **IMS PBS-263** | 0.029 | (0.005) | . | 0.057 | 0.006 | 0.010 | . | 0.018 | 0.017 | (0.002) | 0.002 | **17034** | 0.007 | (0.008) | 9.15 | 250 g | Sr: 0.007 |
| ~~IMS PBS-19G~~ | ~~(0.003)~~ | ~~(0.004)~~ | . | ~~(0.036)~~ | ~~(0.002)~~ | ~~(0.002)~~ | . | ~~(0.003)~~ | ~~(0.003)~~ | ~~(0.002)~~ | ~~(0.003)~~ | . | ~~(0.015)~~ | ~~(0.004)~~ | ~~6.34~~ | ~~2 kg~~ | ~~COARSE MATERIAL~~ |
| GIOP-78 | . | . | . | 0.0073 | . | . | . | . | . | . | 0.00281 | . | 0.0076 | . | 8.967 | 10 g | |
| NCS DC14043 | . | . | . | . | . | . | . | 0.066 | . | . | . | . | . | . | . | 50 g | |
| GIOP-73 | . | . | . | 0.0105 | . | 0.0049 | . | . | . | . | . | . | . | . | 7.766 | 10 g | |
| IMZ 312 | (0.0007) | 0.0022 | 0.024 | 0.31 | 0.0003 | 0.006 | . | 0.0014 | 0.0022 | 0.0011 | 0.0019 | . | 0.0022 | . | -1.20 | 100 g | |
| GIOP-146 | (0.0016) | (0.0036) | . | 0.0105 | 0.0017 | 0.00388 | . | (0.0023) | (0.0013) | (0.0044) | 0.0039 | . | 0.00308 | 0.00397 | 7.347 | 10 g | Sr: 0.0034 |


| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**CRM** **IRON ORE, chart 6 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | VS R36 | 57.47 | 0.73 | . | 0.71 | . | 0.037 | . | 0.015 | . | 0.39 | . | 0.024 | . | 0.076 | 0.0138 | 0.0064 | . | 16.28 | . | 0.031 |
| 1 | NCS DC28081 | 57.41 | 1.89 | . | 5.11 | . | 0.34 | . | 0.150 | . | 0.142 | . | 0.228 | . | 0.045 | 0.054 | 0.018 | . | 7.31 | . | 0.230 |
| 1 | GIOP-86 | 57.26 | . | . | 2.657 | . | 0.1514 | . | 0.0107 | . | 0.1758 | 0.085 | . | 0.0184 | . | 0.03934 | 0.0139 | . | 5.752 | . | 0.1434 |
| 1 | GIOP-75 | 57.23 | . | . | 2.649 | . | 0.1564 | . | 0.01048 | . | 0.1778 | 0.0875 | . | 0.0182 | . | 0.0394 | 0.014 | . | 5.761 | . | 0.143 |
| 1 | GIOP-68 | 57.18 | . | . | 4.126 | . | 0.0414 | . | 0.0173 | . | 0.063 | 0.1027 | . | 0.0163 | . | 0.0555 | 0.0293 | . | 5.51 | . | 0.2228 |
| 1 | GIOP-61 | 57.14 | . | . | 2.523 | . | 0.1735 | . | 0.0194 | . | 0.068 | 0.228 | . | 0.0199 | . | 0.0426 | 0.0388 | . | 5.946 | . | 0.115 |
| 1 | JSS 821-1 | 57.05 | . | 1.24 | . | 0.159 | . | 0.0055 | . | 0.113 | . | 0.085 | . | 0.0095 | . | 0.0415 | 0.0108 | 2.28 | . | 0.0718 | . |
| 1 | ECRM 689-1 | 57.05 | . | 1.185 | . | 1.183 | . | 0.462 | . | 0.980 | . | 0.1196 | . | 0.638 | . | 0.0706 | . | (5.4) | . | 0.3264 | . |
| 1 | ASCRM 030 | 56.76 | . | 1.42 | . | 0.245 | . | 0.009 | . | 0.108 | . | 0.079 | . | 0.0170 | . | 0.038 | 0.021 | 2.71 | . | 0.089 | . |
| 1 | JSS 831-2 | 56.64 | 1.97 | FeII: | 21.82 | 1.05 | . | 0.061 | . | 2.09 | . | 0.501 | . | 0.082 | | 0.153 | 0.0049 | 1.93 | . | 4.51 | . |
| 1 | NCS DC73005 | 56.60 | 20.50 | . | 0.99 | . | 1.36 | . | 0.071 | . | 3.62 | 0.076 | . | . | 0.058 | 0.017 | 2.44 | . | 11.48 | 0.043 | . |
| 1 | GIOP-142 | 56.58 | . | . | 3.032 | . | 0.2678 | . | 0.0109 | . | 0.218 | 0.0892 | . | 0.0126 | . | 0.0412 | 0.01404 | . | 6.704 | . | 0.1782 |
| 1 | NCS DC28212 | 56.29 | 26.9 | . | 2.53 | . | 8.04 | . | . | . | 1.96 | . | 0.289 | . | . | 0.032 | 0.197 | . | 8.86 | . | 0.208 |
| 1 | GIOP-137 | 56.285 | . | . | 6.029 | . | 0.966 | . | 0.0691 | . | 0.5292 | 0.04 | . | 0.2205 | . | 0.0579 | 0.0209 | . | 7.946 | . | 0.3815 |
| 1 | NCS DC28112 | 56.23 | 24.15 | . | 1.39 | . | 2.73 | . | 0.133 | . | 4.89 | 0.132 | . | . | 0.070 | 0.023 | 0.369 | . | 7.81 | 0.620 | 1.03 |
| 1 | JSS 820-5 | 56.17 | . | 1.63 | . | 0.112 | . | 0.0172 | . | 0.073 | . | 0.067 | . | 0.0132 | . | 0.031 | 0.0182 | 2.81 | . | 0.092 | . |
| 1 | IMS PBS-73 | 56.06 | . | . | 3.19 | . | 0.129 | . | 0.027 | . | (0.090) | 0.138 | . | . | 0.096 | 0.076 | 0.038 | . | 6.77 | . | 0.111 |
| 1 | NCS DC11018 | 56.02 | 7.78 | . | 2.20 | . | 9.89 | . | 0.038 | . | 2.87 | . | 0.355 | . | 0.057 | 0.058 | 0.023 | . | 4.50 | . | 0.108 |
| 2 | IMZ 313 | 55.85 | 0.68 | . | 1.13 | . | 0.079 | . | 0.030 | . | 0.31 | 0.03 | . | . | 0.23 | 0.031 | 0.0085 | . | 17.29 | . | 0.044 |
| 1 | NCS DC15002a | 55.81 | 1.86 | . | 1.93 | . | 1.10 | . | 0.433 | . | 0.36 | . | 0.026 | . | 0.33 | 0.011 | 0.469 | . | 13.00 | . | 0.083 |
| 1 | VS R5/6 | 55.8 | 9.81 | . | 2.57 | . | 9.30 | . | . | . | 1.95 | . | 0.86 | . | . | 0.029 | 0.035 | . | 5.71 | . | 0.29 |
| 1 | **IMS PBS-202** | 55.48 | . | . | 2.60 | . | 1.43 | . | 0.191 | . | 1.05 | 0.576 | . | . | 0.034 | 0.202 | 0.095 | . | 4.29 | . | 0.192 |
| 1 | IMS PBS-31 | 55.24 | . | . | 6.03 | . | 0.062 | . | 0.020 | . | (0.096) | 0.231 | . | . | (0.072) | 0.038 | 0.066 | . | 4.26 | . | 0.185 |
| 1 | NCS DC19016 | 55.23 | 1.01 | . | 3.07 | . | 1.08 | . | 0.123 | . | 1.88 | . | 0.199 | . | 0.173 | 0.037 | 0.0087 | . | 6.43 | . | 7.69 |
| 1 | GIOP-136 | 55.22 | . | . | 6.493 | . | 1.055 | . | 0.0757 | . | 0.5767 | 0.0402 | . | 0.241 | . | 0.0578 | 0.0241 | . | 8.632 | . | 0.4166 |
| 1 | OREAS 404 | 55.14 | . | . | 2.97 | . | 0.102 | . | (0.008) | . | (0.074) | . | (0.007) | . | (0.014) | 0.151 | 0.032 | . | 7.88 | . | 0.385 |
| 2 | IMZ 343 | 55.09 | 6.37 | . | 0.74 | . | 10.93 | . | 0.037 | . | 1.21 | 0.0200 | . | . | (0.040) | 0.030 | 0.021 | . | 9.31 | . | 0.032 |
| 1 | NCS DC28225 | 54.96 | 10.7 | . | 2.93 | . | 11.49 | . | . | . | 0.98 | . | 0.171 | . | . | 0.050 | 0.032 | . | 5.89 | . | 0.152 |
| 1 | NCS DC18018 | 54.90 | 7.87 | . | 2.34 | . | 10.36 | . | . | . | 2.41 | . | 0.29 | . | . | 0.064 | 0.036 | . | 5.81 | . | 0.50 |
| 1 | NCS DC11004a | 54.86 | 1.17 | . | 2.85 | . | 0.630 | . | 0.26 | . | 0.524 | . | 1.04 | . | 0.047 | 0.119 | 0.258 | . | 8.27 | . | 0.120 |
| 1 | VS 5405-90 | 54.83 | . | . | 2.04 | . | . | . | 0.33 | . | 0.29 | 0.62 | . | . | . | 0.034 | 0.018 | . | 16.23 | . | 0.092 |
| 1 | NCS DC11006a | 54.74 | 3.90 | . | 1.48 | . | 1.02 | . | 0.214 | . | 0.657 | . | 1.31 | . | 0.048 | 0.036 | 0.439 | . | 8.53 | . | 0.154 |
| 1 | NCS DC18019 | 54.03 | 7.98 | . | 2.57 | . | 10.50 | . | . | . | 2.71 | . | 0.70 | . | . | 0.073 | 0.027 | . | 6.11 | . | 0.24 |
| 1 | NM 161.5 | 53.85 | . | . | 7.53 | . | . | . | . | . | . | . | . | . | . | 0.071 | 0.008 | . | 7.13 | . | 0.29 |
| 1 | IMS PBS-28 | 53.74 | . | . | 4.34 | . | 0.058 | . | 0.073 | . | (0.094) | 0.851 | . | . | (0.098) | 0.074 | 0.029 | . | 7.12 | . | 0.190 |
| 1 | IRSID 603-1 | 53.65 | . | 4.20 | . | (0.91) | . | . | . | (0.2) | . | 0.440 | . | . | . | 0.084 | 0.097 | 1.28 | . | 0.137 | . |
| 1 | NCS DC28034 | 53.42 | 15.27 | . | 0.57 | . | 0.31 | . | 0.086 | . | 11.21 | 0.065 | . | . | 0.25 | 0.018 | 0.192 | . | 5.22 | 0.044 | . |

# Number Fe FeO Al $Al_2O_3$ Ca CaO K $K_2O$ Mg MgO Mn MnO Na $Na_2O$ P S Si $SiO_2$ Ti $TiO_2$

| Number | As | Ba | C | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS R36 | . | . | . | . | . | . | . | . | . | . | . | . | Insoluble Residue: | | 16.5 | 100 g | |
| NCS DC28081 | 0.0014 | . | . | . | . | 0.032 | . | 0.0038 | . | . | . | . | 0.0027 | . | . | 50 g | |
| GIOP-86 | . | . | . | . | . | . | . | . | . | . | 0.00336 | . | 0.0094 | . | 8.94 | 10 g | |
| GIOP-75 | . | . | . | . | . | . | . | . | . | . | 0.00312 | . | 0.0092 | . | 8.954 | 10 g | |
| GIOP-68 | . | . | . | 0.011 | . | 0.0051 | . | . | . | . | 0.00353 | . | . | . | 7.876 | 10 g | |
| GIOP-61 | . | . | . | 0.0094 | . | . | . | . | . | . | . | . | 0.0042 | . | 8.961 | 10 g | |
| JSS 821-1 | . | . | . | . | . | 0.0027 | . | 0.0007 | 0.0035 | 0.0006 | 0.0040 | . | 0.0074 | . | 9.16 | 70 g | |
| ECRM 689-1 | . | . | . | . | 0.0103 | . | . | 0.0068 | 0.0195 | . | 0.1020 | . | 0.0042 | . | . | 100 g | |
| ASCRM 030 | 0.0014 | 0.0034 | . | 0.0101 | 0.0014 | 0.0020 | . | 0.0016 | 0.0019 | 0.0008 | 0.0042 | . | 0.0096 | 0.0037 | 9.24 | 10x10 g | Sr: 0.0010 |
| JSS 831-2 | . | . | . | . | . | 0.028 | . | 0.0068 | 0.0077 | . | 0.299 | . | 0.074 | . | (0.11) | 100 g | |
| NCS DC73005 | . | . | . | . | . | . | . | 0.068 | . | . | . | . | . | . | . | 50 g | |
| GIOP-142 | (0.0015) | (0.0052) | . | (0.0035) | 0.00182 | 0.00206 | . | (0.0019) | 0.002 | (0.0038) | 0.00499 | . | 0.00871 | 0.0054 | 8.368 | 10 g | Sr:0.004 |
| NCS DC28212 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| GIOP-137 | (0.001) | 0.0053 | . | (0.0032) | (0.0017) | 0.0051 | . | (0.0019) | 0.00175 | (0.0026) | 0.00726 | . | 0.00233 | 0.0079 | 3.111 | 10 g | Sr: 0.0056 |
| NCS DC28112 | 0.167 | . | . | . | . | . | . | 0.527 | . | . | . | . | 0.037 | . | . | 70 g | |
| JSS 820-5 | . | . | . | . | . | 0.0032 | . | 0.00068 | 0.0023 | 0.00065 | 0.0042 | . | 0.0032 | . | 8.78 | 70 g | |
| IMS PBS-73 | (0.022) | 0.039 | . | (0.082) | 0.042 | 0.043 | . | 0.049 | 0.046 | 0.056 | 0.034 | Sr:0.070 | 0.057 | (0.045) | 8.36 | 250 g | Sn: 0.045 |
| NCS DC11018 | 0.0014 | . | . | . | . | . | . | 0.0044 | . | 0.0031 | . | . | 0.065 | . | . | 70 g | |
| IMZ 313 | (0.0008) | 0.0017 | 0.031 | (0.29) | 0.0002 | 0.0067 | . | 0.0015 | 0.0024 | 0.0009 | (0.001) | . | 0.0028 | . | -1.31 | 100 g | |
| NCS DC15002a | 0.23 | . | . | . | . | . | . | 0.134 | . | 0.319 | . | . | 0.161 | . | . | 50 g | |
| VS R5/6 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 150 g | |
| **IMS PBS-202** | 0.013 | (0.006) | . | (0.018) | (0.004) | 0.007 | . | 0.002 | 0.010 | 0.004 | 0.007 | . | 0.014 | (0.005) | 9.46 | 250 g | **17034** |
| IMS PBS-31 | 0.081 | (0.002) | . | (0.055) | (0.003) | . | 0.009 | (0.002) | (0.005) | (0.003) | (0.006) | . | 0.019 | (0.007) | 9.56 | 250 g | |
| NCS DC19016 | . | . | . | . | 0.010 | . | 0.34 | . | 0.021 | . | . | 0.51 | 0.033 | . | . | 100 g | |
| GIOP-136 | (0.001) | 0.0056 | . | 0.0036 | (0.0018) | 0.00537 | . | (0.0016) | 0.00194 | (0.003) | 0.00768 | . | 0.00257 | 0.0087 | 3.266 | 10 g | Sr: 0.0053 |
| OREAS 404 | (0.00176) | (0.00312) | . | (0.00379) | . | . | 0.0124 | (0.0018) | (0.0031) | (0.0006) | (0.00422) | . | (0.0018) | (0.0107) | 9.40 | 10 g | Sr:(23.6*) |
| IMZ 343 | . | . | . | . | . | 0.004 | . | . | . | . | . | . | 0.005 | . | . | 100 g | |
| NCS DC28225 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC18018 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC11004a | 0.096 | (BaO:0.86) | 0.310 | . | 0.0054 | . | . | 0.066 | . | 0.101 | . | . | 0.144 | . | . | 50 g | |
| VS 5405-90 | . | . | . | . | . | . | . | . | . | 0.23 | . | . | 0.089 | . | . | 50 g | Ge: 5.1* |
| NCS DC11006a | 0.215 | (BaO:1.08) | 0.227 | . | 0.0086 | . | . | 0.102 | . | 0.182 | . | . | 0.30 | . | . | 50 g | |
| NCS DC18019 | 0.021 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NM 161.5 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| IMS PBS-28 | (0.003) | (0.010) | . | 0.080 | (0.002) | . | (0.007) | (0.002) | (0.005) | (0.003) | (0.003) | . | (0.008) | (0.003) | 9.75 | 250 g | |
| IRSID 603-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC28034 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | $B_2O_3$: 3.62 |

Number As Ba C Cl Co Cr $Cr_2O_3$ Cu Ni Pb V $V_2O_5$ Zn Zr LOI Units Other

**CRM** **IRON ORE, chart 7 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SARM 147 | 52.67 | . | . | 0.96 | . | 7.05 | . | (0.21) | . | 5.28 | . | 0.23 | . | . | . | 0.13 | . | 3.35 | . | 1.72 |
| 1 | OREAS 403 | 52.31 | . | . | 2.63 | . | 0.106 | . | 0.011 | . | 0.077 | . | (0.007) | . | (0.015) | 0.123 | 0.026 | . | 13.67 | . | 0.289 |
| 1 | NCS DC11007a | 52.24 | 4.21 | . | 6.84 | . | 0.561 | . | 0.61 | . | 0.606 | . | 0.194 | . | 0.093 | 0.346 | 0.094 | . | 10.20 | . | 0.237 |
| 2 | IMZ 263/1 | 52.10 | . | . | 1.14 | . | 0.17 | . | . | . | 0.17 | (0.04) | 0.045 | . | . | (0.026) | 0.036 | . | 22.78 | . | . |
| 1 | **IMS PBS-222** | 52.08 | . | . | 9.60 | . | 0.073 | . | 0.024 | . | 0.080 | 0.126 | . | . | 0.027 | 0.039 | 0.034 | . | 9.33 | . | 0.760 |
| 1 | NCS DC11029 | 51.67 | 27.30 | . | 4.97 | . | 0.52 | . | 0.0081 | . | 2.02 | . | 0.238 | . | 0.023 | 0.046 | 0.259 | . | 4.06 | . | 13.54 |
| 1 | ECRM 677-1 | 51.54 | . | 0.32 | . | 0.038 | . | 0.008 | . | 0.012 | . | 0.016 | . | 0.007 | . | 0.0170 | (0.005) | 11.78 | . | 0.013 | . |
| 1 | ~~NCS DC28064~~ | ~~51.48~~ | ~~0.25~~ | ~~.~~ | ~~5.65~~ | ~~.~~ | ~~0.014~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.70~~ | ~~0.70~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0045~~ | ~~0.17~~ | ~~.~~ | ~~2.30~~ | ~~.~~ | ~~0.15~~ |
| 1 | NCS DC28067 | 51.36 | 0.26 | . | 4.16 | . | 0.022 | . | . | . | 1.05 | 0.80 | . | . | . | 0.0055 | 0.095 | . | 3.11 | . | 0.091 |
| 1 | IMS PBS-29 | 51.21 | . | . | 3.69 | . | 0.085 | . | 0.090 | . | (0.093) | 1.284 | . | . | (0.052) | 0.054 | 0.030 | . | 12.56 | . | 0.245 |
| 1 | NCS DC28083 | 50.98 | 8.92 | . | 5.03 | . | 3.44 | . | . | . | 1.05 | . | 0.306 | . | . | 0.963 | 0.112 | . | 9.40 | . | 0.125 |
| 1 | NCS DC28111 | 50.94 | 20.67 | . | 1.42 | . | 4.85 | . | 0.204 | . | 3.95 | 0.098 | . | . | 0.14 | 0.033 | 0.430 | . | 13.83 | 0.065 | 0.108 |
| 1 | NCS DC28213 | 50.92 | 19.9 | . | 3.28 | . | 6.90 | . | . | . | 3.40 | . | 0.943 | . | . | 0.050 | 0.130 | . | 13.68 | . | 0.241 |
| 1 | CGL 206 | 50.87 | Sr:0.002238 | | 1.25 | . | 5.87 | . | 0.24 | . | 4.93 | . | 0.11 | . | (0.10) | . | (2.60) | . | 5.86 | . | 0.08 |
| 1 | GIOP-15 | 50.68 | . | . | 4.1 | . | . | . | . | . | . | . | . | . | . | 0.032 | . | . | 20.10 | . | 0.04 |
| 1 | VS R33 | 50.42 | . | . | . | . | 8.35 | . | . | . | 1.33 | . | . | . | . | 0.039 | 3.10 | . | 10.62 | . | . |
| 1 | NCS DC28082 | 49.53 | 0.05 | . | 7.45 | . | 0.032 | . | . | . | 0.107 | . | 3.39 | . | . | 0.083 | 0.029 | . | 7.44 | . | 0.370 |
| 1 | NCS DC73004 | 49.50 | 7.66 | . | 2.58 | . | 0.91 | . | 0.91 | . | 0.98 | 0.198 | . | . | 0.035 | 0.138 | 0.065 | . | 16.30 | 0.083 | . |
| 1 | GIOP-36 | 49.5 | . | . | 5.51 | . | 0.011 | . | . | . | 2.657 | 0.200 | . | . | . | 0.008 | 0.014 | . | 0.85 | . | 20.10 |
| 1 | GIOP-35 | 49.4 | . | . | 5.53 | . | . | . | . | . | 2.569 | 0.200 | . | . | . | 0.008 | 0.014 | . | 0.85 | . | 20.20 |
| 1 | NCS DC11030 | 49.12 | 26.44 | . | 5.09 | . | 1.16 | . | 0.023 | . | 2.30 | . | 0.240 | . | 0.073 | 0.179 | 0.382 | . | 5.52 | . | 12.80 |
| 1 | NCS DC18017 | 48.44 | 11.17 | . | 2.98 | . | 15.52 | . | . | . | 2.32 | . | 0.81 | . | . | 0.065 | 0.155 | . | 8.40 | . | 0.23 |
| 1 | OREAS 402 | 48.41 | . | . | 2.49 | . | 0.090 | . | 0.010 | . | 0.072 | . | (0.007) | . | (0.016) | 0.119 | 0.024 | . | 19.77 | . | 0.288 |
| 1 | NCS DC28082a | 48.00 | 0.05 | . | 3.44 | . | 0.15 | . | . | . | 0.268 | . | 3.40 | . | . | 0.076 | 0.111 | . | 12.74 | . | 0.146 |
| 1 | ~~NCS DC15004~~ | ~~47.86~~ | ~~21.99~~ | ~~.~~ | ~~1.12~~ | ~~.~~ | ~~1.72~~ | ~~.~~ | ~~0.062~~ | ~~.~~ | ~~0.96~~ | ~~.~~ | ~~0.082~~ | ~~.~~ | ~~0.043~~ | ~~0.032~~ | ~~0.235~~ | ~~.~~ | ~~28.01~~ | ~~.~~ | ~~0.070~~ |
| 1 | NCS DC26706 | 47.72 | . | . | 4.65 | . | 0.13 | . | . | . | 2.34 | 0.89 | . | . | . | 0.0027 | 0.12 | . | 5.16 | . | . |
| 1 | ~~GIOP-134~~ | ~~47.52~~ | ~~.~~ | ~~.~~ | ~~9.953~~ | ~~.~~ | ~~1.688~~ | ~~.~~ | ~~0.1171~~ | ~~.~~ | ~~0.934~~ | ~~0.05982~~ | ~~.~~ | ~~0.3921~~ | ~~.~~ | ~~0.0577~~ | ~~0.0258~~ | ~~.~~ | ~~13.474~~ | ~~.~~ | ~~0.6576~~ |
| 2 | IMZ 341 | 47.52 | . | . | 1.22 | . | 0.52 | . | 0.11 | . | 0.35 | 0.021 | . | . | (0.09) | 0.164 | 0.006 | . | 28.49 | . | 0.041 |
| 1 | NCS DC28108 | 46.93 | 19.95 | . | 2.05 | . | 7.12 | . | 0.33 | . | 5.54 | 0.058 | . | . | 0.220 | 0.039 | 0.637 | . | 14.75 | 0.067 | 0.112 |
| 1 | NCS DC11031 | 46.74 | 24.39 | . | 5.49 | . | 1.18 | . | 0.021 | . | 2.60 | . | 0.226 | . | 0.057 | 0.101 | 0.21 | . | 8.19 | . | 12.24 |
| 1 | OREAS 401 | 45.63 | . | . | 2.36 | . | 0.094 | . | 0.010 | . | 0.061 | . | (0.007) | . | (0.016) | 0.105 | 0.022 | . | 24.88 | . | 0.247 |
| 1 | GIOP-133 | 45.481 | . | . | 10.86 | . | 1.863 | . | 0.1277 | . | 1.029 | 0.06048 | . | 0.4342 | . | 0.0573 | 0.0277 | . | 14.796 | . | 0.7211 |
| 1 | NCS DC62001d | 44.99=$Fe_2O_3$ | | . | 4.37 | . | 9.92 | . | 0.89 | . | 1.55 | . | . | . | 0.37 | . | SO3:3.15 | . | 26.64 | . | 0.27 |
| 1 | NCS DC11001 | 44.73 | 12.91 | . | 0.75 | . | 7.14 | . | . | . | 4.18 | . | 0.20 | . | . | 0.013 | 1.50 | . | 18.22 | . | . |
| 1 | NM 161.4 | 44.58 | . | . | 12.40 | . | 0.41 | . | . | . | 0.24 | . | . | . | . | 0.092 | 0.008 | . | 12.23 | . | 0.50 |
| 1 | IMS PBS-11 | 44.56 | . | . | 6.12 | . | 0.146 | . | 0.122 | . | (0.118) | 0.814 | . | . | (0.028) | 0.047 | 0.033 | . | 21.51 | . | 0.528 |
| 1 | AMIS 0346 | 44.34 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 15.02 | . |
| 2 | IMZ 264/1 | 44.25 | . | . | 1.14 | . | 0.23 | . | . | . | 0.22 | (0.04) | 0.043 | . | . | 0.025 | 0.055 | . | 33.56 | . | . |
| 1 | GIOP-132 | 43.12 | . | . | 11.89 | . | 2.062 | . | 0.1405 | . | 1.141 | 0.0608 | . | 0.4797 | . | 0.0567 | 0.0302 | . | 16.33 | . | 0.7943 |
| 1 | NCS DC19013 | 42.89 | . | . | 4.10 | . | 0.124 | . | . | . | 0.517 | . | 1.67 | . | . | 0.099 | . | . | 22.06 | . | 0.26 |

| Number | As | Ba | $CO_2$ | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | NiO | Pb | V | $V_2O_5$ | Zn | ZnO | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 147 | . | . | C:1.36 | . | . | . | . | CuO:(0.13) | . | (0.04) | . | . | 0.104 | . | . | . | 3.37 | 100 g | $P_2O_5$: 1.17 |
| OREAS 403 | (0.00137) | . | . | (0.00366) | . | . | 0.0109 | (0.0016) | (0.0020) | . | (0.0018) | 0.00345 | . | (0.0020) | . | (0.0085) | 8.00 | 10 g | |
| NCS DC11007a | 0.051 | . | C:0.549 | . | 0.0043 | . | . | 0.015 | . | . | 0.034 | . | . | 0.066 | . | . | . | 50 g | BaO: (0.028) |
| IMZ 263/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| **IMS PBS-222** | 0.005 | (0.002) | . | (0.007) | (0.001) | . | (0.007) | 0.002 | (0.002) | . | (0.003) | 0.007 | 0.002 | . | **17034** | (0.018) | 5.22 | 250 g | Sr: 0.008 |
| NCS DC11029 | . | . | . | . | . | . | . | . | . | . | . | . | 0.590 | 0.045 | . | . | . | 70 g | |
| ECRM 677-1 | . | . | . | . | . | . | . | . | (0.0015) | . | . | . | . | . | . | . | . | 100 g | |
| ~~NCS DC28064~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.10~~ | ~~1.80~~ | ~~.~~ | ~~.~~ | ~~0.72~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~50 g~~ | |
| NCS DC28067 | . | . | . | . | 0.098 | 2.00 | . | . | 0.94 | . | . | . | . | . | . | . | . | 50 g | |
| IMS PBS-29 | (0.004) | (0.012) | . | (0.027) | (0.002) | . | (0.009) | (0.002) | (0.005) | . | (0.003) | (0.006) | (0.008) | . | . | (0.007) | 7.86 | 250 g | |
| NCS DC28083 | . | . | C:0.89 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC28111 | 0.083 | . | . | . | . | . | . | 0.305 | . | . | . | . | . | 0.017 | . | . | . | 70 g | |
| NCS DC28213 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| CGL 206 | (0.00270) | (0.00251) | . | . | 0.00905 | (0.00202) | . | 0.04181 | 0.01143 | . | 0.004446 | 0.02655 | . | 0.07032 | . | . | (4.59) | 100 g | $P_2O_5$: 0.048 |
| GIOP-15 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1.3 | 10 g | |
| VS R33 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC28082 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | C: 0.071 |
| NCS DC73004 | . | . | . | . | . | . | . | 0.0014 | . | . | . | . | . | . | . | . | . | 50 g | |
| GIOP-36 | . | . | . | 0.008 | 0.022 | 0.067 | . | . | 0.038 | . | . | 0.313 | . | 0.063 | . | . | -0.64 | 10 g | |
| GIOP-35 | . | . | . | 0.008 | 0.022 | 0.068 | . | . | 0.038 | . | . | 0.313 | . | 0.062 | . | . | -0.51 | 10 g | Sn: 0.003 |
| NCS DC11030 | . | . | . | . | . | . | . | . | . | . | . | . | 0.553 | 0.043 | . | . | . | 70 g | |
| NCS DC18017 | 0.030 | . | . | . | . | . | . | . | . | . | 0.061 | . | . | 0.13 | . | . | . | 100 g | |
| OREAS 402 | (0.00114) | . | . | (0.00343) | . | . | 0.0109 | (0.0018) | (0.00148) | . | (0.00090) | (0.00351) | . | (0.00193) | . | (0.0083) | 7.64 | 10 g | |
| NCS DC28082a | . | . | . | . | . | . | . | . | . | . | 0.283 | . | . | 0.49 | . | . | . | 50 g | C: 0.072 |
| ~~NCS DC15004~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0023~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| NCS DC26706 | . | . | . | . | 0.14 | 2.34 | . | . | 1.05 | . | . | . | . | . | . | . | . | 25 g | C: 0.25 |
| ~~GIOP-134~~ | ~~(0.001)~~ | ~~0.008~~ | ~~.~~ | ~~0.0036~~ | ~~(0.0015)~~ | ~~0.0077~~ | ~~.~~ | ~~(0.002)~~ | ~~0.00227~~ | ~~.~~ | ~~(0.0027)~~ | ~~0.0122~~ | ~~.~~ | ~~0.00251~~ | ~~.~~ | ~~0.0125~~ | ~~4.452~~ | ~~10 g~~ | ~~Sr: 0.007~~ |
| IMZ 341 | . | . | C:(0.037) | . | . | . | . | . | . | . | . | . | . | . | . | . | (1.1) | 100 g | |
| NCS DC28108 | . | . | . | . | . | . | . | 0.119 | . | . | . | . | . | 0.0038 | . | . | . | 70 g | |
| NCS DC11031 | . | . | . | . | . | . | . | . | . | . | . | . | 0.539 | 0.041 | . | . | . | 70 g | |
| OREAS 401 | (0.00109) | . | . | (0.00328) | . | . | 0.0107 | (0.0018) | (0.00289) | . | (0.00112) | (0.00322) | . | (0.00211) | . | (0.0074) | 6.71 | 10 g | |
| GIOP-133 | (0.001) | 0.0081 | . | 0.00357 | (0.0014) | 0.00784 | . | (0.0013) | 0.00233 | . | (0.0021) | 0.129 | . | 0.00297 | . | 0.136 | 4.762 | 10 g | Sr: 0.0075 |
| NCS DC62001d | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 7.51 | 20 g | |
| NCS DC11001 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 60 g | |
| NM 161.4 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| IMS PBS-11 | (0.003) | (0.013) | . | (0.009) | (0.001) | . | (0.021) | (0.003) | (0.004) | . | (0.004) | 0.011 | (0.006) | . | . | (0.014) | 6.28 | 250 g | |
| AMIS 0346 | . | . | . | . | . | . | . | . | . | . | . | 0.27 | . | . | . | Density: | 4.39 | 100 g or 1kg | |
| IMZ 264/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| GIOP-132 | (0.001) | 0.0083 | . | 0.00413 | (0.0016) | 0.0089 | . | 0.0021 | 0.00263 | . | (0.003) | 0.0155 | . | 0.00319 | . | 0.0156 | 5.101 | 10 g | Sr: 0.0086 |
| NCS DC19013 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |

**CRM** **IRON ORE, chart 8 of 9** # = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IRSID 612-1 | 42.4 | . | 3.00 | . | 12.06 | . | . | . | 1.20 | . | 0.363 | . | . | . | 0.885 | 0.053 | 5.94 | . | 0.151 | . |
| 1 | NCS DC18020 | 41.81 | 21.87 | . | 3.23 | . | 18.30 | . | . | . | 4.85 | . | 1.80 | . | . | 0.159 | 0.302 | . | 10.21 | . | 0.50 |
| 1 | IMS PBS-30 | 41.13 | . | . | 4.57 | . | 0.070 | . | 0.382 | . | (0.089) | 12.78 | . | . | (0.093) | 0.038 | 0.033 | . | 7.02 | . | 0.231 |
| 1 | GIOP-131 | 41.08 | . | . | 12.77 | . | 2.23 | . | 0.151 | . | 1.231 | 0.0612 | . | 0.5184 | . | 0.0561 | 0.0329 | . | 17.619 | . | 0.8557 |
| 1 | NCS DC73003 | 40.51 | (14.5) | . | 2.27 | . | 2.00 | . | 0.27 | . | 2.22 | 0.122 | . | . | 0.16 | 0.032 | 0.94 | . | 33.93 | 0.067 | . |
| 1 | NCS DC28065 | 39.68 | 0.10 | . | 9.98 | . | 0.30 | . | . | . | 2.54 | 0.59 | . | . | . | 0.010 | 0.23 | . | 10.00 | . | 0.14 |
| 1 | CGL 133 | 39.32 | . | . | 1.69 | . | 9.34 | . | 0.35 | . | 8.04 | . | 0.133 | . | (0.162) | . | (2.727) | . | 9.29 | . | 0.095 |
| 1 | KZ 182-89 | 38.63 | 1.61 | . | 1.04 | . | 0.14 | . | 0.11 | . | . | 0.044 | . | . | . | 0.065 | . | . | 42.64 | . | 0.144 |
| ~~1~~ | ~~VS R8/3~~ | ~~38.2~~ | ~~.~~ | ~~.~~ | ~~10.35~~ | ~~.~~ | ~~0.89~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~2.17~~ | ~~.~~ | ~~0.432~~ | ~~.~~ | ~~.~~ | ~~0.165~~ | ~~0.031~~ | ~~.~~ | ~~16.57~~ | ~~.~~ | ~~0.85~~ |
| 2 | IMZ 265/1 | 37.74 | . | . | 3.10 | . | 1.50 | . | . | . | 0.53 | 0.056 | . | . | . | 0.039 | 0.047 | . | 37.02 | . | . |
| 1 | IRSID 601-1 | 36.76 | . | 2.33 | . | 4.05 | . | . | . | 1.21 | . | 0.370 | . | . | . | 0.590 | 0.065 | 8.95 | . | 0.114 | . |
| 1 | NCS DC13033 | 35.36 | 5.18 | . | (0.11) | . | (0.13) | . | . | . | 0.20 | . | 0.125 | . | . | 0.022 | 0.0064 | . | 48.50 | . | 0.007 |
| 1 | KZ 183-89 | 35.16 | 1.32 | . | 1.66 | . | . | . | 0.35 | . | . | 0.046 | . | . | . | 0.019 | 0.7 | . | 41.56 | . | 0.073 |
| 1 | VS R20/3 | 34.7 | . | . | 0.67 | . | 2.54 | Magnetic Iron: 27.6% | | | 3.42 | . | . | . | . | . | 0.073 | . | 37.6 | . | . |
| 1 | NCS DC28069 | 34.18 | 0.11 | . | 2.39 | . | 0.12 | . | . | . | 12.12 | 0.78 | . | . | . | 0.0015 | 0.082 | . | 18.28 | . | 0.030 |
| 1 | NCS DC11013 | 34.07 | 20.15 | . | 0.74 | . | 0.99 | . | 0.165 | . | 2.86 | . | 0.093 | . | 0.065 | 0.054 | 0.118 | . | 48.27 | . | 0.043 |
| 1 | VS R24/2 | 33.73 | . | . | 1.52 | . | 2.12 | . | . | . | 8.29 | . | . | . | . | 0.0055 | 0.065 | . | 5.46 | . | . |
| 1 | VS R9/1 | 33.48 | 42.9 | . | 0.86 | . | 2.29 | . | . | . | 9.64 | . | . | . | . | 0.0051 | 0.059 | . | 3.47 | . | . |
| ~~1~~ | ~~GIOP-110~~ | ~~33.21~~ | ~~.~~ | ~~.~~ | ~~0.0893~~ | ~~.~~ | ~~1.417~~ | ~~.~~ | ~~0.0159~~ | ~~.~~ | ~~1.778~~ | ~~0.021~~ | ~~.~~ | ~~0.0152~~ | ~~.~~ | ~~0.0928~~ | ~~0.0042~~ | ~~.~~ | ~~50.09~~ | ~~.~~ | ~~0.0141~~ |
| 1 | **IMS-441** | 32.71 | . | . | 2.01 | . | 1.43 | . | 0.708 | . | 2.37 | 0.458 | . | . | 0.100 | 0.102 | 0.113 | . | 39.11 | . | 0.104 |
| ~~1~~ | ~~GIOP-98~~ | ~~32.63~~ | ~~.~~ | ~~.~~ | ~~0.1008~~ | ~~.~~ | ~~1.409~~ | ~~.~~ | ~~0.0121~~ | ~~.~~ | ~~1.875~~ | ~~0.0179~~ | ~~.~~ | ~~0.0163~~ | ~~.~~ | ~~0.1103~~ | ~~0.0273~~ | ~~.~~ | ~~50.88~~ | ~~.~~ | ~~0.138~~ |
| 1 | NCS HC19820 | 32.30 | . | . | 3.98 | . | 2.12 | . | . | . | 3.37 | . | 7.36 | . | . | 0.040 | 0.195 | . | 16.47 | . | 10.80 |
| ~~1~~ | ~~GIOP-107~~ | ~~32.23~~ | ~~.~~ | ~~.~~ | ~~0.246~~ | ~~.~~ | ~~3.523~~ | ~~.~~ | ~~0.0135~~ | ~~.~~ | ~~1.257~~ | ~~0.037~~ | ~~.~~ | ~~0.0279~~ | ~~.~~ | ~~0.0497~~ | ~~0.1871~~ | ~~.~~ | ~~49.76~~ | ~~.~~ | ~~0.014~~ |
| ~~1~~ | ~~GIOP-113~~ | ~~32.11~~ | ~~.~~ | ~~.~~ | ~~0.5359~~ | ~~.~~ | ~~2.403~~ | ~~.~~ | ~~0.0218~~ | ~~.~~ | ~~2.343~~ | ~~0.1712~~ | ~~.~~ | ~~0.0276~~ | ~~.~~ | ~~0.0793~~ | ~~0.453~~ | ~~.~~ | ~~48.98~~ | ~~.~~ | ~~0.0298~~ |
| ~~1~~ | ~~GIOP-99~~ | ~~31.7~~ | ~~.~~ | ~~.~~ | ~~0.2553~~ | ~~.~~ | ~~1.5672~~ | ~~.~~ | ~~0.039~~ | ~~.~~ | ~~1.967~~ | ~~0.0248~~ | ~~.~~ | ~~0.0197~~ | ~~.~~ | ~~0.1006~~ | ~~0.003~~ | ~~.~~ | ~~51.54~~ | ~~.~~ | ~~0.0278~~ |
| ~~1~~ | ~~GIOP-105~~ | ~~31.04~~ | ~~.~~ | ~~.~~ | ~~0.438~~ | ~~.~~ | ~~1.841~~ | ~~.~~ | ~~0.075~~ | ~~.~~ | ~~2.289~~ | ~~0.0446~~ | ~~.~~ | ~~0.0238~~ | ~~.~~ | ~~0.0876~~ | ~~0.1507~~ | ~~.~~ | ~~51.51~~ | ~~.~~ | ~~0.0374~~ |
| 1 | **IMS-440** | 30.93 | . | . | 0.53 | . | 0.580 | . | 0.078 | . | 0.844 | 0.092 | . | . | 0.071 | 0.045 | 0.054 | . | 53.85 | . | 0.040 |
| 1 | IRSID 607-1 | 30.89 | . | 2.48 | . | 13.74 | . | . | . | 0.77 | . | 0.254 | . | . | . | 0.529 | 0.050 | 3.07 | . | 0.123 | . |
| 1 | NCS HC19819 | 30.08 | . | . | 4.15 | . | 1.79 | . | . | . | 3.41 | . | 8.36 | . | . | 0.026 | 0.201 | . | 15.79 | . | 11.37 |

| Number | As | Ba | $CO_2$ | Cl | Co | Cr | $Cr_2O_3$ | Cu | Ni | NiO | Pb | V | $V_2O_5$ | Zn | ZnO | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IRSID 612-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC18020 | 0.051 | . | . | . | . | . | . | . | . | . | 0.208 | . | . | 0.223 | . | . | . | 100 g | |
| IMS PBS-30 | (0.002) | 0.088 | . | (0.008) | (0.015) | . | (0.007) | (0.002) | (0.007) | . | (0.004) | (0.004) | . | (0.005) | . | (0.007) | 10.80 | 250 g | |
| GIOP-131 | (0.001) | 0.0081 | . | 0.004 | (0.0015) | 0.009 | . | (0.0017) | 0.00236 | . | (0.0016) | 0.0166 | . | 0.00326 | . | 0.0173 | 5.405 | 10 g | Sr: 0.0086 |
| NCS DC73003 | . | . | . | . | . | . | . | 0.028 | . | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC28065 | . | . | . | . | 0.085 | 1.71 | . | . | 1.30 | . | . | . | . | . | . | . | . | 50 g | |
| CGL 133 | (0.0036) | (0.0042) | . | . | 0.0072 | 0.0027 | . | 0.0397 | 0.0081 | . | (0.0021) | 0.0054 | . | 0.0234 | . | . | (10.22) | 100 g | $P_2O_5$:0.063 |
| KZ 182-89 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| ~~VS R8/3~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.06)~~ | ~~.~~ | ~~2.53~~ | ~~.~~ | ~~.~~ | ~~0.67~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~10.4~~ | ~~75 g~~ | |
| IMZ 265/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| IRSID 601-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC13033 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g | |
| KZ 183-89 | . | 3.10 | . | . | . | . | . | . | . | . | 0.026 | . | . | . | . | . | . | 100 g | Ge: 36.6* |
| VS R20/3 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC28069 | . | . | . | . | 0.13 | 1.48 | . | . | 1.50 | . | . | . | . | . | . | . | . | 50 g | |
| NCS DC11013 | 0.0003 | . | . | . | . | . | . | 0.0031 | . | . | 0.028 | . | . | 0.0045 | . | . | . | 70 g | |
| VS R24/2 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 or 125 g | |
| VS R9/1 | . | . | CO3:(11.0) | | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| ~~GIOP-110~~ | ~~(0.0032)~~ | ~~(0.0046)~~ | ~~.~~ | ~~(0.0047)~~ | ~~(0.0032)~~ | ~~(0.0048)~~ | ~~.~~ | ~~(0.0055)~~ | ~~(0.0064)~~ | ~~.~~ | ~~(0.0022)~~ | ~~(0.001)~~ | ~~.~~ | ~~0.0031~~ | ~~.~~ | ~~(0.0015)~~ | ~~1.17~~ | ~~10 g~~ | |
| **IMS-441** | (0.001) | 0.010 | . | (0.004) | (0.002) | 0.016 | . | 0.001 | 0.007 | . | (0.002) | 0.003 | . | 0.004 | . | 0.003 | 6.21 | 10 g | Sr: 0.006 **17034** |
| ~~GIOP-98~~ | ~~(0.0044)~~ | ~~0.0067~~ | ~~.~~ | ~~(0.0045)~~ | ~~(0.0037)~~ | ~~(<0.01)~~ | ~~.~~ | ~~(0.0047)~~ | ~~(0.004)~~ | ~~.~~ | ~~(0.0062)~~ | ~~(0.001)~~ | ~~.~~ | ~~(0.0041)~~ | ~~.~~ | ~~(0.002)~~ | ~~-1.217~~ | ~~10 g~~ | |
| NCS HC19820 | . | . | . | . | . | . | 2.00 | . | . | . | . | . | 1.78 | . | . | . | . | 100 g | |
| ~~GIOP-107~~ | ~~(0.0044)~~ | ~~(0.0047)~~ | ~~.~~ | ~~0.0058~~ | ~~(0.0028)~~ | ~~(0.0026)~~ | ~~.~~ | ~~(0.0045)~~ | ~~(0.0032)~~ | ~~.~~ | ~~(0.0032)~~ | ~~(0.0017)~~ | ~~.~~ | ~~0.0047~~ | ~~.~~ | ~~(0.0022)~~ | ~~-1.224~~ | ~~10 g~~ | |
| ~~GIOP-113~~ | ~~(0.0033)~~ | ~~(0.0042)~~ | ~~.~~ | ~~0.0117~~ | ~~0.0034~~ | ~~(0.0019)~~ | ~~.~~ | ~~(0.0048)~~ | ~~(0.0048)~~ | ~~.~~ | ~~(0.0042)~~ | ~~(0.0021)~~ | ~~.~~ | ~~0.0107~~ | ~~.~~ | ~~(0.0021)~~ | ~~-0.719~~ | ~~10 g~~ | |
| ~~GIOP-99~~ | ~~(0.0055)~~ | ~~(0.0041)~~ | ~~.~~ | ~~(0.0045)~~ | ~~(0.0032)~~ | ~~(0.0046)~~ | ~~.~~ | ~~(0.0051)~~ | ~~(0.003)~~ | ~~.~~ | ~~(0.0032)~~ | ~~(0.0016)~~ | ~~.~~ | ~~(0.0036)~~ | ~~.~~ | ~~(0.0023)~~ | ~~-0.984~~ | ~~10 g~~ | |
| GIOP-105 | (0.004) | 0.0077 | . | 0.0078 | (0.0032) | (0.0036) | . | (0.004) | (0.003) | . | (0.0026) | (0.0023) | . | (0.0049) | . | (0.0021) | -0.997 | 10 g | |
| **IMS-440** | (0.002) | (0.002) | . | 0.010 | (0.002) | 0.004 | . | 0.002 | (0.002) | . | 0.003 | (0.002) | . | 0.002 | . | 0.004 | -0.55 | 10 g | **17034** |
| IRSID 607-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS HC19819 | . | . | . | . | . | . | 2.60 | . | . | . | . | . | 2.20 | . | . | . | . | 100 g | |

## CRM IRON ORE, chart 9 of 9

# = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | Fe | FeO | Al | $Al_2O_3$ | Ca | CaO | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | P | S | Si | $SiO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | IMZ 266/1 | 29.04 | . | . | 3.13 | . | 3.42 | . | . | . | 0.95 | . | 0.078 | . | . | 0.030 | 0.10 | . | 44.94 | . | . |
| ~~1~~ | ~~GIOP-104~~ | ~~29.83~~ | ~~.~~ | ~~.~~ | ~~0.526~~ | ~~.~~ | ~~2.168~~ | ~~.~~ | ~~0.0409~~ | ~~.~~ | ~~2.535~~ | ~~0.0762~~ | ~~.~~ | ~~0.0235~~ | ~~.~~ | ~~0.1065~~ | ~~0.2414~~ | ~~.~~ | ~~52.59~~ | ~~.~~ | ~~0.0283~~ |
| ~~1~~ | ~~GIOP-112~~ | ~~29.46~~ | ~~.~~ | ~~.~~ | ~~0.405~~ | ~~.~~ | ~~2.047~~ | ~~.~~ | ~~0.0267~~ | ~~.~~ | ~~2.323~~ | ~~0.0678~~ | ~~.~~ | ~~0.0248~~ | ~~.~~ | ~~0.0876~~ | ~~0.3007~~ | ~~.~~ | ~~53.57~~ | ~~.~~ | ~~0.0207~~ |
| 1 | GIOP-97 | 28.234 | . | . | 0.746 | . | 3.028 | . | 0.0522 | . | 2.093 | 0.0742 | . | 0.0552 | . | 0.0396 | 0.554 | . | 54.4 | . | 0.0279 |
| 1 | VS R39 | 28.03 | . | . | 3.92 | . | 1.69 | . | 1.29 | . | 1.97 | . | 0.069 | . | 0.083 | 0.073 | 0.245 | . | 49.1 | . | 0.155 |
| 1 | GIOP-96 | 27.442 | . | . | 0.723 | . | 2.884 | . | 0.051 | . | 2.819 | 0.107 | . | 0.038 | . | 0.0507 | 0.94 | . | 54.38 | . | 0.0289 |
| 1 | NCS DC28071 | 25.15 | 20.15 | . | 6.68 | . | 11.80 | . | . | . | 12.48 | 0.54 | . | . | . | 0.017 | 0.22 | . | 29.18 | . | 0.17 |
| ~~1~~ | ~~GIOP-95~~ | ~~24.215~~ | ~~34.86~~ | ~~.~~ | ~~1.259~~ | ~~.~~ | ~~4.804~~ | ~~.~~ | ~~0.0806~~ | ~~.~~ | ~~4.374~~ | ~~0.2045~~ | ~~.~~ | ~~0.049~~ | ~~.~~ | ~~0.066~~ | ~~0.497~~ | ~~.~~ | ~~54.85~~ | ~~.~~ | ~~0.0584~~ |
| 1 | ECRM 651-1 | 23.85 | . | 2.25 | . | 16.15 | . | 0.27 | . | 1.04 | . | 0.97 | . | 0.05 | . | 0.35 | 0.40 | 3.46 | . | 0.10 | . |
| 1 | **IMS PBS-310** | 22.98 | . | . | 14.20 | . | 2.84 | . | 0.981 | . | 2.64 | 1.73 | . | . | 1.70 | 0.040 | 0.027 | . | 30.24 | . | 0.830 |
| ~~1~~ | ~~GIOP-139~~ | ~~22.43~~ | ~~.~~ | ~~.~~ | ~~4.974~~ | ~~.~~ | ~~1.316~~ | ~~.~~ | ~~2.617~~ | ~~.~~ | ~~1.978~~ | ~~0.068~~ | ~~.~~ | ~~0.5068~~ | ~~.~~ | ~~0.0995~~ | ~~0.39~~ | ~~.~~ | ~~53.76~~ | ~~.~~ | ~~0.1922~~ |
| 1 | NCS DC73001 | 20.17 | (7.5) | . | 3.57 | . | 2.84 | . | 0.53 | . | 1.68 | 0.168 | . | . | 0.28 | 0.045 | 0.051 | . | 60.86 | 0.085 | . |
| 2 | IMZ 267/1 | 19.75 | . | . | 4.05 | . | 4.73 | . | . | . | 1.22 | (0.16) | 0.16 | . | . | 0.030 | 0.17 | . | 53.72 | . | . |
| 1 | NCS DC28070 | 19.43 | 10.20 | . | 7.10 | . | 20.02 | . | . | . | 11.58 | 0.50 | . | . | . | 0.024 | 0.35 | . | 28.78 | . | 0.24 |
| 1 | NCS DC28068 | 16.83 | 0.10 | . | 2.06 | . | 0.16 | . | . | . | 21.32 | 0.40 | . | . | . | 0.0018 | 0.025 | . | 34.93 | . | 0.043 |
| 1 | GIOP-128 | 16.494 | . | . | 34.64 | . | 0.0207 | . | 0.1797 | . | 0.035 | 0.0336 | . | 0.0194 | . | 0.012 | 0.0518 | . | 21.726 | . | 1.581 |

| Number | As | Ba | Cl | Co | Cr | Cu | Ni | Pb | V | $V_2O_5$ | Zn | Zr | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IMZ 266/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| ~~GIOP-104~~ | ~~(0.006)~~ | ~~(0.0047)~~ | ~~0.0099~~ | ~~(0.0031)~~ | ~~(0.0013)~~ | ~~(0.0043)~~ | ~~(0.0045)~~ | ~~(0.0042)~~ | ~~(0.0016)~~ | ~~.~~ | ~~0.006~~ | ~~(0.0017)~~ | ~~-0.992~~ | ~~10 g~~ | |
| ~~GIOP-112~~ | ~~(0.0063)~~ | ~~(0.0038)~~ | ~~0.0104~~ | ~~(0.0033)~~ | ~~(0.0016)~~ | ~~(0.0045)~~ | ~~(0.0031)~~ | ~~(0.0045)~~ | ~~(0.0013)~~ | ~~.~~ | ~~0.0061~~ | ~~(0.002)~~ | ~~-0.922~~ | ~~10 g~~ | |
| GIOP-97 | (0.0085) | (0.0037) | 0.0095 | (0.003) | (0.0011) | 0.0062 | (0.004) | (0.0041) | (0.0012) | . | 0.006 | (0.0021) | -0.92 | 10 g | |
| VS R39 | 23.1% Iron Magnetite . | | | . | . | . | . | . | . | . | . | . | . | 100 g | $Fe_2O_3$: 14.96 |
| GIOP-96 | (0.0081) | (0.0059) | 0.0201 | (0.0032) | (0.0034) | (0.0064) | (0.0046) | (0.004) | (0.0018) | . | 0.0076 | (0.0027) | -0.454 | 10 g | |
| NCS DC28071 | . | . | . | 0.066 | 1.16 | . | 1.41 | . | . | . | . | . | . | 50 g | |
| ~~GIOP-95~~ | ~~(0.0084)~~ | ~~(0.002)~~ | ~~0.0184~~ | ~~(0.0031)~~ | ~~(0.0031)~~ | ~~0.005~~ | ~~(0.0055)~~ | ~~(0.0056)~~ | ~~(0.003)~~ | ~~.~~ | ~~0.0087~~ | ~~(0.002)~~ | ~~-0.546~~ | ~~10 g~~ | |
| ECRM 651-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| **IMS PBS-310** | (0.003) | 0.021 | 1.73 | (0.004) | 0.012 | 0.007 | 0.009 | (0.004) | (0.013) | . | 0.007 | (0.020) | 10.93 | 10 g | **17034** |
| ~~GIOP-139~~ | ~~0.0075~~ | ~~0.0183~~ | ~~(0.006)~~ | ~~(0.0017)~~ | ~~(0.0023)~~ | ~~0.0041~~ | ~~(0.0019)~~ | ~~0.0054~~ | ~~0.00332~~ | ~~.~~ | ~~0.155~~ | ~~0.0081~~ | ~~1.63~~ | ~~10 g~~ | ~~Sr: 0.0101~~ |
| NCS DC73001 | . | . | . | . | . | 0.0028 | . | . | . | . | . | . | . | 50 g | |
| IMZ 267/1 | . | . | . | . | . | . | . | . | . | . | . | . | . | 100 g | |
| NCS DC28070 | . | . | . | 0.055 | 0.81 | . | 1.07 | . | . | . | . | . | . | 50 g | |
| NCS DC28068 | . | . | . | 0.064 | 0.81 | . | 1.74 | . | . | . | . | . | . | 50 g | |
| GIOP-128 | 0.0034 | (0.0063) | 0.0085 | (0.0095) | 0.0151 | (0.004) | (0.0038) | (0.0066) | 0.0424 | . | (0.0033) | 0.049 | 17.964 | 10 g | Sr: 0.0047 |

## CRM COARSE AND RAW IRON ORE

2kg of raw, coarse material

| Number | Fe | $Al_2O_3$ | CaO | $K_2O$ | MgO | Mn | Na | P | S | $SiO_2$ | Sr | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIOC-16 | 57.72 | 2.69 | 0.041 | 0.040 | 0.096 | 0.537 | (0.016) | 0.069 | 0.026 | 5.13 | (0.002) | 0.183 | 8.30 |
| GIOC-15 | 57.43 | 3.40 | 0.047 | 0.021 | 0.080 | 0.361 | (0.011) | 0.117 | 0.068 | 4.24 | (0.002) | 0.166 | 9.01 |
| GIOC-8 | 57.28 | 2.42 | 0.120 | 0.006 | 0.145 | 0.072 | (0.011) | 0.040 | 0.014 | 5.38 | 0.051 | 0.147 | 9.66 |

| Number | As | Ba | Cl | Co | Cr | Cu | Ni | Pb | Sn | V | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIOC-16 | (0.002) | (0.007) | 0.007 | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.001) | 0.004 | (0.004) | (0.005) |
| GIOC-15 | 0.007 | (0.005) | 0.008 | (0.002) | (0.002) | (0.003) | (0.003) | (0.002) | (0.001) | 0.003 | (0.003) | 0.007 |
| GIOC-8 | 0.002 | (0.002) | (0.004) | (0.001) | (0.002) | (0.001) | (0.002) | (0.002) | (0.006) | (0.003) | 0.007 | (0.005) |

## IRON ORE SINTER

# = class, where 1 = CRM and 2 = RM analysis listed in mass %

| # | Number | Fe | FeO | Al | $Al_2O_3$ | C | $CO_2$ | Ca | CaO | $Cr_2O_3$ | Cu | CuO | F | K | $K_2O$ | Mg | MgO | LOI 900'C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | DH 5630 | 60.62 | 4.86 | . | 1.134 | . | . | . | 6.99 | . | . | . | . | . | 0.040 | . | 0.654 | . |
| 2 | DH 5635 | 59.22 | 5.27 | . | 1.392 | . | . | . | 6.11 | 0.031 | . | . | . | . | 0.066 | . | 0.882 | 1.27 |
| 2 | DH 5631 | 58.54 | 5.41 | . | 1.43 | . | . | . | 6.28 | . | . | . | . | . | 0.247 | . | 2.01 | . |
| 1 | NCS DC14203 | 57.63 | 10.80 | . | 1.37 | . | . | . | 8.17 | . | 0.0063 | . | . | . | 0.065 | . | 1.65 | . |
| 2 | DH 5616 | 57.29 | 6.58 | . | 1.331 | . | . | . | 9.51 | 0.045 | . | . | . | . | 0.045 | . | 1.491 | . |
| ~~1~~ | ~~JSS 851-5~~ | ~~56.67~~ | ~~.~~ | ~~0.89~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~7.94~~ | ~~.~~ | ~~Cr:0.0163~~ | ~~0.0034~~ | ~~.~~ | ~~Fe II: 5.99~~ | ~~.~~ | ~~.~~ | ~~0.48~~ | ~~.~~ | ~~0.041~~ |
| 1 | NCS DC28231 | 56.53 | 22.9 | . | 1.90 | . | . | . | 11.46 | . | . | . | . | . | . | . | 1.75 | . |
| 1 | NCS DC28046 | 56.14 | 9.17 | . | 2.07 | . | . | . | 10.35 | . | . | . | . | . | 0.125 | . | 2.21 | . |
| 1 | NCS DC14009a | 55.58 | 20.06 | . | 2.38 | . | . | . | 3.62 | . | 0.017 | . | . | . | 0.316 | . | 5.99 | . |
| 1 | NCS DC28046a | 55.49 | 7.93 | . | 1.84 | . | . | . | 11.66 | . | 0.0034 | . | . | . | 0.045 | . | 2.83 | . |
| 1 | NCS DC11024 | 55.37 | (8.20) | . | 2.19 | . | . | . | 10.76 | . | . | . | . | . | 0.082 | . | 2.14 | . |
| 2 | BS 104 | 55.32 | . | . | 1.26 | . | . | . | 8.72 | . | . | . | . | . | (0.15) | . | 3.06 | . |
| 1 | NCS DC28038 | 55.19 | 6.23 | . | 1.83 | . | . | . | 9.19 | . | . | . | . | . | 0.070 | . | 2.22 | . |
| 1 | NCS DC28023a | 53.10 | 7.49 | . | 2.76 | . | . | . | 11.78 | . | . | . | . | . | 0.079 | . | 2.69 | . |
| 2 | DH 5632 | 55.03 | 4.06 | . | 1.281 | . | . | . | 10.79 | . | . | . | . | . | 0.174 | . | 2.070 | . |
| 1 | **BS 104A** | 54.8 | . | . | 1.04 | 0.22 | . | . | 10.5 | . | . | . | . | . | 0.14 | . | 1.24 | . |
| 1 | BCS 377/6 | 54.78 | . | 0.783 | . | . | . | 5.74 | . | Cr:0.0154 | . | . | . | . | . | 0.907 | . | . |
| 1 | NCS DC14204 | 54.62 | 9.26 | . | 1.49 | . | . | . | 9.29 | . | 0.014 | . | . | . | 0.046 | . | 1.74 | . |
| ~~1~~ | ~~NCS DC28023b~~ | ~~53.74~~ | ~~8.52~~ | ~~.~~ | ~~3.05~~ | ~~As:0.020~~ | ~~.~~ | ~~Cr:0.021~~ | ~~9.67~~ | ~~.~~ | ~~0.017~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.145~~ | ~~.~~ | ~~3.45~~ | ~~.~~ |
| 1 | NCS DC28050 | 53.26 | 9.53 | . | 2.24 | . | . | . | 11.31 | . | . | . | . | . | 0.084 | . | 2.70 | . |
| 1 | NCS DC14202 | 52.77 | 6.55 | . | 2.54 | . | . | . | 11.33 | . | 0.012 | . | . | . | 0.078 | . | 2.02 | . |
| 1 | NCS DC28049 | 52.16 | 8.06 | . | 2.17 | . | . | . | 13.05 | . | . | . | . | . | 0.082 | . | 1.63 | . |
| 1 | NCS DC14206 | 51.13 | 9.22 | . | 2.44 | . | . | . | 9.46 | . | (0.007) | . | . | . | 0.080 | . | 4.40 | . |
| 1 | NCS DC28047 | 50.04 | 8.07 | . | 2.11 | . | . | . | 13.72 | . | . | . | . | . | 0.091 | . | 2.08 | . |
| 1 | JSS 851-6 | 54.16 | FeII: 7.55% | | 1.06 | . | . | 9.30 | . | Cr:0.0239 | 0.0039 | . | . | . | . | 0.644 | . | (0.147) |
| 1 | ECRM 676-1 | 39.76 | . | 3.40 | . | . | . | 12.78 | . | . | . | . | 0.10 | 0.43 | . | 1.16 | . | . |

continued analysis listed in mass % except * which is mg/kg

| Number | Mn | MnO | Na | $Na_2O$ | Ni* | NiO | P | $P_2O_5$ | PbO | S | Si | $SiO_2$ | SrO | Ti | $TiO_2$ | V | $V_2O_5$ | ZnO | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH 5630 | 0.298 | . | . | 0.032 | . | . | . | 0.112 | . | 0.011 | . | 3.98 | . | . | 0.085 | . | . | 0.016 | 100 g |
| DH 5635 | 0.368 | . | . | 0.047 | . | . | . | 0.120 | . | 0.013 | . | 4.81 | . | . | 0.224 | . | . | 0.010 | 100 g |
| DH 5631 | 0.945 | . | . | . | . | . | . | 0.107 | . | . | . | 5.08 | . | . | 0.076 | . | . | 0.040 | 100 g |
| NCS DC14203 | 0.174 | . | . | 0.046 | . | . | 0.102 | . | . | 0.025 | . | 5.38 | . | 0.113 | . | . | . | . | 50 g |
| DH 5616 | 0.477 | . | . | 0.025 | . | . | . | 0.140 | . | . | . | 5.18 | . | . | 0.101 | . | 0.018 | 0.013 | 100 g |
| ~~JSS 851-5~~ | ~~0.241~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~58~~ | ~~.~~ | ~~0.060~~ | ~~.~~ | ~~.~~ | ~~0.016~~ | ~~2.48~~ | ~~.~~ | ~~.~~ | ~~0.065~~ | ~~.~~ | ~~0.0084~~ | ~~.~~ | ~~Zn:0.0075~~ | ~~100 g~~ |
| NCS DC28231 | . | 0.202 | . | . | . | . | 0.027 | . | . | 0.063 | . | 5.57 | . | . | 0.103 | . | . | . | 50 g |
| NCS DC28046 | 0.227 | . | . | 0.048 | . | . | 0.064 | . | . | 0.032 | . | 5.54 | . | 0.076 | . | . | . | . | 70 g |
| NCS DC14009a | . | 0.097 | . | 0.068 | . | . | 0.017 | . | . | 0.106 | . | 9.95 | . | . | 0.266 | . | . | 0.011 | 50 g |
| NCS DC28046a | . | 0.289 | . | 0.034 | . | . | 0.045 | . | . | 0.040 | . | 4.85 | . | . | 0.109 | . | . | 0.0078 | 50 g |
| NCS DC11024 | . | 0.36 | . | 0.045 | . | . | 0.056 | . | . | 0.017 | . | 5.64 | . | . | 0.125 | . | . | 0.0062 | 70 g |
| BS 104 | . | 0.79 | . | (0.06) | . | . | . | 0.127 | . | 0.011 | . | 7.70 | . | . | 0.08 | . | . | . | 100 g |
| NCS DC28038 | 0.222 | . | . | 0.057 | . | . | 0.057 | . | . | 0.028 | . | 6.79 | . | 0.123 | . | . | . | . | 70 g |
| NCS DC28023a | . | 0.740 | . | 0.049 | . | . | 0.059 | . | . | 0.042 | . | 6.49 | . | . | 0.144 | . | . | . | 50 g |
| DH 5632 | 0.708 | . | . | . | . | . | . | 0.104 | . | 0.059 | . | 5.55 | . | . | 0.068 | . | . | 0.026 | 100 g |
| **BS 104A** | . | 1.06 | . | 0.022 | . | . | . | 0.101 | . | 0.015 | . | 7.97 | . | . | 0.094 | . | . | **17025** | 100 g |
| BCS 377/6 | 0.604 | . | . | . | . | . | 0.0586 | . | Pb:0.1485 | . | 2.982 | . | . | 0.1001 | . | 0.0178 | . | Zn:1.002 | 100 g |
| NCS DC14204 | 0.193 | . | . | 0.019 | . | . | 0.039 | . | . | 0.024 | . | 7.94 | . | 0.092 | . | . | . | . | 50 g |
| ~~NCS DC28023b~~ | ~~.~~ | ~~0.185~~ | ~~.~~ | ~~0.090~~ | ~~.~~ | ~~.~~ | ~~0.036~~ | ~~.~~ | ~~Pb:0.012~~ | ~~0.022~~ | ~~.~~ | ~~7.11~~ | ~~.~~ | ~~.~~ | ~~0.290~~ | ~~.~~ | ~~last~~ | ~~0.018~~ | ~~50 g~~ |
| NCS DC28050 | 0.286 | . | . | 0.44 | . | . | 0.049 | . | . | 0.075 | . | 6.24 | . | 0.082 | . | . | . | . | 70 g |
| NCS DC14202 | 0.199 | . | . | 0.033 | . | . | 0.060 | . | . | 0.033 | . | 7.51 | . | 0.062 | . | . | . | . | 50 g |
| NCS DC28049 | 0.440 | . | . | 0.38 | . | . | 0.024 | . | . | 0.096 | . | 6.92 | . | 0.067 | . | . | . | . | 70 g |
| NCS DC14206 | 0.179 | . | . | 0.040 | . | . | 0.066 | . | . | 0.059 | . | 8.58 | . | 0.094 | . | . | . | . | 50 g |
| NCS DC28047 | 0.390 | . | . | 0.53 | . | . | 0.028 | . | . | 0.125 | . | 7.60 | . | 0.067 | . | . | . | . | 70 g |
| JSS 851-6 | 0.345 | . | . | . | 30.3 | . | 0.076 | . | . | 0.0298 | 2.76 | . | . | 0.111 | . | 0.0164 | . | Zn:0.0134 | 100 g |
| ECRM 676-1 | 0.83 | . | 0.095 | . | . | . | 0.59 | . | . | 0.12 | 6.40 | . | . | 0.19 | . | 0.070 | . | . | 100 g |

## CRM KAOLIN

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | CaO | $Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC72002 | 58.47 | 27.16 | 1.01 | 0.80 | . | 0.90 | 0.29 | 0.019 | 0.19 | 0.22 | 0.43 | 0.30 | 10.11 | 1 kg |
| UNS KK | 47.06 | 36.77 | 0.236 | 0.982 | 12.75 | 1.063 | 0.192 | 0.015 | 0.032 | . | . | 0.166 | . | 100 g |
| NCS DC60123a | 45.30 | 37.70 | 0.064 | 0.35 | 15.26 | 0.042 | 0.021 | 0.0018 | 0.045 | 0.16 | 0.76 | 0.060 | 14.81 | 50 g |
| NCS DC72001 | 44.67 | 36.53 | 0.17 | 0.63 | . | 0.70 | 0.14 | 0.005 | 0.11 | 0.17 | 3.13 | 0.14 | 16.09 | 1 kg |
| NCS DC60122a | 43.41 | 34.77 | 0.038 | 1.50 | 13.24 | 0.78 | 0.069 | 0.0020 | 0.045 | 0.21 | 5.51 | 0.25 | 17.31 | 50 g |

## CRM KIMBERLITE WITH EXTENSIVE ANALYSIS

analysis listed in mass % 70 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3T$ | $H_2O+$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71312 | 3.73 | (16.78) | 12.64 | 3.71 | (6.53) | (4.47) | 0.49 | 17.56 | (0.1) | 0.30 | 0.68 | 35.88 | 0.71 | 20.73 |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Cd | Ce | Cl% | Co | Cr | Cs | Cu | Dy | Er | Eu | F% | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71312 | (0.06) | 3.5 | (31.8) | (0.177) | 1.3 | (0.1) | 0.46 | 127 | (0.04) | 40.0 | 795 | 5.2 | 26.2 | 2.6 | (1.2) | 1.6 | (0.11) | 7.1 | 4.7 |

| Number | Ge | Hf | Hg | Ho | La | Li | Lu | Mn% | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se | Sm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71312 | 0.89 | 4.9 | 0.010 | 0.49 | 69.8 | 75.7 | 0.16 | (0.09) | 1.4 | 60.4 | 49.0 | 516 | 20.7 | 13.8 | 28.4 | (0.22) | 10.9 | 0.10 | 6.5 |

| Number | Sn | Sr | Ta | Tb | Th | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71312 | 1.7 | 262 | 3.9 | 0.54 | 10.8 | 0.17 | 2.2 | 86 | 2.4 | 11.6 | 1.1 | 190 | 182 |

## CRM LATERITE - NICKEL ORE

analysis listed in mass %, ICP values by fusion ICP, C and S: <0.01% from IR combustion furnace, all others fusion XRF including Cl: <50 ppm 10g or 1kg

| Number | Ni | Co | $Al_2O_3$ | C | CaO | $Cr_2O_3$ | Cu | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 195 | 2.94 | 0.0477 | 3.13 | 0.08 | 0.390 | 0.958 | <0.0050 | 18.29 | <0.01 | 19.01 | 0.288 | 0.034 | <0.01 | <0.01 | 44.00 | 0.037 | 0.0300 | 9.71 |
| OREAS 195 ICP | 2.89 | 0.0465 | 3.07 | . | 0.397 | 0.938 | (0.0050) | 18.16 | <0.1 | 18.88 | 0.285 | (0.03) | <0.01 | <0.05 | 43.30 | 0.037 | 0.0293 | . |
| OREAS 194 | 2.13 | 0.0428 | 2.74 | 0.07 | 0.311 | 0.819 | (0.0040) | 16.47 | <0.01 | 22.83 | 0.261 | (0.03) | <0.01 | <0.01 | 43.02 | 0.035 | 0.0174 | 10.53 |
| OREAS 194 ICP | 2.10 | 0.0424 | 2.73 | . | 0.32 | 0.814 | 0.0041 | 16.42 | <0.01 | 22.77 | 0.262 | 0.027 | <0.01 | <0.05 | 42.90 | 0.033 | 0.0184 | . |
| OREAS 193 | 1.93 | 0.0495 | 3.08 | 0.07 | 0.362 | 0.962 | <0.0050 | 19.51 | <0.01 | 20.25 | 0.317 | (0.03) | 0.012 | <0.01 | 42.72 | 0.053 | 0.0219 | 9.87 |
| OREAS 193 ICP | 1.91 | 0.0483 | 3.05 | . | 0.373 | 0.956 | (0.0040) | 19.49 | (0.08) | 20.26 | 0.316 | 0.030 | <0.02 | <0.05 | 42.49 | 0.051 | 0.0199 | . |
| OREAS 192 | 1.77 | 0.0404 | 2.76 | 0.07 | 0.313 | 0.913 | <0.0050 | 18.10 | <0.01 | 21.32 | 0.277 | 0.028 | <0.01 | (0.004) | 43.58 | 0.036 | 0.0176 | 10.17 |
| OREAS 192 ICP | 1.75 | 0.0398 | 2.75 | . | 0.316 | 0.910 | (0.0038) | 18.14 | <0.1 | 21.26 | 0.278 | 0.022 | <0.02 | <0.02 | 43.45 | 0.033 | 0.0193 | . |
| OREAS 191 | 1.75 | 0.0665 | 4.27 | 0.09 | 0.276 | 1.22 | (0.0050) | 24.86 | <0.01 | 10.06 | 0.397 | (0.02) | <0.01 | <0.01 | 47.97 | 0.052 | 0.0302 | 8.10 |
| OREAS 191 ICP | 1.73 | 0.0652 | 4.19 | . | 0.287 | 1.21 | (0.0050) | 24.63 | (0.1) | 9.95 | 0.397 | 0.018 | <0.02 | <0.05 | 47.67 | 0.050 | 0.0297 | . |
| OREAS 190 | 1.64 | 0.0889 | 6.00 | 0.07 | 0.133 | 1.73 | (0.0070) | 35.48 | <0.01 | 6.91 | 0.577 | (0.02) | <0.01 | <0.01 | 38.22 | 0.064 | 0.0353 | 8.38 |
| OREAS 190 ICP | 1.62 | 0.0875 | 5.86 | . | 0.133 | 1.71 | 0.0068 | 35.40 | <0.01 | 6.85 | 0.574 | (0.01) | <0.02 | <0.02 | 38.06 | 0.062 | 0.0327 | . |
| OREAS 189 | 1.48 | 0.0326 | 2.09 | 0.10 | 0.326 | 0.765 | <0.0050 | 15.04 | <0.01 | 23.09 | 0.227 | (0.03) | <0.01 | <0.01 | 46.20 | 0.029 | 0.0125 | 10.13 |
| OREAS 189 ICP | 1.47 | 0.0327 | 2.08 | . | 0.328 | 0.764 | (0.0030) | 14.94 | (0.08) | 23.06 | 0.228 | 0.021 | <0.02 | <0.05 | 46.08 | 0.026 | 0.0103 | . |
| OREAS 187 | 1.37 | 0.0636 | 2.80 | 0.11 | 0.341 | 0.987 | (0.0040) | 19.45 | <0.01 | 17.99 | 0.356 | <0.03 | <0.01 | <0.01 | 46.66 | 0.033 | 0.0196 | 9.27 |
| OREAS 187 ICP | 1.37 | 0.0629 | 2.77 | . | 0.352 | 0.987 | <0.0050 | 19.40 | <0.1 | 17.96 | 0.358 | <0.03 | <0.02 | <0.05 | 46.37 | (0.03) | 0.0190 | . |
| OREAS 186 | 1.23 | 0.0692 | 5.19 | 0.07 | 0.562 | 1.42 | 0.0061 | 32.04 | <0.01 | 4.89 | 0.522 | (0.02) | (0.01) | <0.01 | 46.29 | 0.069 | 0.0265 | 6.83 |
| OREAS 186 ICP | 1.22 | 0.0680 | 5.11 | . | 0.564 | 1.41 | 0.0057 | 31.72 | <0.1 | 4.82 | 0.519 | <0.01 | <0.02 | <0.05 | 46.24 | 0.070 | 0.0276 | . |
| OREAS 185 | 1.14 | 0.0388 | 2.48 | 0.10 | 0.385 | 0.914 | <0.0050 | 18.42 | <0.01 | 20.22 | 0.297 | 0.027 | <0.01 | <0.01 | 45.93 | 0.033 | 0.0143 | 9.61 |
| OREAS 185 ICP | 1.12 | 0.0385 | 2.47 | . | 0.39 | 0.91 | <0.0050 | 18.27 | <0.01 | 20.17 | 0.295 | 0.024 | <0.02 | <0.05 | 45.58 | 0.031 | 0.0128 | . |
| OREAS 184 | 1.02 | 0.0903 | 4.62 | 0.07 | 0.216 | 1.75 | 0.0070 | 39.30 | <0.01 | 3.05 | 0.676 | <0.01 | 0.017 | <0.01 | 42.25 | 0.060 | 0.0278 | 6.24 |
| OREAS 184 ICP | 1.02 | 0.0899 | 4.58 | . | 0.231 | 1.75 | 0.0060 | 39.42 | <0.1 | 3.00 | 0.678 | <0.01 | (0.02) | <0.05 | 42.19 | 0.058 | 0.0287 | . |
| OREAS 183 | 0.995 | 0.0225 | 1.60 | 0.22 | 0.710 | 0.653 | <0.0030 | 12.73 | <0.01 | 27.31 | 0.180 | (0.03) | 0.005 | <0.01 | 44.49 | 0.023 | 0.0078 | 10.90 |
| OREAS 183 ICP | 0.983 | 0.0222 | 1.60 | . | 0.72 | 0.651 | 0.0021 | 12.72 | <0.1 | 27.43 | 0.181 | 0.030 | <0.01 | <0.02 | 44.13 | 0.020 | 0.0082 | . |
| ~~OREAS 182~~ | ~~0.707~~ | ~~0.0728~~ | ~~4.07~~ | ~~0.09~~ | ~~0.251~~ | ~~1.29~~ | ~~0.0052~~ | ~~29.40~~ | ~~<0.01~~ | ~~9.16~~ | ~~0.580~~ | ~~0.019~~ | ~~0.010~~ | ~~0.006~~ | ~~46.77~~ | ~~0.053~~ | ~~0.0181~~ | ~~7.14~~ |
| ~~OREAS 182 ICP~~ | ~~0.706~~ | ~~0.0723~~ | ~~4.02~~ | ~~.~~ | ~~0.253~~ | ~~1.28~~ | ~~0.0049~~ | ~~29.62~~ | ~~<0.1~~ | ~~9.12~~ | ~~0.587~~ | ~~0.014~~ | ~~<0.02~~ | ~~<0.05~~ | ~~46.54~~ | ~~0.051~~ | ~~0.0189~~ | ~~.~~ |

## RM LEAD BASILICATE

analysis listed in mass % 25 or 100 g units

| Number | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | PbO | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|
| CERAM AN28 | 2.46 | 0.05 | 0.018 | 0.05 | <0.01 | 0.05 | 64.33 | 32.76 | <0.01 | 0.15 |

## CRM LEAD ORE TAILINGS WITH EXTENSIVE ANALYSIS

analysis listed mass % * BCS 362 lists AQUA REGIA results where indicated GBW: 50 g units BCS: 100 g units

| Number | $Al_2O_3$ | CaO | Cu | F | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Mn_3O_4$ | $Na_2O$ | Pb | PbO | S | $SiO_2$ | SrO | $TiO_2$ | Zn | ZnO | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07235 | 12.88 | 19.51 | 0.20 | 0.27 | 4.37 | 1.42 | 1.62 | 1.40 | . | 1.61 | 4.17 | . | 0.86 | 43.63 | . | 0.53 | 0.062 | . | . |
| BCS 362 * | 0.667 | 44.21 | 0.0056* | . | 0.483 | 0.14 | 0.068 | . | 0.829 | 0.084 | 2.30* | 2.63 | 1.48 | 9.03 | 0.034 | 0.047 | 2.03* | 2.59 | 32.81 |

continued analysis listed in mg/kg

| Number | Ag | As | Bi | Cd | Ce | Cr | Cs | Dy | Eu | Er | Ga | Gd | Ge | Ho | In | La | Li | Lu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07235 | 14.7 | 85.1 | 15.6 | 3.2 | 78.3 | (29) | (6) | 3.0 | 1.2 | 1.5 | 16.7 | 3.7 | 0.90 | 0.61 | 0.12 | 40.5 | (19) | 0.24 |
| BCS 362 * | . | 30* | . | 200* | . | 11* | . | . | . | . | . | . | . | . | . | . | . | . |

| Number | Mo | Nd | Ni | Pr | Rb | Sb | Sc | Se | Sm | Sn | Tb | Te | Th | Tl | Tm | W | Y | Yb | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07235 | 1.6 | 28.2 | 27.7 | 8.1 | (55) | 39.3 | 7.5 | 1.7 | 5.1 | 3.0 | 0.58 | 3.9 | 10.2 | 0.43 | 0.23 | 17.6 | 15.4 | 1.5 | . |
| BCS 362 * | . | . | 12* | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 8.14* |

## CRM LEAD ORE analysis listed in mass %

| Number | Pb | Ag | As | Ba | Co | Cu | Fe | Ni | S | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KZ 6586-93 | 3.5 | 0.0019 | . | 0.38 | . | 0.013 | 2.03 | . | 0.55 | 0.045 | 0.019 | 100 g |
| GBM920-1 | 3.1136 | 0.01575 | 0.0491 | . | 0.0327 | 0.3431 | . | 0.0010 | . | 0.3642 | . | 10 or 250 g |
| KZ 5177-90 | 1.84 | 0.00181 | . | 10.3 | . | . | . | . | 2.96 | . | . | 100 g last |

## CRM LEAD ORE analysis listed in mass % 25 g units

| Number | Pb | Ag | $Al_2O_3$ | As | Bi | CaO | Cd | Cu | Fe | MgO | Mn | S | Sb | $SiO_2$ | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28180 | 73.42 | 0.0250 | 0.54 | 0.0013 | 0.0051 | 0.30 | 0.022 | 0.058 | 1.70 | 0.042 | 0.570 | 14.22 | 0.0050 | 1.81 | . |
| NCS DC28179 | 57.44 | 0.0240 | 1.13 | 0.019 | 0.026 | 4.86 | 0.019 | 0.290 | 3.08 | 0.374 | 0.427 | 15.71 | 0.0061 | 3.52 | . |
| NCS DC28178 | 42.84 | 0.0933 | 2.01 | 0.816 | 0.0046 | 1.73 | 0.005 | 0.350 | 15.38 | 0.412 | 0.345 | 3.94 | 0.159 | 6.55 | . |
| NCS DC28116 | 15.09 | 0.022 | 2.56 | 0.068 | 0.085 | 17.16 | 0.0097 | 0.85 | 6.78 | 1.28 | 0.029 | 19.26 | 0.0084 | 7.92 | 1.44 |

## CRM LEAD ORE analysis listed in mass % except* which is mg/kg

| Number | Pb | S | Zn | Ag | Al | As | Au* | Ba* | C | Ca | Cd | Co* | Cr | Cu | Fe |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN CPB-3 | 58.02 | (17.03) | 5.96 | 0.2790 | 0.203 | (0.0391) | (0.119) | (60) | 1.03 | 0.059 | 0.065 | 13.6 | 0.0102 | 0.240 | 8.45 |

| Number | Hg* | K | La* | Mg | Mn | Na | Ni* | Sb | $SiO_2$ | Sn* | Sr* | Th* | Y* | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN CPB-3 | 40.8 | (0.09) | (2) | 0.106 | (0.421) | (0.01) | 16.8 | 0.58 | 2.62 | (6) | (3) | (0.4) | (2) | (0.15) | 100g |

## CRM LIMESTONE AND DOLOMITE

analysis listed in mass % 100 g

| Number | CaO | $CO_2$ | $Al_2O_3$ | BaO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | $MnO_2$ | $Na_2O$ | $SiO_2$ | $SO_3$ | SrO | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DK KSTM 1 | 46.57 | 36.11 | 3.24 | 0.0049 | 1.24 | 0.57 | 0.56 | 0.47 | 0.14 | 0.04 | 8.79 | 0.12 | 0.1394 | 0.16 | 38.07 |
| DK KSTM 2 | 55.04 | 43.20 | 0.19 | 0.002142 | 0.12 | 0.11 | 0.05 | 0.39 | 0.04 | 0.02 | 0.51 | 0.05 | 0.0197 | 0.01 | 43.57 |
| DK KSTM 3 | 55.17 | 43.33 | 0.13 | 0.001178 | 0.07 | 0.07 | 0.02 | 0.48 | 0.02 | 0.02 | 0.28 | 0.02 | 0.0214 | 0.01 | 43.44 |
| DK KSTM 4 | 30.23 | 45.53 | 0.14 | 0.002180 | 0.12 | 0.11 | 0.03 | 21.65 | 0.06 | 0.04 | 0.46 | 0.03 | 0.009052 | 0.01 | 47.25 |

continued analysis listed in mg/kg

| Number | As | Cd | Co | Cr | Cu | Hg | Ni | Pb | Sb | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DK KSTM 1 | 2.01 | 0.11 | 6.04 | 11.72 | 8.45 | 0.015 | 18.58 | 5.69 | 0.08 | 0.02 | 23.59 |
| DK KSTM 2 | 2.20 | 0.17 | 0.62 | 1.70 | 1.07 | 0.01 | 1.85 | 33.84 | 0.13 | 0.01 | 12.71 |
| DK KSTM 3 | 0.32 | 0.11 | 0.45 | 1.21 | 1.02 | 0.01 | 0.85 | 0.67 | 0.76 | 0.01 | 2.56 |
| DK KSTM 4 | 0.74 | 0.14 | 0.27 | 2.04 | 1.62 | 0.025 | 1.31 | 17.62 | 0.04 | 0.01 | 16.98 |

## CRM LIMESTONE WITH EXTENSIVE ANALYSIS

analysis listed in mass % CGL: 100 g JLs: 20 or 100 g NCS: 50 g

| Number | CaO | MgO | $CO_2$ | $SiO_2$ | LOI | $Al_2O_3$ | Org.C | FeO | T.$Fe_2O_3$ | $H_2O$- | $H_2O$+ | $K_2O$ | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | Ti% | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLs-1 | 55.09 | 0.606 | 43.58 | 0.120 | . | 0.0207 | $Fe_2O_3$: | 0.0178 | 0.0168 | 0.105 | (0.140) | 0.00297 | 0.00209 | 0.00194 | 0.0295 | S:0.0123 | . | (0.0020) |
| CGL 020 | 50.32 | 1.385 | . | 5.76 | 40.29 | 1.16 | . | . | 0.349 | $H_2O$: | (0.16) | 0.229 | 0.0231 | 0.228 | 0.0659 | . | . | 0.043 |
| NCS DC70301 | 47.89 | 6.76 | 44.39 | 0.55 | 43.92 | 0.17 | (0.03) | 0.15 | 0.193 | (0.20) | 0.37 | 0.043 | 0.009 | 0.022 | 0.008 | 0.017 | 0.0066 | 0.011 |
| NCS DC70302 | 41.95 | 11.62 | 44.89 | 0.72 | 44.75 | 0.22 | (0.03) | 0.16 | 0.205 | (0.20) | 0.31 | 0.052 | 0.009 | 0.029 | 0.014 | 0.013 | 0.0132 | 0.022 |
| NCS DC70308 | 38.08 | 14.96 | 45.62 | 1.17 | 44.61 | 0.18 | (0.04) | 0.05 | 0.448 | (0.17) | 0.42 | 0.026 | 0.027 | 0.030 | 0.009 | 0.041 | 0.0054 | 0.009 |
| NCS DC70305 | 30.93 | 20.14 | 45.58 | 1.15 | 45.73 | 0.29 | (0.07) | 0.07 | 0.17 | (0.07) | 0.39 | 0.16 | 0.012 | 0.036 | 0.035 | 0.33 | 0.0078 | 0.013 |

analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLs-1 | (0.0013) | (0.145) | . | 476 | . | . | . | 0.159 | 0.521 | . | 0.0825 | 3.37 | 0.0201 | 0.268 | 0.0283 | . | 0.0072 | 57.5 | . | (0.03) |
| CGL 020 | . | . | . | 51 | 0.58 | . | . | (0.04) | 6.08 | . | 1.1 | 5.3 | 2.01 | 1.3 | 0.528 | 0.298 | 0.143 | . | 1.48 | 0.611 |
| NCS DC70301 | 0.020 | 0.50 | (1.9) | 9.7 | 0.08 | 0.015 | (0.2) | 0.10 | 1.4 | 34 | 0.45 | 4.8 | 0.07 | 2.2 | 0.12 | 0.09 | 0.037 | 76 | 0.3 | 0.13 |
| NCS DC70302 | 0.021 | 0.29 | (2.2) | 11.6 | 0.12 | 0.020 | (0.3) | 0.09 | 1.9 | 34 | 0.5 | 5.6 | 0.09 | 2.2 | 0.15 | 0.12 | 0.052 | 91 | 0.33 | 0.16 |
| NCS DC70308 | 0.035 | 5.5 | (2.3) | 10.6 | 0.15 | 0.012 | 0.9 | 0.39 | 1.5 | 123 | 0.5 | 9.7 | 0.10 | 2.9 | 0.20 | 0.15 | 0.049 | 179 | 0.4 | 0.19 |
| NCS DC70305 | (0.016) | 0.96 | (6.4) | 0.52% | 0.08 | 0.025 | 6.1 | 0.02 | 2.5 | 343 | 0.52 | 3.4 | 0.13 | 2.8 | 0.17 | 0.10 | 0.14 | 459 | 0.31 | 0.22 |

| Number | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mn | Mo | Nb | Nd | Ni | P | Pb | Pr | Rb | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLs-1 | 0.126 | . | (0.0056) | . | . | . | 0.153 | (0.2) | 0.022 | . | . | (1.0) | (0.136) | 0.362 | . | (0.7) | (0.032) | (0.18) | (0.0166) |
| CGL 020 | . | 0.395 | . | 0.103 | . | . | 3.71 | 9.7 | 0.0412 | . | (0.13) | 0.8 | 3.32 | 5 | . | 2.9 | 0.85 | 11.5 | (0.25) |
| NCS DC70301 | 0.11 | 1.4 | 0.004 | 0.034 | (0.5) | (0.03) | 0.9 | 2.9 | 0.019 | 70 | 0.35 | 0.3 | 0.66 | 5.8 | 35 | 2.9 | 0.22 | 1.2 | 0.08 |
| NCS DC70302 | 0.12 | 2.1 | 0.015 | 0.034 | (0.3) | (0.02) | 1.2 | 3.1 | 0.022 | 70 | 0.26 | 0.46 | 0.86 | 4.3 | 62 | 3.9 | 0.24 | 1.6 | 0.09 |
| NCS DC70308 | 0.11 | 3.1 | 0.031 | 0.046 | (0.2) | (0.02) | 0.9 | 3.0 | 0.035 | 209 | 0.80 | 0.4 | 0.89 | 5.6 | 40 | 7.8 | 0.21 | 1.1 | 0.59 |
| NCS DC70305 | 0.12 | 0.13 | 0.006 | 0.034 | (0.2) | (0.02) | 1.3 | 3.1 | 0.015 | 93 | 0.19 | 0.4 | 1.10 | 2.9 | 155 | 2.9 | 0.28 | 2.6 | 0.06 |

| Number | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W% | Y | Yb | Zn | Zr% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLs-1 | 0.0307 | . | 0.135 | . | 295 | (0.014) | (0.0041) | . | 0.0287 | (0.003) | . | 1.75 | 3.59 | . | 0.223 | 0.0164 | 3.19 | (0.000419) |
| CGL 020 | 0.71 | . | 0.638 | 0.66 | 1018 | 0.093 | 0.092 | . | 0.71 | (0.083) | 0.0437 | 1.08 | 5.9 | 8ppm | 3.43 | 0.276 | 8 | (0.0016) |
| NCS DC70301 | 0.40 | 0.014 | 0.15 | (0.7) | 227 | (0.06) | 0.022 | 0.008 | 0.25 | 0.022 | 0.018 | 0.59 | 4.8 | 0.17 | 1.2 | 0.11 | 8.1 | 0.00537 |
| NCS DC70302 | 0.5 | 0.015 | 0.19 | (0.6) | 191 | 0.05 | 0.031 | 0.008 | 0.25 | 0.023 | 0.020 | 0.39 | 5.0 | 0.18 | 1.4 | 0.13 | 9.5 | 0.00768 |
| NCS DC70308 | 0.5 | 0.10 | 0.21 | (0.9) | 85 | 0.030 | 0.035 | 0.016 | 0.29 | 0.02 | 0.030 | 1.13 | 7.5 | 0.13 | 1.8 | 0.19 | 35.7 | 0.0113 |
| NCS DC70305 | 0.4 | 0.013 | 0.26 | (0.7) | 158 | 0.06 | 0.032 | 0.008 | 0.45 | 0.04 | 0.017 | 0.70 | 5.1 | 0.17 | 1.1 | 0.10 | 3.6 | 0.00049 |

## CRM LIMESTONE

| Number | Al | Ca | Fe | Mg | Mn | P | S | Si | Ti | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| IRSID 702-1 | 0.21 | 21.48 | 0.440 | 12.37 | 0.098 | 0.024 | 0.027 | 1.04 | 0.013 | 100 g |

## CRM LIMESTONE AND DOLOMITE

analysis listed in mass % FLX: RM, 30g NCS: CRM, 50g

| Number | CaO | MgO | $SiO_2$ | $Al_2O_3$ | $Fe_2O_3$ | $K_2O$ | $Mn_2O_3$ | MnO | $Na_2O$ | P | S | $SO_3$ | SrO | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLX 136 | 55.06 | 0.377 | 0.548 | 0.181 | 0.126 | 0.051 | 0.038 | . | . | . | . | 0.033 | 0.022 | . | . |
| NCS DC28246 | 54.92 | 0.37 | 0.47 | 0.203 | 0.107 | . | . | 0.0081 | . | 0.0017 | 0.010 | . | 0.017 | 0.0092 | 43.54 |
| NCS DC28160 | 54.20 | 0.82 | 0.960 | 0.328 | 0.146 | 0.084 | . | 0.0049 | 0.006 | 0.0019 | 0.019 | . | 0.018 | 0.016 | 43.27 |
| NCS DC28157 | 53.79 | 1.17 | 1.32 | 0.225 | 0.151 | 0.066 | . | 0.0037 | 0.0058 | 0.0027 | 0.020 | . | 0.018 | 0.014 | 43.22 |
| NCS DC28161 | 53.76 | 1.50 | 0.835 | 0.242 | 0.143 | 0.048 | . | 0.0058 | 0.006 | 0.0012 | 0.018 | . | 0.017 | 0.011 | 43.37 |
| NCS DC28245 | 53.40 | 1.90 | 0.37 | 0.17 | 0.125 | . | . | 0.0092 | . | 0.0015 | 0.014 | . | 0.024 | 0.0085 | 43.93 |
| NCS DC28159 | 51.95 | 1.23 | 2.36 | 0.811 | 0.296 | 0.165 | . | 0.0077 | 0.009 | 0.0017 | 0.016 | . | 0.020 | 0.036 | 42.39 |
| NCS DC28244 | 51.32 | 2.94 | 1.49 | 0.39 | 0.171 | . | . | 0.0026 | . | 0.0022 | 0.0082 | . | 0.018 | 0.018 | 43.47 |
| NCS DC28156 | 51.22 | 2.43 | 3.32 | 0.340 | 0.181 | 0.094 | . | 0.0042 | 0.0074 | 0.0019 | 0.030 | . | 0.021 | 0.020 | 42.26 |
| NCS DC28154 | 50.61 | 2.88 | 3.02 | 0.622 | 0.289 | 0.164 | . | 0.0054 | 0.026 | 0.0028 | 0.055 | . | 0.024 | 0.032 | 41.92 |
| NCS DC28171b | 49.64 | 4.13 | 2.23 | 0.462 | 0.187 | 0.272 | . | 0.0039 | 0.012 | 0.0032 | 0.035 | . | 0.019 | 0.022 | 43.18 |
| ~~NCS DC28170b~~ | ~~49.25~~ | ~~5.31~~ | ~~0.82~~ | ~~0.17~~ | ~~0.194~~ | ~~0.030~~ | ~~.~~ | ~~0.0069~~ | ~~0.007~~ | ~~0.0015~~ | ~~0.007~~ | ~~.~~ | ~~0.016~~ | ~~0.0080~~ | ~~43.96~~ |
| NCS DC28158 | 48.56 | 4.31 | 3.99 | 0.657 | 0.302 | 0.184 | . | 0.0055 | 0.028 | 0.0044 | 0.044 | . | 0.022 | 0.051 | 41.70 |
| NCS DC28247 | 47.82 | 6.13 | 0.70 | 0.222 | 0.201 | . | . | 0.0095 | . | 0.0066 | 0.014 | . | 0.018 | 0.013 | 44.46 |
| NCS DC28152 | 46.71 | 6.55 | 2.42 | 0.374 | 0.25 | 0.050 | . | 0.0046 | 0.011 | 0.0017 | 0.042 | . | 0.016 | 0.023 | 43.22 |
| NCS DC28155 | 46.09 | 5.98 | 4.60 | 0.283 | 0.187 | 0.038 | . | 0.0046 | 0.010 | 0.0016 | 0.033 | . | 0.020 | 0.015 | 42.55 |
| NCS DC28248 | 45.88 | 7.68 | 0.76 | 0.240 | 0.229 | . | . | 0.010 | . | 0.0078 | 0.016 | . | 0.018 | 0.014 | 44.51 |
| ~~NCS DC28175b~~ | ~~41.91~~ | ~~11.15~~ | ~~0.76~~ | ~~0.272~~ | ~~0.316~~ | ~~0.041~~ | ~~.~~ | ~~0.013~~ | ~~0.003~~ | ~~0.0023~~ | ~~0.002~~ | ~~.~~ | ~~0.0066~~ | ~~0.011~~ | ~~44.86~~ |
| NCS DC28153 | 41.81 | 10.37 | 2.35 | 0.543 | 0.417 | 0.074 | . | 0.0070 | 0.011 | 0.0032 | 0.050 | . | 0.014 | 0.031 | 43.81 |
| NCS DC28163 | 30.22 | 20.85 | 1.87 | 0.205 | 0.244 | 0.018 | . | 0.015 | 0.012 | 0.0015 | 0.038 | . | 0.013 | 0.0079 | 45.31 |
| NCS DC28164 | 30.15 | 20.91 | 2.16 | 0.250 | 0.248 | 0.027 | . | 0.016 | 0.011 | 0.0013 | 0.039 | . | 0.013 | 0.012 | 45.04 |
| NCS DC28165 | 29.50 | 20.43 | 5.22 | 0.706 | 0.357 | 0.033 | . | 0.018 | 0.023 | 0.0020 | 0.056 | . | 0.016 | 0.021 | 43.07 |
| NCS DC28162 | 28.73 | 19.76 | 8.42 | 1.20 | 0.475 | 0.039 | . | 0.020 | 0.033 | 0.0028 | 0.072 | . | 0.019 | 0.036 | 40.56 |
| Number | CaO | MgO | $SiO_2$ | $Al_2O_3$ | $Fe_2O_3$ | $K_2O$ | $Mn_2O_3$ | MnO | $Na_2O$ | P | S | $SO_3$ | SrO | $TiO_2$ | LOI |

## LIMESTONE AND DOLOMITE

analysis listed in mass % GUW, UL: 50 g GBW, NCS: 70 g others: 100 g

| Number | CaO | $Al_2O_3$ | $CO_2$ | FeO | $Fe_2O_3$ | T.$Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1d~~ | ~~52.85~~ | ~~0.526~~ | ~~.~~ | ~~.~~ | ~~0.3191~~ | ~~.~~ | ~~.~~ | ~~0.1358~~ | ~~0.301~~ | ~~.~~ | ~~0.0109~~ | ~~0.0413~~ | ~~4.080~~ | ~~0.0306~~ | ~~41.57~~ |
| UL CCH1 | 52.05 | 0.32 | . | . | . | 0.18 | . | 0.08 | 2.71 | 0.01 | 0.05 | 0.05 | 0.95 | 0.02 | 43.20 |
| NCS DC73375 | 51.1 | 0.68 | 39.8 | (0.06) | . | 0.21 | (0.4) | 0.15 | 0.71 | . | 0.03 | . | 6.65 | . | 40.2 |
| GUW KH | 47.8 | 2.39 | 37.6 | 0.33 | 0.92 | . | . | 0.41 | 0.74 | 0.088 | . | 0.121 | 8.60 | (0.130) | . |
| GUW KH2 | 47.64 | 2.365 | 37.51 | (0.31) | 0.855 | . | (1.26) | 0.437 | 0.656 | 0.0848 | 0.106 | 0.117 | 8.66 | 0.130 | . |
| GUW KH3 | 47.6 | 2.40 | 37.6 | 0.32 | 0.87 | . | (1.4) | 0.43 | 0.65 | 0.080 | 0.10 | 0.117 | 8.59 | 0.130 | 38.6 |
| VS 3193-85 | 38.5 | 1.87 | . | 1.89 | . | 2.48 | . | 0.49 | 6.04 | 0.28 | 0.48 | 0.027 | 12.35 | 0.09 | . |
| VS 3193-89 | 38.46 | 1.89 | . | 1.8 | . | 2.43 | . | 0.49 | 5.97 | 0.28 | 0.46 | 0.030 | 12.40 | 0.093 | . |
| GBW 07108 | 35.67 | 5.03 | 32.4 | 1.64 | . | 2.52 | +(2.12) | 0.78 | 5.19 | . | (0.08) | . | 15.60 | . | 34.1 |
| JDo-1 | 33.96 | 0.0174 | 46.50 | (0.071) | 0.0222 | 0.0208 | +0.395 -0.145 | 0.00232 | 18.47 | 0.00657 | 0.0129 | 0.0343 | 0.216 | . | . |
| VS 813-89 | 29.48 | 0.43 | 45.6 | 0.36 | 0.47 | . | 0.4 | 0.35 | 20.75 | 0.050 | 0.07 | 0.011 | 2.69 | 0.025 | . |
| VS 3192-89 | 21.56 | 5.48 | . | 1.8 | . | 3.15 | . | 2.75 | 12.89 | 0.30 | 1.38 | 0.060 | 19.92 | 0.28 | . |

analysis listed in mg/kg except % which is mass % and * which is ng/g

| Number | Ag | As | Au* | B | Ba | Be | Bi | Br | Carbon% | Cd | Ce | Cl | Co | Cr | Cs | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1d~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~BaO: 33~~ | | ~~(0.1)~~ | ~~.~~ | ~~.~~ | ~~11.50~~ | ~~(0.3)~~ | ~~(4)~~ | ~~(130)~~ | ~~.~~ | ~~.~~ | ~~(0.4)~~ | ~~.~~ |
| UL CCH1 | (<1) | (1.3) | . | (10) | 26 | (<4) | (<5) | . | . | . | 3.7 | (370) | 0.23 | (5.4) | (0.13) | (<10) |
| NCS DC73375 | (0.025) | 0.66 | . | (12) | 9 | 0.14 | 0.032 | (0.3) | (0.15 Org) | 0.016 | 4.6 | (24) | 0.8 | 3.4 | (0.10) | 2.2 |
| GUW KH | . | . | . | . | 50 | . | . | . | . | . | . | . | 5.3 | 15 | 1.4 | 10 |
| GUW KH2 | . | . | . | . | 46.3 | . | . | . | . | . | 18.1 | . | (10) | 14.2 | 12.2 | 8 |
| GUW KH3 | . | . | . | . | . | . | . | . | (0.14 Org) | . | . | . | . | . | . | . |
| VS 3193-85 | . | . | . | (10) | 60 | (1) | . | . | . | . | 18 | . | 2.2 | 13 | (0.7) | 4 |
| VS 3193-89 | . | . | . | . | 50 | . | . | . | . | . | 16 | . | 2.3 | 9 | . | 4 |
| GBW 07108 | 0.043 | 4.7 | (0.94) | 16 | 120 | 0.8 | 0.16 | . | 9.0 tot (0.11 org) | 0.07 | 25 | 78 | 9 | 32 | 3.2 | 23 |
| JDo-1 | (0.0019) | (0.114) | trace | . | 6.14 | . | . | (0.79) | (12.760) | 0.644 | 2.49 | . | 0.168 | 7.93 | . | 1.41 |
| VS 813-89 | . | . | . | 5 | 30 | 1.3 | . | . | . | . | . | . | 3.0 | 6 | . | 8 |
| VS 3192-89 | . | . | . | . | 400 | . | . | . | . | . | 27 | . | 12 | 30 | . | 29 |

| Number | Dy | Er | Eu | F | Ga | Gd | Ge | Hf | Hg | Ho | I | In | La | Li | $Li_2O$ | Lu | Mn | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1d~~ | ~~(0.6)~~ | ~~(0.4)~~ | ~~(0.1)~~ | ~~(160)~~ | ~~(1)~~ | ~~(0.5)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.1)~~ | ~~.~~ | ~~.~~ | ~~(4)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~209~~ | ~~.~~ |
| UL CCH1 | (0.27) | . | 0.17 | (367) | (<4) | (0.38) | (<10) | 0.11 | . | (0.4) | . | (<5) | 5.0 | 0.03 | . | . | . | (<5) |
| NCS DC73375 | 0.28 | (0.17) | 0.082 | 249 | 0.87 | 0.36 | 0.14 | 0.22 | 0.005 | (0.045) | (0.1) | (0.02) | 2.3 | 4.8 | . | 0.023 | 28 | 0.18 |
| GUW KH | . | . | 0.5 | 570 | . | . | . | 0.78 | . | . | . | . | . | 8.6 | . | 0.12 | . | . |
| GUW KH2 | . | . | 0.47 | 610 | . | . | . | . | . | . | . | . | . | (7) | . | 0.127 | . | . |
| GUW KH3 | . | . | . | (610) | . | . | . | . | . | . | . | . | . | . | (21) | . | . | . |
| VS 3193-85 | . | . | . | . | . | other impurities: 37.46% | | | . | . | . | . | (7) | . | . | (0.1) | . | . |
| VS 3193-89 | . | . | . | . | . | . | . | . | . | . | . | . | 8 | . | . | . | . | . |
| GBW 07108 | 1.6 | 1.0 | 0.51 | 406 | 7.1 | 1.9 | 0.67 | 1.8 | 0.016 | 0.33 | 0.23 | (0.04) | 15 | 20 | . | 0.14 | 434 | 0.38 |
| JDo-1 | 0.814 | . | 0.176 | 246 | . | (1.3) | . | (0.0897) | (0.0095) | (0.42) | . | . | 7.93 | (0.4) | . | 0.0494 | . | (0.78) |
| VS 813-89 | . | . | . | 200 | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| VS 3192-89 | . | . | . | . | . | . | . | . | . | . | . | . | 13 | 40 | . | . | . | 0.08 |

| Number | Nb | Nd | Ni | P | Pd | Pb | Pr | Pt | Ra | Rb | S | $SO_3$% | Sb | Sc | Se | Sm | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1d~~ | ~~(0.7)~~ | ~~(3)~~ | ~~(4)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.6)~~ | ~~.~~ | ~~.~~ | ~~(6)~~ | ~~1028~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.5)~~ | ~~(1)~~ |
| UL CCH1 | . | 4.2 | 11 | . | . | 6 | . | . | . | (2.6) | 1283 | . | (0.25) | 0.45 | . | 0.77 | (<5) |
| NCS DC73375 | 0.8 | 1.96 | (4) | 57 | N:(68) | 5 | 0.60 | . | . | 4.0 | 36 | . | 0.072 | (0.7) | 0.021 | 0.40 | (0.5) |
| GUW KH | . | . | 20 | . | . | . | . | . | . | 25 | . | . | . | 3 | . | 2.2 | . |
| GUW KH2 | . | . | 20.3 | . | . | (6) | . | . | . | 22 | . | . | . | 2.83 | . | . | . |
| GUW KH3 | . | . | . | . | . | . | . | . | . | . | 900 | (0.2) | . | . | . | . | . |
| VS 3193-85 | (8) | . | 7 | . | . | 16 | . | . | . | 15 | . | . | . | (2) | . | . | . |
| VS 3193-89 | 7 | . | 5 | . | . | 10 | . | . | . | 15 | . | . | . | 2.2 | . | . | . |
| GBW 07108 | 6.6 | 12.0 | 18 | 226 | . | 18 | 3.4 | . | . | 32 | (370) | . | 0.43 | 6.0 | 0.09 | 2.4 | (0.98) |
| JDo-1 | (0.4) | 5.25 | 2.90 | . | trace | (0.95) | 0.956 | trace | . | (1.75) | (90.5) | . | (0.036) | 0.136 | (0.0468) | 0.788) | . |
| VS 813-89 | . | . | 5 | . | . | 8 | . | . | 2e-10 | 5 | 200 | . | . | . | . | . | . |
| VS 3192-89 | 37 | . | 18 | . | . | 13 | . | . | . | 57 | . | . | . | 8 | . | . | 1.7 |

| Number | Sr | SrO | Ta | Tb | Te | Th | Ti% | Tl | Tm | U | V | W | Y | Yb | Zn | ZnO | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1d~~ | ~~.~~ | ~~303~~ | ~~.~~ | ~~(0.09)~~ | ~~.~~ | ~~(0.5)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(1)~~ | ~~(10)~~ | ~~.~~ | ~~(5)~~ | ~~(0.3)~~ | ~~.~~ | ~~22~~ | ~~.~~ |
| UL CCH1 | 267 | . | (0.03) | 0.11 | . | 0.30 | . | . | . | 3.9 | 27 | . | (7) | 0.24 | 29 | . | (35) |
| NCS DC73375 | 107 | . | (0.05) | 0.054 | . | 0.86 | 0.230 | (0.03) | (0.024) | 0.24 | 5.4 | 0.13 | 1.9 | 0.15 | 7 | . | 11 |
| GUW KH | 545 | . | 0.19 | . | . | 2.6 | . | . | . | . | 24 | . | . | 0.86 | 22 | . | 35 |
| GUW KH2 | 532 | . | . | . | . | 2.08 | . | . | . | (8) | . | . | . | . | 22.9 | . | . |
| GUW KH3 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| VS 3193-85 | 500 | . | . | . | . | (2) | . | . | . | (1) | 24 | . | (9) | (1) | 25 | . | 26 |
| VS 3193-89 | 440 | . | . | . | . | 1.8 | . | . | . | 1.0 | . | . | . | 0.9 | 30 | . | 27 |
| GBW 07108 | 913 | . | 0.42 | 0.35 | (0.024) | 4.1 | 0.1960 | 0.33 | 0.17 | 1.9 | 36 | 0.67 | 9.1 | 0.90 | 52 | . | 62 |
| JDo-1 | 116 | . | (0.009) | 0.116 | . | 0.0429 | . | (0.003) | (0.059) | 0.858 | 3.14 | . | 10.3 | 0.323 | 35.4 | . | 6.21 |
| VS 813-89 | 90 | . | . | . | . | 1.0 | . | . | . | 1.5 | 25 | . | . | . | 30 | . | 30 |
| VS 3192-89 | 44 | . | . | . | . | 15 | . | . | . | 0.8 | 22 | . | . | 2.5 | 30 | . | 70 |

## LIMESTONE AND DOLOMITE

# = class, where 1 = CRM and 2 = RM

f.$SiO_2$ = free $SiO_2$

| # | Number | CaO | $Al_2O_3$ | Fe | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | P | $P_2O_5$ | S | $SO_3$ | $SiO_2$ | f.$SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~1~~ | ~~NCS DC16006~~ | ~~65.20~~ | ~~0.885~~ | ~~.~~ | ~~0.46~~ | ~~0.19~~ | ~~4.55~~ | ~~0.013~~ | ~~0.021~~ | ~~0.0054~~ | ~~.~~ | ~~0.101~~ | ~~.~~ | ~~3.72~~ | ~~.~~ | ~~.~~ | ~~25.06~~ |
| ~~1~~ | ~~VS W10/3~~ | ~~55.8~~ | ~~0.012~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.32~~ | ~~.~~ | ~~.~~ | ~~0.0035~~ | ~~.~~ | ~~0.0053~~ | ~~.~~ | ~~0.050~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| 1 | ECRM 752-1 | 55.4 | 0.12 | . | 0.045 | 0.02 | 0.15 | 0.01 | (<0.03) | . | (0.01) | 0.007 | . | 0.70 | . | 0.009 | 43.4 |
| 1 | BCS 513 | 55.59 | 0.108 | . | 0.0275 | 0.0150 | 0.182 | 0.0095 | (<0.3) | . | (0.005) | 0.0097 | . | 0.228 | . | (0.004) | 43.61 |
| 1 | DK 1a | 55.4 | 0.05 | . | 0.04 | 0.01 | 0.39 | 0.01 | 0.01 | . | . | . | 0.02 | 0.64 | . | <0.01 | 43.3 |
| 1 | NCS DC14014b | 55.12 | 0.079 | . | 0.341 | 0.0030 | 0.73 | 0.0058 | 0.0075 | 0.0013 | . | 0.010 | . | 0.073 | . | Ti:0.0010 | 43.53 |
| ~~1~~ | ~~NM 711~~ | ~~55.10~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.50~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.52~~ | ~~.~~ | ~~.~~ | ~~43.48~~ |
| 2 | DH X3513 | 55.06 | 0.097 | . | 0.082 | 0.029 | 0.466 | 0.017 | 0.003 | . | 0.007 | . | 0.012 | 0.289 | . | 0.006 | . |
| 1 | NCS DC60107b | 54.71 | 0.24 | . | 0.098 | 0.049 | 0.66 | 0.0098 | 0.0063 | . | 0.0055 | . | 0.024 | 0.43 | 0.16 | 0.010 | 43.30 |
| ~~1~~ | ~~VB K1~~ | ~~54.58~~ | ~~0.11~~ | ~~.~~ | ~~0.097~~ | ~~(0.028)~~ | ~~0.72~~ | ~~0.0095~~ | ~~0.020~~ | ~~.~~ | ~~(0.016)~~ | ~~.~~ | ~~(0.051)~~ | ~~0.44~~ | ~~.~~ | ~~(0.011)~~ | ~~43.70~~ |
| 1 | NCS DC14017b | 54.11 | 0.61 | . | 0.319 | 0.0038 | 0.79 | 0.0074 | 0.021 | 0.0017 | . | 0.182 | . | 0.85 | . | Ti:0.0021 | 42.79 |
| ~~1~~ | ~~GBW 03105a~~ | ~~54.03~~ | ~~0.24~~ | ~~.~~ | ~~0.11~~ | ~~0.084~~ | ~~0.81~~ | ~~0.0067~~ | ~~0.017~~ | ~~.~~ | ~~0.0081~~ | ~~.~~ | ~~0.018~~ | ~~1.09~~ | ~~0.67~~ | ~~0.010~~ | ~~43.12~~ |
| 1 | CGL 028 | 53.73 | (0.12) | . | (0.049) | (0.048) | 1.39 | (0.021) | (0.15) | . | (0.036) | . | . | 1.52 | . | . | (42.51) |
| ~~1~~ | ~~NM 172~~ | ~~52.78~~ | ~~0.27~~ | ~~.~~ | ~~0.27~~ | ~~0.10~~ | ~~1.58~~ | ~~0.013~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0089~~ | ~~.~~ | ~~1.92~~ | ~~.~~ | ~~0.011~~ | ~~42.57~~ |
| 1 | NCS DC28205 | 52.42 | 0.39 | . | 0.197 | . | 1.92 | 0.0054 | . | 0.0019 | . | 0.012 | . | 2.17 | . | 0.0093 | 42.53 |
| 1 | NCS DC60108a | 51.61 | 0.33 | . | 0.17 | 0.17 | 2.25 | 0.0089 | 0.017 | . | 0.0061 | . | 0.016 | 2.09 | 1.38 | 0.015 | 42.84 |
| 1 | NCS DC14015b | 51.41 | 0.74 | . | 0.838 | 0.0062 | 2.31 | 0.013 | 0.0073 | 0.0021 | . | 0.273 | . | 2.06 | . | Ti:0.0071 | 41.79 |
| 1 | NCS DC28204 | 50.72 | 0.18 | . | 0.208 | . | 3.96 | 0.012 | . | 0.0076 | . | 0.016 | . | 0.83 | . | 0.0060 | 43.70 |
| 1 | NCS DC60109a | 50.09 | 0.94 | . | 0.58 | (0.42) | 1.79 | (0.014) | (0.027) | . | 0.033 | . | (0.054) | 4.05 | (2.02) | (0.052) | 41.53 |
| ~~2~~ | ~~DH X3515~~ | ~~48.91~~ | ~~0.787~~ | ~~.~~ | ~~1.293~~ | ~~0.187~~ | ~~0.379~~ | ~~0.028~~ | ~~0.032~~ | ~~.~~ | ~~0.036~~ | ~~.~~ | ~~0.055~~ | ~~8.75~~ | ~~.~~ | ~~0.048~~ | ~~.~~ |
| 1 | NCS DC62002d | 48.16 | 1.67 | . | 1.17 | 0.61 | 0.93 | . | 0.09 | . | . | . | 0.06 | 7.88 | . | 0.12 | 38.96 |
| 1 | NCS DC60110a | 47.07 | 0.60 | . | 0.38 | (0.20) | 5.81 | (0.012) | (0.016) | . | (0.037) | . | (0.032) | 2.25 | (1.21) | (0.030) | 43.22 |
| ~~1~~ | ~~DK 1b~~ | ~~43.6~~ | ~~3.20~~ | ~~.~~ | ~~1.25~~ | ~~0.96~~ | ~~3.00~~ | ~~0.02~~ | ~~0.13~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.13~~ | ~~9.5~~ | ~~.~~ | ~~0.15~~ | ~~37.7~~ |
| ~~1~~ | ~~VB K2~~ | ~~43.19~~ | ~~3.93~~ | ~~.~~ | ~~1.39~~ | ~~0.82~~ | ~~0.65~~ | ~~0.025~~ | ~~0.064~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.22~~ | ~~13.38~~ | ~~.~~ | ~~(0.21)~~ | ~~35.61~~ |
| 1 | NCS DC14050 | 42.62 | 0.36 | . | 0.260 | 0.021 | 9.45 | 0.015 | 0.015 | 0.0033 | . | 0.039 | . | 7.97 | . | Ti:0.0096 | 38.80 |
| ~~1~~ | ~~IPT 122~~ | ~~32.0~~ | ~~1.24~~ | ~~.~~ | ~~0.65~~ | ~~0.43~~ | ~~17.5~~ | ~~0.042~~ | ~~0.019~~ | ~~.~~ | ~~0.048~~ | ~~.~~ | ~~.~~ | ~~4.3~~ | ~~.~~ | ~~0.06~~ | ~~43.3~~ |
| 1 | VS K4/4 | 31.2 | 0.47 | . | 0.56 | . | 20.1 | 0.034 | . | . | . | . | . | 0.96 | . | . | . |
| ~~1~~ | ~~SRM 88b *~~ | ~~29.95~~ | ~~0.336~~ | ~~.~~ | ~~0.277~~ | ~~0.1030~~ | ~~21.03~~ | ~~0.0160~~ | ~~0.0290~~ | ~~.~~ | ~~0.0044~~ | ~~.~~ | ~~.~~ | ~~1.13~~ | ~~.~~ | ~~(0.016)~~ | ~~(46.98)~~ |
| 1 | DK 2a ** | 29.2 | 0.91 | . | 1.01 | 0.37 | 19.5 | 0.06 | 0.04 | . | . | . | 0.06 | 4.3 | . | 0.07 | 44.3 |

continued

| Number | $CO_2$ | $Cl^-$ | Cr | $Cr_2O_3$ | Cu | Pb | SrO | Zn | Ins.Res | Units | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~NCS DC16006~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~15 g~~ | |
| ~~VS W10/3~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~75 g~~ | |
| ECRM 752-1 | . | . | . | . | . | . | 0.019 | . | . | 100 g | |
| BCS 513 | . | . | . | 0.0012 | . | 0.0009 | 0.0176 | 0.0014 | . | 100 g | |
| DK 1a | . | . | . | . | . | . | . | . | . | 60 g | |
| NCS DC14014b | . | . | . | . | . | . | Sr:0.025 | . | . | 50 g | |
| ~~NM 711~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| DH X3513 | 43.80 | . | . | . | . | . | 0.019 | . | . | 100 g | $-H_2O$ @ 900'C: 0.099 |
| NCS DC60107b | (43.28) | 0.014 | . | . | . | . | . | . | . | 50 g | |
| ~~VB K1~~ | ~~(43.54)~~ | ~~.~~ | ~~(0.0025)~~ | ~~.~~ | ~~(0.00055)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| NCS DC14017b | . | . | . | . | . | . | Sr:0.024 | . | . | 50 g | |
| ~~GBW 03105a~~ | ~~(43.12)~~ | ~~0.0028~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~50 g~~ | |
| CGL 028 | . | . | . | . | . | . | Sr:(0.1057) | . | . | 100 g | |
| ~~NM 172~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| NCS DC28205 | . | . | . | . | . | . | 0.023 | . | . | 50 or 100 g | |
| NCS DC60108a | (42.59) | 0.0066 | . | . | . | . | . | . | . | 50 g | |
| NCS DC14015b | . | . | . | . | . | . | Sr:0.023 | . | . | 50 g | |
| NCS DC28204 | . | . | . | . | . | . | 0.046 | . | . | 50 or 100 g | |
| NCS DC60109a | (41.32) | (0.0062) | . | . | . | . | . | . | . | 50 g | |
| ~~DH X3515~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.050~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| NCS DC62002d | . | . | . | . | . | . | . | . | . | 20 g | |
| NCS DC60110a | (43.02) | (0.0054) | . | . | . | . | . | . | . | 50 g | |
| ~~DK 1b~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~60 g~~ | |
| ~~VB K2~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| NCS DC14050 | . | . | . | . | . | . | Sr:0.017 | . | . | 50 g | |
| ~~IPT 122~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.018~~ | ~~.~~ | ~~.~~ | ~~80 g~~ | |
| VS K4/4 | . | . | . | . | . | . | . | . | 1.30 | 75 g | |
| ~~SRM 88b *~~ | ~~46.37~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0076~~ | ~~.~~ | ~~.~~ | ~~75 g~~ | ~~* SRM 88b lists Mn as MnO~~ |
| DK 2a ** | . | . | . | . | . | . | . | . | . | 60 g | ** DK 2a lists $Mn_3O_4$ as MnO |

## CRM SYNTHETIC LIMESTONE WITH TRACE ELEMENTS

Material base: $CaCO_3$ 85%, $MgCO_3$ 8%, $SiO_2$ 5.2%, $Al_2O_3$ 1.1%, $Fe_2O_3$ 0.3%, $Na_2SO_4$ 0.2%, $K_2SO_4$ 0.2%

70 g units analysis listed in mg/kg

| Number | Ag | As | B | Ba | Be | Bi | Cd | Ce | Co | Cr | Cu | Ga | La | Li | Mn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07712 | (0.030) | 2.2 | 2.2 | 24 | 0.22 | 0.23 | (0.023) | 2.8 | 2.3 | 2.3 | 2.2 | 2.8 | 2.6 | 3.2 | 37 |
| GBW 07713 | 0.060 | 5.2 | 5 | 54 | 0.52 | 0.53 | 0.053 | 5.8 | 5.3 | 5.3 | 5.2 | 5.8 | 5.6 | 6.2 | 67 |
| GBW 07714 | 0.11 | 10.2 | 10 | 104 | 1.0 | 1.0 | 0.10 | 11 | 10.3 | 10.3 | 10.2 | 10.8 | 10.6 | 11.2 | 117 |
| GBW 07715 | 0.21 | 20 | 20 | 204 | 2.0 | 2.0 | 0.20 | 21 | 20.3 | 20.3 | 20 | 20.8 | 20.6 | 21 | 217 |
| GBW 07717 | 1.0 | 100 | 100 | 1000 | 10 | 10 | 1.0 | 101 | 100 | 100 | 100 | 101 | 101 | 101 | 1020 |
| GBW 07718 | 2.0 | 200 | 200 | 2000 | 20 | 20 | 2.0 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 2020 |
| GBW 07719 | 5.0 | 500 | 500 | 5000 | 50 | 50 | 5.0 | 500 | . | . | 500 | . | . | 500 | 5000 |
| GBW 07720 | 10 | . | . | . | 100 | 100 | 10 | . | . | . | 1000 | . | . | . | 10000 |

continued

| Number | Mo | Nb | Ni | Pb | Sb | Sn | Sr | Ti | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07712 | 0.21 | 2.5 | 2.1 | 2.4 | 0.21 | 0.28 | 170 | 31 | 3.2 | 0.22 | 2.1 | 0.22 | 3.0 | 4.0 |
| GBW 07713 | 0.51 | 5.5 | 5.1 | 5.4 | 0.51 | 0.58 | 200 | 61 | 6.2 | 0.52 | 5.1 | 0.52 | 6.0 | 7.0 |
| GBW 07714 | 1.0 | 10.5 | 10 | 10.4 | 1.0 | 1.1 | 250 | 111 | 11.2 | 1.0 | 10 | 1.0 | 11 | 12 |
| GBW 07715 | 2.0 | 20.5 | 20 | 20.4 | 2.0 | 2.1 | 350 | 210 | 21 | 2.0 | 20 | 2.0 | 21 | 22 |
| GBW 07717 | 10 | 100 | 100 | 100 | 10 | 10 | 1150 | 1010 | 101 | 10 | 100 | 10 | 101 | 102 |
| GBW 07718 | 20 | 200 | 200 | 200 | 20 | 20 | 2200 | 2000 | 200 | 20 | 200 | 20 | 200 | 202 |
| GBW 07719 | 50 | . | 500 | 500 | 50 | 50 | 5200 | 5000 | 500 | 50 | . | 50 | 500 | 500 |
| GBW 07720 | 100 | . | . | 1000 | 100 | 100 | . | . | . | 100 | . | 100 | 1000 | . |

## CRM LITHIUM ORE WITH EXTENSIVE ANALYSIS

analysis listed in mass % **17025**

| Number | $Al_2O_3$ | Bi | CaO | $Fe_2O_3T$ | $K_2O$ | $Li_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Pb | S | $SiO_2$ | $TiO_2$ | Zn | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CGL 128** | 13.66 | 0.0185 | 0.746 | 0.663 | 6.28 | 0.578 | 0.033 | 0.603 | (0.603) | (0.029) | 0.0558 | (0.223) | 73.40 | (0.053) | 0.0594 | (2.14) | 100 g |

continued analysis listed in mg/kg

| Number | As | Ba | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Hf | Ho | In | La | Lu | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CGL 128** | 61.75 | 83.51 | 185 | (3.64) | (46.93) | (0.401) | (105) | (67.38) | 186 | (1.37) | (1.18) | (0.091) | (29.69) | (1.22) | (5.64) | (0.313) | (0.303) | (28.92) | (0.421) | (7.26) |

| Number | Nb | Nd | Ni | Pr | Rb | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | W | Y | Yb | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CGL 128** | (77.63) | (8.64) | (1.76) | (3.41) | (2135) | (20.50) | (9.62) | (2.26) | (11.43) | 24.54 | (9.74) | (0.208) | (1.12) | (24.20) | (14.65) | (0.240) | 45.28 | 107 | (12.33) | (2.19) | 69.94 |

## CRM LITHIUM ORE WITH EXTENSIVE ANALYSIS

analysis listed in mass % **17034** 40 g

| Number | Al | C | C.Graphitic | Ca | Cu | F | Fe | H2O- | K | Li | Mg | Mn | Na | Ni | P | S | Si | Ti | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AC18.10664** | 7.47 | 21.39 | (11.60) | 0.663 | 2.336 | 2.44 | 1.114 | (0.33) | 0.080 | 4.134 | 0.525 | 5.339 | 0.271 | 23.134 | 0.350 | 0.376 | 2.85 | 0.133 | 0.00486 | 0.248 |
| **AC18.10665** | 4.559 | 54.21 | (35.36) | 0.242 | 0.564 | 1.43 | 0.873 | (1.18) | 0.0398 | 1.816 | 0.1069 | 2.838 | 0.294 | 9.200 | 0.145 | 0.556 | 0.755 | 0.0282 | 0.0754 | 0.114 |

analysis listed in mg/kg

| Number | Ag | As | B | Ba | Be | Bi | Cd | Ce | Cl | Co | Cr | Cs | Dy | Er | Eu | Ga | Gd | Ge | Hf | Hg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AC18.10664** | (1.72) | (6.99) | (241) | 34.6 | (0.30) | (0.15) | (1.12) | 7.5 | 283 | 6.100 | 122 | (0.074) | 0.548 | (0.32) | (0.17) | 11.6 | 0.64 | (1.46) | (43.3) | (1.14) |
| **AC18.10665** | (2.69) | 15.9 | (148) | 15.1 | (0.14) | (0.92) | 2.37 | 1.66 | 240 | 2.968 | 22.4 | (0.30) | 0.174 | (0.11) | (0.050) | (5.96) | (0.20) | (0.55) | (19.4) | (0.23) |

| Number | Ho | In | La | Lu | Mo | Nb | Nd | Pb | Pr | Rb | Re | Sb | Sc | Se | Sm | Sn | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AC18.10664** | (0.10) | (0.17) | 45.7 | (0.049) | 2.94 | (2.86) | (5.16) | (6.14) | 1.38 | (2.69) | (0.015) | (10.4) | (2.74) | (3.79) | (0.54) | 66 | 38.2 |
| **AC18.10665** | (0.035) | 0.179 | 1.13 | (0.039) | 1.21 | (0.92) | (0.83) | (35.6) | 0.213 | (2.81) | (0.007) | (0.22) | (1.71) | (5.72) | (0.20) | 1.17 | 15.7 |

| Number | Ta | Tb | Th | Tl | U | V | W | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|
| **AC18.10664** | (0.24) | Tb:0.117 | (0.31) | (0.021) | (0.21) | 25.6 | (515) | 17.6 | (0.22) |
| **AC18.10665** | (0.073) | Te:(0.30) | (0.23) | (0.047) | (0.18) | 7.80 | 98 | 3.01 | (0.10) |

## CRM LITHIUM ORE

analysis listed in mass % 10 g units

| Number | Li | Ta | Al | Ca | Fe | K | Mg | Mn | Na | Nb | Si | $SiO_2$ | Sn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GTA-12 | 1.7412 | 0.0556 | 11.5 | 0.8 | 1.85 | 2.4 | 0.38 | 0.0770 | . | 0.0183 | 30.8 | . | 0.0325 | 1.05 |

## CRM LITHIUM ORE

analysis listed in mass % $RE_xO_y$: Rare Earth Oxide 50 or 70 g

| Number | $Li_2O$ | $Al_2O_3$ | BeO | CaO | $Cs_2O$ | F- | FeO | $T.Fe_2O_3$ | $H_2O$- | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $Rb_2O$ | $RE_xO_y$ | $SiO_2$ | $Ta_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~NCS DC86303~~ | ~~0.460~~ | ~~14.76~~ | ~~0.018~~ | ~~0.335~~ | ~~0.037~~ | ~~0.667~~ | ~~(0.062)~~ | ~~0.394~~ | ~~1.06~~ | ~~3.17~~ | ~~0.054~~ | ~~0.070~~ | ~~4.19~~ | ~~0.173~~ | ~~0.145~~ | ~~47.0~~ | ~~74.37~~ | ~~0.00494~~ | ~~0.018~~ | ~~1.48~~ |

continued analysis listed in mg/kg except % which is mass %

| Number | $CeO_2$ | $Dy_2O_3$ | $Er_2O_3$ | $Eu_2O_3$ | $Gd_2O_3$ | $Ho_2O_3$ | $La_2O_3$ | $Lu_2O_3$ | $Nb_2O_5$ | $Nd_2O_3$ | $Pr_6O_{11}$ | $Sc_2O_3$ | $Sm_2O_3$ | Sn | $Tb_4O_7$ | $Tm_2O_3$ | W | $Y_2O_3$ | $Yb_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~NCS DC86303~~ | ~~9.0~~ | ~~2.5~~ | ~~1.2~~ | ~~(0.14)~~ | ~~2.1~~ | ~~0.45~~ | ~~5.1~~ | ~~0.18~~ | ~~27.0~~ | ~~5.0~~ | ~~1.3~~ | ~~0.98~~ | ~~1.6~~ | ~~(36)~~ | ~~0.43~~ | ~~0.18~~ | ~~8.9~~ | ~~16.9~~ | ~~1.3~~ |

## CRM LITHIUM ORE

45 g units

| Number | $Li_2O$% |
|---|---|
| SRM 183 | 4.12 |

## CRM LUJAVRITE

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | CaO | FeO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $TiO_2$ | Ba | Be | Co | Cr | Cu | Ga | Ge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2124-81 | 56.13 | 16.96 | 1.25 | 1.14 | 5.52 | 6.23 | 0.74 | 0.254 | 9.26 | 0.92 | 0.080 | 0.00139 | 0.00063 | 0.00125 | 0.00111 | 0.0063 | 0.00013 |

continued

| Number | La | Li | Mo | Nb | Ni | Pb | Rb | Sn | Sr | V | Y | Yb | Zn | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2124-81 | 0.040 | 0.0037 | 0.00028 | 0.034 | 0.00078 | 0.0020 | 0.0250 | 0.0014 | 0.080 | 0.0086 | 0.0081 | 0.00057 | 0.012 | 40 g |

## CRM LOW BORON MAGNESITE

| Number | Al | B | Ca | Cr | Fe | K | Mg | Mn | Na | P | Si | Ti | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECRM 779-1 | 0.105 | 0.0116 | 1.691 | (0.0030) | 3.73 | (0.0020) | (54.57) | 0.503 | (0.0058) | 0.0267 | 0.182 | 0.0081 | 100 g |

## CRM MAGNESITE

analysis listed in mass % — 100 g units

| Number | MgO | $Al_2O_3$ | CaO | $Fe_2O_3$ | FeO | $K_2O$ | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 43 | 44.11 | (0.06) | 0.89 | 0.26 | (0.1) | (0.04) | (0.1) | (0.05) | (0.02) | 5.99 | (0.01) |

analysis listed in mg/kg

| Number | Ba | Ce | Co | Cr | Cu | Ni | Sr | Zn |
|---|---|---|---|---|---|---|---|---|
| SARM 43 | (25) | (20) | 4 | (195) | (15) | 252 | 8 | (10) |

## MAGNESITE

# = class, where 1 = CRM and 2 = RM  analysis listed in mass %  CERAM: 25 or 100g  NCS: 50g  NH: 75g  others: 100g

| # | Number | MgO | $Al_2O_3$ | $B_2O_3$ | CaO | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | MnO | $Mn_2O_3$ | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | SrO | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BCS 389/1 | 97.89 | 0.104 | . | 0.880 | . | 0.607 | . | 0.100 | . | . | 0.0295 | . | 0.274 | . | 0.0052 | . |
| 1 | BCS 319/1 | 95.38 | 0.109 | . | 3.00 | 0.0035 | 0.291 | . | 0.108 | . | . | . | . | 1.093 | . | 0.0070 | . |
| 2 | CERAM AN37 | 94.00 | . | 0.09 | 1.46 | 0.005 | 1.80 | <0.01 | . | 0.12 | <0.05 | 0.02 | . | 1.39 | . | 0.03 | . |
| 2 | CERAM AN36 | 93.30 | . | 0.09 | 0.94 | 0.004 | 4.66 | <0.01 | . | 0.11 | <0.05 | 0.008 | . | 0.48 | . | 0.01 | . |
| 1 | ECRM 778-1 | 81.02 | 0.56 | . | 1.23 | 0.15 | 0.96 | . | 0.014 | . | . | (0.009) | . | 1.05 | . | (0.013) | . |
| 1 | NCS DC28090 | 46.40 | 0.10 | . | 0.53 | . | 0.65 | 0.0050 | 0.016 | . | 0.017 | 0.013 | 0.0027 | 0.32 | 0.005 | 0.0060 | 51.58 |
| 1 | USZ 37-2003 | 45.80 | 0.04 | . | 1.69 | . | 0.05 | 0.011 | . | . | . | . | . | 0.25 | . | $CO_2$: 48.31 | 51.35 |
| 1 | UNS MK | 45.22 | 0.414 | . | 0.581 | . | . | 0.013 | 0.160 | . | 0.024 | 0.055 | . | 0.593 | . | 0.019 | . |
| 1 | NCS DC28089 | 43.45 | 1.14 | . | 1.52 | . | 1.74 | 0.037 | 0.095 | . | 0.018 | 0.036 | 0.015 | 4.13 | 0.0013 | 0.041 | 47.35 |
| 1 | NCS DC28089a | 43.44 | 1.46 | . | 1.26 | . | 1.66 | 0.044 | 0.083 | . | 0.020 | 0.037 | 0.015 | 4.95 | 0.0014 | 0.048 | 46.57 |
| 2 | CERAM AN43 | . | . | 0.005 | . | . | . | (0.06) | . | . | . | . | . | . | . | . | last |
| 2 | CERAM AN45 | . | . | 0.222 | . | . | . | . | . | . | . | . | . | . | . | . | last |

## RM MAGNESITE

typical analysis listed in mass % — 100 g units

| Number | MgO | $Al_2O_3$ | C tot. | $CO_2$ | CaO | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | $Mn_3O_4$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | $V_2O_5$ | ZnO | $ZrO_2$ | $-H_2O$ at 900°C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH 4208 | 47.83 | 41.66 | 0.353 | 0.580 | 2.06 | 0.040 | 1.49 | 0.037 | 0.070 | 0.077 | 0.007 | 5.09 | 0.066 | 0.001 | 0.006 | 0.091 | 0.894 |

## CRM MAGNETITE ORE

analysis listed in mass & — 250 g units

| Number | Fe | $Al_2O_3$ | CaO | $K_2O$ | MgO | Mn | $Na_2O$ | P | S | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~IMS PBS-59~~ | ~~32.82~~ | ~~0.56~~ | ~~1.23~~ | ~~0.429~~ | ~~2.16~~ | ~~0.064~~ | ~~0.644~~ | ~~0.069~~ | ~~(0.006)~~ | ~~46.45~~ | ~~(0.028)~~ | ~~1.34~~ |
| IMS PBS-71 | 30.70 | 1.46 | 0.496 | 0.660 | 2.23 | 0.118 | 0.153 | 0.103 | 0.131 | 47.22 | 0.073 | 3.26 |
| ~~IMS PBS-70~~ | ~~30.46~~ | ~~1.49~~ | ~~0.492~~ | ~~0.675~~ | ~~2.26~~ | ~~0.117~~ | ~~0.149~~ | ~~0.102~~ | ~~0.133~~ | ~~47.54~~ | ~~0.073~~ | ~~3.28~~ |

| Number | As | Ba | Cl | Co | Cr | Cu | Ni | Pb | Sn | Sr | V | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~IMS PBS-59~~ | ~~.~~ | ~~(0.005)~~ | ~~(0.015)~~ | ~~(0.001)~~ | ~~(0.011)~~ | ~~(0.002)~~ | ~~(0.002)~~ | ~~(0.001)~~ | ~~(0.002)~~ | ~~(0.003)~~ | ~~.~~ | ~~(0.002)~~ | ~~(0.003)~~ |
| IMS PBS-71 | (0.002) | (0.006) | (0.043) | (0.002) | (0.008) | (0.001) | (0.002) | (0.002) | (0.002) | (0.003) | (0.002) | (0.002) | (0.004) |
| ~~IMS PBS-70~~ | ~~(0.001)~~ | ~~(0.006)~~ | ~~(0.043)~~ | ~~(0.001)~~ | ~~(0.007)~~ | ~~(0.002)~~ | ~~(0.002)~~ | ~~(0.003)~~ | ~~(0.001)~~ | ~~(0.003)~~ | ~~(0.002)~~ | ~~(0.002)~~ | ~~(0.004)~~ |

**CRM** **MANGANESE ORE** # = class, where 1 = CRM and 2 = RM analysis in mass % T = Total

| # | Number | Mn | $MnO_2$ | $Mn(CO_3)$ | $Al_2O_3$ | As | $As_2O_3$ | Ba | BaO | $CO_2$ | CaO | Fe | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IGS 29 | MnO: 93.38 | . | . | . | . | . | 0.59 | . | . | . | . | . | . | . | . | . | . |
| 1 | VS R13/3 | 58.88 | 90.4 | . | . | . | . | . | . | . | . | . | . | . | . | . | 2.01 | . |
| 1 | NCS DC26703 | 58.80 | (62.07) | . | 0.74 | . | . | . | . | C:0.034 | 0.37 | 1.45 | . | . | 0.17 | . | 5.63 | Ti:0.025 |
| 1 | VS P13/1 | 58.8 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 2.00 | . |
| 1 | SRM 25d | 51.78 | . | . | (5.33) | . | . | . | (0.21) | . | (0.052) | . | (3.91) | (0.928) | . | . | 2.54 | (0.136) |
| 1 | SARM 16 | 49.17 | . | . | (0.3) | . | . | . | 0.60 | . | 4.70 | 11.48 | . | 0.02 | 0.76 | (0.03) | 5.04 | . |
| 1 | NCS DC35015 | 49.00 | 68.28 | . | . | 0.015 | . | . | . | . | . | 3.97 | . | . | . | . | . | . |
| 1 | JSS 861-2 | 48.7 | . | . | Al: 1.57 | . | . | . | . | . | Ca: 0.063 | (5.7) | . | . | . | . | Si: 2.62 | . |
| 1 | NCS DC26702 | 48.53 | (72.64) | . | 3.28 | . | . | . | . | C:0.085 | 0.37 | 4.93 | . | . | 0.25 | . | 5.56 | Ti:0.102 |
| 1 | BAM 633-1 | 47.85 | . | . | 1.64 | . | (0.004) | . | 1.13 | . | 2.02 | 1.64 | . | . | 0.58 | . | 10.39 | 0.079 |
| 1 | AMIS 0403 | 46.82 | MnO: 60.42 | | 0.37 | . | . | . | . | Ca: 3.56 | 5.12 | 12.43 | 18.25 | (0.023) | 0.66 | (0.18) | 5.25 | (0.02) |
| 2 | RH01 | 46.8 | 51.3 | . | 1.50 | . | . | . | (0.3) | . | 1.77 | 1.63 | . | 1.33 | 1.10 | 0.41 | 11.4 | . |
| 1 | JSS 861-3 | 46.60 | . | . | Al:0.161 | . | . | . | . | . | Ca:4.82 | (10.79) | . | . | . | . | Si:2.01 | . |
| 1 | AMIS 0404 | 45.93 | MnO: 59.45 | | (0.40) | . | . | . | . | Ca: 3.07 | 4.43 | 13.63 | 19.54 | (0.06) | 0.51 | 0.79 | 3.56 | (0.02) |
| 1 | NCS DC25008 | 45.47 | . | . | 6.81 | . | . | . | . | . | 0.071 | 3.21 | . | . | 0.077 | . | 9.51 | 0.087 |
| 1 | NCS DC26704 | 45.20 | (67.71) | . | 6.88 | . | . | . | . | C:0.090 | 0.103 | 6.03 | . | . | 0.097 | . | 5.55 | Ti:0.092 |
| 1 | NCS DC28045 | 44.97T | 67.67 | . | 2.35 | 0.042 | . | . | 0.058 | . | 0.195 | 2.75T | . | 1.48 | 0.182 | 0.034 | 16.00 | 0.105 |
| 1 | NCS DC26701 | 44.95 | (32.31) | . | 0.37 | . | . | . | . | C:1.22 | 7.53 | 10.50 | . | . | 1.05 | . | 5.41 | Ti:0.010 |
| 1 | NCS DC28210 | 44.76 | 66.46 | . | 7.28 | . | . | . | . | . | 0.24 | 5.72 | . | . | 0.257 | . | 4.62 | 0.34 |
| 1 | VS R12/2 | 43.24 | 52.4 | . | 1.87 | . | . | . | 0.53 | . | 2.02 | 1.56 | . | . | 1.16 | . | 15.00 | . |
| 1 | AMIS 0402 | 43.01 | MnO: 56.77 | | 0.38 | . | . | . | . | Ca: 3.88 | 5.70 | 15.38 | 22.12 | (0.02) | 0.54 | (0.11) | 4.31 | (0.024) |
| 1 | SARM 17 | 38.81 | . | . | 0.24 | . | . | . | (0.08) | . | (14.4) | 4.27 | . | 0.09 | 3.03 | 0.09 | 4.69 | . |
| 1 | SARM 149 | 38.0 | . | . | 0.221 | . | . | . | 0.050 | . | 14.2 | 5.39 | . | 0.132 | 2.08 | 0.147 | 5.89 | . |
| 1 | OREAS 170b | MnO: 59.46 | | . | 3.90 | . | . | . | . | . | 0.270 | . | 7.04 | 1.80 | 0.329 | 0.318 | 9.49 | 0.189 |
| 1 | OREAS 170a | MnO: 58.17 | | . | 4.44 | . | . | . | . | . | 0.090 | . | 6.49 | 1.70 | 0.222 | 0.276 | 11.34 | 0.179 |
| 1 | NCS DC28044 | 36.31T | 45.02 | . | 2.08 | 0.039 | . | . | 0.410 | . | 3.30 | 6.90T | . | 0.49 | 1.29 | 0.076 | 17.70 | 0.085 |
| 1 | AMIS 0407 | 35.72 | MnO: 46.81 | | 0.29 | . | . | . | Ca: 11.04 | | 15.81 | 4.10 | 6.03 | 0.04 | 3.17 | (0.039) | 5.51 | (0.02) |
| 1 | NCS DC11023 | 35.54T | 52.73 | . | 3.80 | 0.112 | . | . | 1.62 | . | 2.34 | 10.25T | . | 0.396 | 0.78 | 0.053 | 13.03 | 0.143 |
| 1 | **CGL 127** | MnO: 45.9 | | . | 9.27 | (0.0131) | . | (0.9384) | | . | (1.63) | . | 19.51T | (0.017) | 0.79 | (0.086) | 10.84 | 0.53 |
| 1 | NCS DC28062 | 34.67 | 51.64 | . | 9.97 | . | . | . | . | . | 0.48 | 8.05 | . | 1.14 | 0.87 | 0.063 | 10.70 | . |
| ~~1~~ | ~~VS 5404-90~~ | ~~34.12~~ | ~~48.66~~ | ~~.~~ | ~~5.28~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~4.68~~ | ~~6.68~~ | ~~.~~ | ~~0.83~~ | ~~0.45~~ | ~~0.38~~ | ~~15.69~~ | ~~0.27~~ |
| 1 | NCS DC28211 | 32.70 | 32.32 | . | 3.30 | . | . | . | . | . | 4.21 | 10.47 | . | . | 3.04 | . | 14.40 | 0.16 |
| 1 | AMIS 0406 | 32.27 | MnO: 41.81 | | 0.24 | . | . | . | Ca: 12.62 | | 18.13 | 4.62 | 6.77 | (0.11) | 3.51 | (0.14) | 4.36 | (0.02) |
| 1 | NCS DC28043 | 30.99T | 45.61 | . | 6.40 | 0.089 | . | . | 1.11 | . | 1.15 | 10.68T | . | 0.65 | 0.70 | 0.058 | 17.30 | 0.215 |
| 1 | NCS DC11022 | 29.48T | 41.76 | . | 6.49 | 0.062 | . | . | 1.04 | . | 1.82 | 10.22T | . | 0.89 | 0.65 | 0.062 | 19.84 | 0.224 |
| 1 | NCS DC28209 | 27.76 | 21.00 | . | 1.77 | . | . | . | . | . | 5.44 | 12.00 | . | . | 4.08 | . | 17.54 | 0.085 |
| 1 | NCS DC28063 | 27.45 | 39.38 | . | 10.05 | . | . | . | . | . | 0.99 | 8.10 | . | 1.57 | 1.16 | 0.064 | 20.96 | . |
| 1 | NCS DC11021 | 26.53T | 36.60 | . | 6.99 | 0.052 | . | . | 0.80 | . | 2.31 | 11.01T | . | 1.01 | 0.774 | 0.064 | 22.10 | 0.247 |
| 1 | NCS DC28061 | 22.93 | 33.45 | . | 9.88 | . | . | . | . | . | 1.11 | 6.71 | . | 1.95 | 0.94 | 0.053 | 31.42 | . |
| 1 | NCS DC28042 | 22.18T | 18.35 | . | 2.80 | 0.032 | . | . | 0.164 | . | 6.20 | 10.62T | . | 0.83 | 3.14 | 0.049 | 24.73 | 0.123 |
| 1 | NCS DC11020 | 22.31T | 30.34 | . | 7.69 | 0.034 | . | . | 0.54 | . | 2.36 | 9.66T | . | 1.11 | 1.72 | 0.056 | 28.11 | 0.270 |
| 1 | KZ 185-89 | 21.61T | . | . | 1.42 | . | . | . | . | . | 25.72 | 1.11T | . | 0.11 | 0.95 | . | 16.07 | 0.066 |
| 1 | NCS DC11019 | 18.36T | 25.59 | . | 5.66 | 0.031 | . | . | 0.43 | . | 12.83 | 8.89T | . | 1.04 | 0.611 | 0.045 | 21.94 | 0.206 |
| 1 | NCS DC28060 | 18.22 | 27.06 | . | 10.39 | . | . | . | . | . | 1.22 | 5.86 | . | 2.34 | 0.84 | 0.054 | 38.94 | . |
| ~~1~~ | ~~VS 5406-90~~ | ~~15.98~~ | ~~14.40~~ | ~~.~~ | ~~9.78~~ | ~~.~~ | ~~.~~ | ~~2.65~~ | ~~.~~ | ~~1.29~~ | ~~1.96~~ | ~~2.43~~ | ~~.~~ | ~~4.99~~ | ~~0.74~~ | ~~0.70~~ | ~~47.66~~ | ~~0.31~~ |
| 1 | NCS DC28041 | 14.45T | 20.66 | . | 8.25 | 0.013 | . | . | 0.064 | . | 2.07 | 0.85T | . | 3.74 | 0.60 | 0.48 | 56.03 | 0.177 |

| # | Number | Mn | $MnO_2$ | $Mn(CO_3)$ | $Al_2O_3$ | As | $As_2O_3$ | Ba | BaO | $CO_2$ | CaO | Fe | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Number | Cr | Cu | Ge | Ni | P | $P_2O_5$ | Pb | S | V | Zn | LOI | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IGS 29 | . | . | . | . | . | . | . | . | . | . | . | 40 g | |
| VS R13/3 | . | 0.0219 | . | 0.101 | 0.196 | . | 0.0013 | 0.07 | . | . | . | 100 g | |
| NCS DC26701 | . | 0.024 | . | (0.002) | 0.033 | . | 0.013 | 0.18 | . | 0.013 | . | 50 g | Co: 0.008 |
| VS P13/1 | . | . | . | . | 0.197 | . | 0.0014 | 0.070 | . | . | . | 100 g | MnO: 90.4, last of stock |
| SRM 25d | . | . | . | . | . | 0.251 | . | . | . | . | . | 60 g | available Oxygen: 14.28, $H_2O$: (0.96) |
| SARM 16 | . | . | . | . | 0.033 | . | . | 0.17 | . | 0.0364 | . | 100 g | |
| NCS DC35015 | . | 0.006 | . | 0.014 | . | . | 0.015 | . | . | 0.036 | . | 80 g | Co: 0.025 |
| JSS 861-2 | . | 0.0064 | . | . | 0.086 | . | . | 0.0084 | . | . | (3.3) | 100 g | Activated O: 13.55 |
| NCS DC26702 | . | 0.005 | . | 0.012 | 0.080 | . | 0.012 | 0.017 | . | 0.016 | . | 50 g | Co: 0.014 |
| BAM 633-1 | . | . | . | . | 0.170 | . | . | 0.227 | . | . | . | 100 g | |
| AMIS 0403 | Cr2O3: (0.03) | | . | . | . | 0.08 | . | specific gravity: 4.63 | | | 4.27 | 100 g | multiple Mn |
| RH01 | . | . | . | . | 0.28 | . | . | (0.025) | . | . | 12.8 | 100 g | |
| JSS 861-3 | . | 0.0169 | . | . | 0.036 | . | . | 0.307 | . | . | 0.66 | 100 g | Active O:6.24 |
| AMIS 0404 | Cr2O3: (0.024) | | . | . | . | (0.08) | . | specific gravity: 4.65 | | | 4.88 | 100 g | multiple Fe, Mn |
| NCS DC25008 | . | . | . | . | 0.094 | . | . | . | . | . | . | 50 g | B: 0.0018 |
| NCS DC26703 | . | 0.033 | . | 0.0024 | 0.009 | . | 0.018 | 0.003 | . | 0.219 | . | 50 g | Co: 0.0014 |
| NCS DC28045 | 0.038 | 0.022 | . | 0.079 | 0.230 | . | 0.011 | 0.0086 | 0.018 | 0.070 | . | 50 g | |
| NCS DC26704 | . | 0.009 | . | 0.039 | 0.127 | . | (0.007) | 0.028 | . | 0.052 | . | 50 g | Co: 0.096 |
| NCS DC28210 | . | 0.062 | . | 0.057 | 0.099 | . | 0.014 | . | . | 0.088 | . | 50 g | |
| VS R12/2 | . | . | . | . | 0.209 | . | . | 0.029 | . | . | . | 100 g | |
| AMIS 0402 | Cr2O3: (0.05) | | . | . | . | 0.10 | . | specific gravity: 4.62 | | | 4.97 | 100 g | multiple Ca, Fe, Mn |
| SARM 17 | . | . | . | . | 0.018 | . | . | (0.01) | . | 0.0043 | . | 100 g | last of stock |
| SARM 149 | . | . | . | . | 0.021 | . | . | . | . | . | . | 100 g | |
| OREAS 170b | . | . | . | . | . | 0.195 | . | . | . | . | 11.95 | 10 g | |
| OREAS 170a | . | . | . | . | . | 0.152 | . | . | . | . | 12.14 | 10 g | |
| NCS DC28044 | 0.0018 | 0.0086 | . | 0.010 | 0.105 | . | 0.0083 | 0.021 | 0.0075 | 0.027 | . | 50 g | |
| AMIS 0407 | Cr2O3: 0.22 | | . | . | . | (0.04) | . | specific gravity: 3.74 | | | 17.83 | 100 g | multiple Mn |
| NCS DC11023 | 0.0053 | 0.011 | . | 0.023 | 0.105 | . | 0.058 | 0.052 | 0.016 | 0.066 | . | 60 g | |
| **CGL 127** | (0.0086) | (0.0127) | **17025** | 0.0377 | . | 0.76 | (0.0038) | . | (0.0241) | 0.0182 | (6.41) | 100 g | mg/kg: Co:316 Y:104 Sr:1354 Zr:208 |
| NCS DC28062 | . | . | . | . | 0.050 | . | 0.011 | . | . | . | . | 50 g | |
| ~~VS 5404-90~~ | ~~.~~ | ~~.~~ | ~~0.00034~~ | ~~0.013~~ | ~~0.027~~ | ~~.~~ | ~~0.15~~ | ~~0.023~~ | ~~.~~ | ~~0.16~~ | ~~.~~ | ~~50 g~~ | ~~Co: 0.0086~~ |
| NCS DC28211 | . | 0.020 | . | 0.016 | 0.087 | . | 0.0090 | . | . | 0.027 | . | 50 g | |
| AMIS 0406 | Cr2O3: 0.08 | | . | . | . | (0.04) | . | specific gravity: 3.63 | | | 20.67 | 100 g | multiple Mn |
| NCS DC28043 | 0.013 | 0.015 | . | 0.083 | 0.171 | . | 0.110 | 0.100 | 0.019 | 0.235 | . | 50 g | |
| NCS DC11022 | 0.018 | 0.018 | . | 0.072 | 0.150 | . | 0.107 | 0.082 | 0.020 | 0.143 | . | 60 g | |
| NCS DC28209 | . | 0.0066 | . | 0.0025 | 0.069 | . | 0.0067 | . | . | 0.0071 | . | 100 g | |
| NCS DC28063 | . | . | . | . | 0.059 | . | 0.60 | . | . | . | . | 50 g | |
| NCS DC11021 | 0.019 | 0.021 | . | 0.073 | 0.163 | . | 0.124 | 0.084 | 0.020 | 0.164 | . | 60 g | |
| NCS DC28061 | . | . | . | . | 0.073 | . | 0.23 | . | . | . | . | 50 g | |
| NCS DC28042 | 0.0023 | 0.0071 | . | 0.0044 | 0.074 | . | 0.0066 | 0.044 | 0.0044 | 0.012 | . | 50 g | |
| NCS DC11020 | 0.026 | 0.021 | . | 0.089 | 0.171 | . | 0.120 | 0.109 | 0.020 | 0.170 | . | 60 g | |
| KZ 185-89 | . | . | . | . | 0.014 | . | 0.122 | 0.087T | . | 0.047 | . | 100 g | last |
| NCS DC11019 | 0.012 | 0.014 | . | 0.049 | 0.202 | . | 0.080 | 0.114 | 0.014 | 0.118 | . | 60 g | |
| NCS DC28060 | . | . | . | . | 0.082 | . | 0.025 | . | . | . | . | 50 g | |
| ~~VS 5406-90~~ | ~~.~~ | ~~.~~ | ~~0.00049~~ | ~~.~~ | ~~0.043~~ | ~~.~~ | ~~0.23~~ | ~~0.22~~ | ~~.~~ | ~~0.018~~ | ~~.~~ | ~~50 g~~ | |
| NCS DC28041 | . | . | . | . | 0.011 | . | 0.0025 | 0.012 | . | 0.015 | . | 50 g | |

| Number | Cr | Cu | Ge | Ni | P | $P_2O_5$ | Pb | S | V | Zn | LOI | Units | Other |

## CRM MANGANESE NODULE

analysis listed in mass % except * which is mg/kg T = Total * AMIS lists Mn by XRF and M/ICP

| Number | MnO | $MnO_2$ | $Al_2O_3$ | COrg | $CO_2$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Density | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US NOD-P-1~~ | ~~37.6~~ | ~~.~~ | ~~4.8~~ | ~~.~~ | ~~.~~ | ~~3.1~~ | ~~8.3T~~ | ~~1.2~~ | ~~3.3~~ | ~~2.2~~ | ~~0.46~~ | ~~13.9~~ | ~~0.5~~ | ~~.~~ | ~~.~~ | ~~25 g~~ |
| AMIS 0104* | 35.31* | 35.49* | 2.20 | . | . | 1.34 | 20.78 | 0.26 | (0.35) | (0.10) | (P: 192*) | 18.30 | 0.27 | (3.28) | 4.32 | 100 g or 1kg |
| VS 5374-90 | 35.09T | 41.7 | 5.68 | 0.18 | 0.43 | 2.82 | 9.28T | 1.27 | 3.40 | 2.94 | 0.68 | 16.60 | 0.74 | 15.3 | . | 50 g |
| JMn-1 | 33.09 | . | 4.30 | . | . | 2.91 | 14.40T | 0.94 | 3.12 | 2.80 | 0.54 | 14.11 | 1.06 | . | . | 100 g |
| VS 5375-90 | 25.16T | 31.1 | 5.46 | 0.22 | 0.60 | 3.01 | 24.87T | 0.83 | 2.24 | 2.40 | 0.80 | 14.50 | 1.91 | 13.8 | . | 50 g |
| ~~US NOD-A-1~~ | ~~23.9~~ | ~~.~~ | ~~3.87~~ | ~~.~~ | ~~.~~ | ~~15.4~~ | ~~15.6T~~ | ~~0.6~~ | ~~4.76~~ | ~~1.0~~ | ~~1.40~~ | ~~3.81~~ | ~~0.53~~ | ~~.~~ | ~~.~~ | ~~25 g~~ |
| VS 5376-90 | 19.85T | 24.2 | 6.71 | . | 0.50 | 5.13 | 22.13T | 1.18 | 2.29 | 2.24 | 1.61 | 22.30 | 1.56 | 11.4 | . | 100 g |

| Number | As | Au* | B* | Ba | Be* | Bi* | C* | Cd* | Ce | Cl | Co | Cr | $Cr_2O_3$ | Cs* | Cu | Dy* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US NOD-P-1~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.3350~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.0290)~~ | ~~.~~ | ~~0.2240~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.1500~~ | ~~(27)~~ |
| AMIS 0104 | (0.0116) | . | . | 2.86 | (2.1) | (0.61) | . | (0.78) | (0.02994) | . | 0.0240 | (0.01802) | (0.03) | (0.19) | (0.0192) | (10.6) |
| VS 5374-90 | 0.006 | 0.005 | . | 0.18 | . | . | . | 17 | 0.020 | 0.7 | 0.220 | 0.0018 | . | . | 1.01 | . |
| JMn-1 | 0.00754 | (0.00095) | (138) | 0.1714 | (7.8) | (4.3) | (905) | (15.5) | 0.0277 | . | 0.1732 | 0.00266 | . | 0.60 | 1.1132 | (28.3) |
| VS 5375-90 | 0.017 | 0.010 | . | 0.17 | . | . | . | 5 | 0.09 | 0.9 | 0.47 | 0.0019 | . | . | 0.22 | . |
| ~~US NOD-A-1~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.1670~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.0730)~~ | ~~.~~ | ~~0.3110~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.1100~~ | ~~(23)~~ |
| VS 5376-90 | 0.014 | . | . | 0.16 | 19 | . | . | . | 0.10 | . | 0.27 | 0.0067 | . | . | 0.13 | . |

| Number | Er* | Eu* | Ga* | Gd* | Ge* | $H_2O+$ | Hf* | Ho* | In* | La | Li | Lu* | Mo | Nb | Nd | Ni |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US NOD-P-1~~ | ~~(12)~~ | ~~(7.5)~~ | ~~.~~ | ~~(28)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.0104)~~ | ~~.~~ | ~~(1.8)~~ | ~~0.0760~~ | ~~.~~ | ~~(0.0120)~~ | ~~1.3400~~ |
| AMIS 0104 | (5.7) | (4.3) | (35.8) | (12.1) | (1.7) | . | (3.0) | (2.0) | (0.05) | (0.00444) | (0.00183) | (0.66) | (0.00047) | (0.00055) | (0.00557) | (0.00421) |
| VS 5374-90 | . | . | . | . | . | . | . | . | . | 0.009 | 0.014 | . | 0.052 | 0.0020 | 0.008 | 1.37 |
| JMn-1 | 14.6 | 7.6 | (37.1) | (29.8) | . | (7.90) | (6.2) | (5.8) | . | 0.0122 | (0.00717) | 2.1 | 0.0318 | (0.00276) | 0.0137 | 1.2632 |
| VS 5375-90 | . | . | . | . | . | . | . | . | . | 0.014 | 0.004 | . | 0.033 | 0.009 | 0.014 | 0.422 |
| ~~US NOD-A-1~~ | ~~(12)~~ | ~~(5)~~ | ~~.~~ | ~~(26)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.0120)~~ | ~~.~~ | ~~(2.2)~~ | ~~0.0448~~ | ~~.~~ | ~~(0.0094)~~ | ~~0.6360~~ |
| VS 5376-90 | . | . | . | . | . | . | . | . | . | 0.012 | 0.0019 | . | 0.035 | 0.006 | 0.010 | 0.34 |

| Number | Li | Lu* | Mo | Nb | Nd | Ni | Pb | Pd* | Pr* | Pt* | Rb* | S | Sb* | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US NOD-P-1~~ | ~~.~~ | ~~(1.8)~~ | ~~0.0760~~ | ~~.~~ | ~~(0.0120)~~ | ~~1.3400~~ | ~~0.0560~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| AMIS 0104 | (0.00183) | (0.66) | (0.00047) | (0.00055) | (0.00557) | (0.00421) | (0.00507) | . | (12.6) | . | (5.3) | (0.32) | (9.7) | (4.6) |
| VS 5374-90 | 0.014 | . | 0.052 | 0.0020 | 0.008 | 1.37 | 0.040 | . | . | 0.10 | 21 | 0.10 | . | 11 |
| JMn-1 | (0.00717) | 2.1 | 0.0318 | (0.00276) | 0.0137 | 1.2632 | 0.0430 | . | (31.4) | (0.110) | 10.9 | (0.0940) | 37.5 | (13.0) |
| VS 5375-90 | 0.004 | . | 0.033 | 0.009 | 0.014 | 0.422 | 0.098 | 0.003 | . | 0.21 | 10 | 0.16 | . | 13 |
| ~~US NOD-A-1~~ | ~~.~~ | ~~(2.2)~~ | ~~0.0448~~ | ~~.~~ | ~~(0.0094)~~ | ~~0.6360~~ | ~~0.0846~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| VS 5376-90 | 0.0019 | . | 0.035 | 0.006 | 0.010 | 0.34 | 0.105 | . | . | . | 19 | 0.16 | . | 19 |

| Number | Sm | Sn* | Sr | Ta* | Tb* | Th* | Tl | Tm* | U* | V | W* | Y | Yb* | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US NOD-P-1~~ | ~~(0.0030)~~ | ~~.~~ | ~~0.0680~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0570~~ | ~~.~~ | ~~.~~ | ~~(1.3)~~ | ~~0.1600~~ | ~~.~~ |
| AMIS 0104 | (0.00128) | (2.0) | (0.0309) | (0.21) | (1.8) | (9.5) | (0.42*) | (0.78) | (8.1) | (0.0108) | (3.5) | (0.00412) | (4.9) | 0.0142 | (0.01341) |
| VS 5374-90 | 0.0022 | . | 0.064 | . | . | 17 | . | . | 4 | 0.043 | . | 0.011 | 13 | 0.12 | 0.032 |
| JMn-1 | 0.00302 | (4.4) | 0.0792 | (0.64) | 4.8 | 11.7 | . | 2.1 | 5.0 | 0.0424 | (45.3) | 0.0111 | 13.8 | 0.1068 | 0.0344 |
| VS 5375-90 | 0.003 | . | 0.11 | . | . | 38 | . | . | 8 | 0.048 | . | 0.014 | 14 | 0.058 | 0.060 |
| ~~US NOD-A-1~~ | ~~(0.0021)~~ | ~~.~~ | ~~0.1750~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0770~~ | ~~.~~ | ~~.~~ | ~~(14)~~ | ~~0.0590~~ | ~~.~~ |
| VS 5376-90 | 0.0027 | . | 0.11 | . | . | 28 | 0.010% | . | 6 | 0.054 | . | 0.016 | 6 | 0.060 | 0.055 |

## CRM MANGANESE NODULE

analysis in mass %

| Number | $SiO_2$ | Co | Cu | T.Fe | T.Mn | Ni | Units |
|---|---|---|---|---|---|---|---|
| ~~NM 2388~~ | ~~16.07~~ | ~~0.14~~ | ~~0.49~~ | ~~14.94~~ | ~~21.28~~ | ~~0.71~~ | ~~100 g~~ |

## CRM MARIPOLITE

analysis listed in mass % 40 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $K_2O$ | MnO | $Na_2O$ | Nb | Rb | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2122-81~~ | ~~21.96~~ | ~~0.72~~ | ~~1.20~~ | ~~0.88~~ | ~~2.05~~ | ~~4.30~~ | ~~0.085~~ | ~~10.79~~ | ~~0.034~~ | ~~0.030~~ | ~~56.29~~ | ~~0.045~~ |

continued analysis listed in mg/kg

| Number | Ba | Be | Cr | Cu | Ga | Ge | La | Li | Mo | Ni | Pb | Sn | Sr | V | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2122-81~~ | ~~170~~ | ~~86~~ | ~~9.8~~ | ~~21~~ | ~~80~~ | ~~1.4~~ | ~~130~~ | ~~4.3~~ | ~~5.2~~ | ~~6.5~~ | ~~25~~ | ~~15~~ | ~~120~~ | ~~13~~ | ~~64~~ | ~~5~~ | ~~69~~ | ~~70~~ |

## CRM MERCURY ORE

analysis listed in mass % 100 g units

| Number | Hg | $Al_2O_3$ | CaO | FeO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $SiO_2$ | $TiO_2$ | Co | Cr | Cu | Ni | Sr | V | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 43-2006 | 0.0689 | 0.53 | 17.39 | 0.49 | 4.66 | 0.03 | 9.93 | 0.29 | 0.07 | 41.01 | 0.018 | 0.0047 | 0.21 | 0.0007 | 0.10 | 0.0382 | 0.0038 | 25.28 |

## RM MOLOCHITE

analysis listed in mass % 25 g units

| Number | $Al_2O_3$ | BaO | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Mn_3O_4$ | $Na_2O$ | $P_2O_5$ | $SiO_2$ | SrO | $TiO_2$ | $ZrO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CERAM AN40~~ | ~~37.9~~ | ~~0.03~~ | ~~0.14~~ | ~~0.85~~ | ~~1.52~~ | ~~0.24~~ | ~~0.01~~ | ~~0.12~~ | ~~0.11~~ | ~~58.8~~ | ~~0.02~~ | ~~0.06~~ | ~~0.016~~ |

## CRM MOLYBDENUM ORE AND CONCENTRATE

analysis listed in mass % 50 g units

| Number | Mo | $Al_2O_3$ | As | Bi | C | CaO | Co | Cr | Cu | F | $Fe_2O_3$ | $K_2O$ | MgO | Mn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28184 | 54.29 | 1.35 | 0.0075 | 0.0008 | 0.35 | 0.43 | 0.001 | 0.0006 | 0.251 | 0.034 | 0.964 | 0.18 | 0.16 | 0.0064 |
| NCS DC28183 | 46.18 | 1.52 | 0.004 | 0.029 | 0.62 | 0.91 | 0.0014 | 0.0029 | 0.354 | 0.17 | 5.62 | 0.40 | 0.24 | 0.030 |
| NCS DC28186 | 5.67 | 8.69 | 0.0049 | . | 0.27 | 1.42 | 0.0011 | 0.0015 | 0.329 | 0.14 | 3.29 | 4.27 | 0.83 | 0.032 |
| NCS DC28185 | 2.04 | 9.53 | 0.0049 | . | 0.24 | 1.52 | 0.0008 | 0.0018 | 0.322 | 0.14 | 3.08 | 4.43 | 0.86 | 0.037 |
| NCS DC28182 | 0.24 | 9.76 | 0.0054 | . | 0.23 | 1.41 | 0.0011 | 0.0008 | 0.312 | 0.14 | 2.93 | 4.71 | 0.91 | 0.036 |

| Number | $Na_2O$ | Ni | P | Pb | Re | S | Sb | $SiO_2$ | Sn | $TiO_2$ | W | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28184 | 0.078 | <0.0020 | 0.0044 | 0.057 | 0.0022 | 36.88 | 0.0002 | 4.52 | 0.0013 | 0.019 | 0.0071 | 0.018 |
| NCS DC28183 | 0.068 | 0.0016 | 0.013 | 0.432 | 0.0022 | 35.50 | 0.0004 | 8.35 | <0.004 | 0.048 | 0.0046 | 0.088 |
| NCS DC28186 | 1.22 | 0.0006 | 0.036 | 0.032 | . | 5.73 | . | 66.50 | 0.0011 | 0.21 | 0.0019 | 0.019 |
| NCS DC28185 | 1.28 | 0.0008 | 0.034 | 0.016 | . | 3.00 | . | 71.32 | 0.0013 | 0.237 | 0.0019 | 0.014 |
| NCS DC28182 | 1.34 | 0.0012 | 0.038 | <0.008 | . | 1.74 | . | 72.60 | 0.0014 | 0.212 | 0.0019 | 0.011 |

## CRM MOLYBDENUM ORE WITH EXTENSIVE ANALYSIS

analysis listed in mass % 50 g units

| Number | Mo | $Al_2O_3$ | Ba | CaO | F | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | S | $SiO_2$ | $TiO_2$ | W | $WO_2$ | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC93010a* | 55.4 | 0.23 | . | 0.95 | C:0.34 | 1.44 | . | 0.47 | . | Cu:0.06 | . | 2.56 | . | 0.12 | . | 0.014 | . |
| NCS DC73522 | 50.08 | (1.16) | . | 1.95 | . | 1.23 | (0.06) | 1.96 | . | (0.21) | 33.72 | 7.58 | . | 0.0732 | . | 0.0068 | . |
| GBW 07238 | 1.51 | 3.46 | . | 31.44 | 4.08 | 21.34 | 0.046 | 0.86 | 1.40 | 0.075 | 1.64 | 34.10 | 0.13 | 0.36 | . | 0.000655 | . |
| NCS DC73521 | 0.54 | 5.12 | . | 18.09 | . | 9.88 | 0.66 | 4.35 | . | 0.90 | 0.68 | 56.87 | . | 0.0557 | . | 0.0360 | . |
| NCS DC73520 | 0.15 | 5.20 | . | 18.13 | . | 9.89 | 0.66 | 4.37 | . | 0.91 | 0.44 | 57.47 | . | 0.0518 | . | 0.0365 | . |
| KZ 7025-93 | 0.067 | . | 0.27 | . | . | . | . | . | . | . | . | . | . | . | 0.04 | . | 0.013 |
| NCS DC73519 * | 0.066 | 5.20 | . | 18.37 | . | 10.05 | 0.66 | 4.29 | . | 0.90 | 0.38 | 57.23 | . | 0.0489 | . | 0.0357 | . |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | Be | Bi | Cd | Co | Ce | Cr | Cu | Dy | Eu | Er | Ga | Gd | Ge | Ho | In | La | Li | Lu | Mn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC93010a* | . | . | . | 52 | . | . | . | . | 600 | . | . | . | . | . | . | . | . | . | . | . | 0.033 |
| NCS DC73522 | (2.1) | (2.2) | . | 86 | 0.20 | 10.2 | . | 30 | 266 | . | . | . | . | . | (0.67) | . | . | . | . | . | 0.15 |
| GBW 07238 | 0.09 | 1.6 | . | 2.2 | 0.12 | . | 20.8 | (24) | 93.6 | 1.8 | 0.59 | 1.0 | 25.1 | 1.9 | 19.0 | 0.36 | 2.9 | 7.1 | (3.2) | 0.16 | . |
| NCS DC73521 | 0.13 | 4.7 | . | 8.2 | 0.52 | 13.2 | . | 23 | 48 | . | . | . | . | . | 6.2 | . | . | . | . | . | 0.91 |
| NCS DC73520 | 0.10 | 4.8 | . | 7.4 | 0.52 | 12.9 | . | 23 | 46 | . | . | . | . | . | 6.0 | . | . | . | . | . | 0.91 |
| KZ 7025-93 | 0.8 | . | 19 | 51 | . | . | . | . | 0.077% | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC73519 * | (0.11) | 5.2 | . | 6.9 | 0.50 | 13.3 | . | 23 | 46 | . | . | . | . | . | 6.2 | . | . | . | . | . | 0.92 |

| Number | Nb | Nd | Ni | P | Pb | Pr | Re | Sb | Sc | Se | Sm | Sn | Tb | Te | Th | Tl | Tm | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC93010a* | . | . | . | 55 | 440 | . | 26 | . | . | . | . | . | * also contains Total Oil and Water:(0.34%) | | | | | | |
| NCS DC73522 | . | . | (20) | (130) | 316 | . | 23 | 13.2 | . | . | . | (11.9) | . | . | . | . | . | . | . |
| GBW 07238 | . | 11.3 | 17.8 | . | 18.7 | 3.0 | (0.35) | 1.2 | 3.4 | 2.1 | 2.1 | 86.7 | 0.34 | 0.40 | 2.3 | 0.06 | 0.14 | 11.4 | 1.0 |
| NCS DC73521 | . | . | 52 | (1210) | 13.7 | . | 0.31 | 0.73 | . | . | . | 4.7 | . | . | . | . | . | . | . |
| NCS DC73520 | . | . | 52 | (1231) | 10.5 | . | 0.12 | 0.60 | . | . | . | 4.5 | . | . | . | . | . | . | . |
| KZ 7025-93 | 13 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC73519 * | . | . | 54 | (1160) | 9.1 | . | (0.07) | 0.58 | . | . | . | 4.7 | * also contains Total Oil and Water: 0.85% | | | | | | |

## CRM MOLYBDENUM ORE AND CONCENTRATE

% = mass % * = mg/kg Insol = Insoluble Residue

| Number | Mo% | Ag* | As* | Bi* | Cu% | Fe% | Insol% | Na% | P% | Pb% | Re% | S% | Sb* | $SiO_2$% | W* | Zn% | Units/g |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 423~~ | ~~58.61~~ | ~~(29)~~ | ~~.~~ | ~~(60)~~ | ~~0.0640~~ | ~~1.708~~ | ~~7.69~~ | ~~(0.2)~~ | ~~.~~ | ~~0.0433~~ | ~~(0.004)~~ | ~~(0.063)~~ | ~~(24)~~ | ~~.~~ | ~~.~~ | ~~(0.017)~~ | ~~50~~ |
| CGL 202 | 51.5 | . | (278) | . | (1.34) | (1.44) | . | . | (0.014) | (0.0160) | (0.05) | (35.66) | . | (4.50) | . | . | 150 |
| GMO-04 | 0.7949 | 1.93 | 4.52 | 95 | 0.0240 | . | . | . | . | 0.0046 | . | . | 8.9 | . | . | 0.0128 | 10 or 250 |
| GMO-03 | 0.5329 | 1.47 | 3.50 | 72 | 0.0191 | . | . | . | . | 0.0037 | . | . | 6.8 | . | . | 0.0122 | 10 or 250 |
| GMO-12 | 0.4797 | 1.04 | 3.5 | 50.0 | 0.01425 | . | . | . | . | 0.00346 | . | 0.39 | 4.41 | . | 1.2 | 0.0104 | 10 or 250 |
| GMO-11 | 0.2937 | 0.89 | 3.3 | 40.2 | 0.01155 | . | . | . | . | 0.00319 | . | 0.26 | 3.40 | . | 0.8 | 0.0101 | 10 or 250 |
| GMO-10 | 0.0953 | 0.55 | 2.6 | 15.3 | 0.00698 | . | . | . | . | 0.00262 | . | 0.13 | 1.36 | . | 0.6 | 0.0096 | 10 or 250 |
| GMO-07 | 0.00447 | 6.10 | 74.00 | 0.3 | 0.0014 | . | . | . | . | 0.0011 | . | . | 0.1 | . | last | 0.0011 | 10 or 250 |
| GMO-05 | 0.00277 | 0.88 | 12.71 | 11 | 0.0639 | . | . | . | . | 0.0013 | . | . | 0.5 | . | . | 0.0087 | 10 or 250 |

## RM MOLYBDENUM CONCENTRATE

analysis listed in mass % 100 g units

| Number | Mo | $Al_2O_3$ | Tot.C | CaO | $Cr_2O_3$ | CuO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | S | $SiO_2$ | SrO | $TiO_2$ | $V_2O_5$ | ZnO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH 4707 | 61.08 | 0.702 | 0.040 | 1.61 | 0.004 | 0.504 | 1.80 | 0.182 | 0.117 | 0.008 | 0.045 | 0.069 | 4.38 | . | 0.040 | . | 0.064 |
| DH 4706 | 57.55 | 1.178 | 0.016 | 0.644 | . | 0.106 | 3.83 | 0.407 | 0.207 | 0.036 | 1.009 | 0.050 | 7.52 | . | 0.092 | . | . |

## CRM MULTI-METAL ORE

analysis listed in mass % 50 g units

| Number | Fe | Cu | Pb | S | Zn | $Al_2O_3$ | As | C | CaO | $K_2O$ | MgO | Mn | $Na_2O$ | $SiO_2$ | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73511a | 28.14 | 21.67 | 0.64 | 30.7 | 1.35 | 0.52 | 0.0253 | (0.3) | 2.03 | 0.10 | 0.74 | 0.019 | (0.06) | 3.91 | 0.00052 |
| NCS DC73507a | 27.85 | 0.72 | 0.72 | 7.07 | 0.94 | 3.38 | 0.0243 | 1.54 | 13.37 | 0.34 | 4.70 | 0.12 | 0.80 | 23.79 | 0.00050 |
| NCS DC73510a | 20.71 | 0.081 | 4.85 | 30.8 | 13.73 | 2.09 | 0.1244 | 1.90 | 7.91 | 0.64 | 0.71 | 0.056 | 0.033 | 9.61 | 0.00381 |
| NCS DC73513a | 7.33 | 1.79 | 0.80 | 31.6 | 50.59 | 0.45 | 0.0363 | 0.33 | 0.89 | 0.13 | 0.15 | 0.022 | (0.02) | 2.80 | 0.00068 |
| NCS DC73508a | 6.18 | 1.94 | 5.97 | 5.67 | 3.30 | 7.03 | 0.228 | (0.1) | 1.27 | 2.83 | 0.23 | 0.42 | 0.63 | 57.8 | 0.398 |
| NCS DC73509a | 5.75 | 2.81 | 0.34 | 3.32 | 0.36 | 8.10 | 0.0136 | (0.06) | 0.77 | 3.32 | 0.09 | 0.46 | 0.73 | 68.4 | 0.1288 |

continued analysis listed in mg/kg

| Number | Ag | Bi | Cd | Ce | Ga | Ge | Hg | In | Mo | Re | Sb | Se | Sn | Te | Tl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73511a | 45.5 | 8.0 | 39.4 | 19.5 | 8.8 | 2.8 | 11.1 | 5.8 | 18.3 | (0.004) | 32.8 | (15.5) | 2.8 | (2) | 0.32 |
| NCS DC73507a | 14.7 | 0.89 | 24.6 | 112 | 24.7 | 4.3 | 9.6 | 0.47 | 2.1 | (0.0016) | 18.4 | (1.8) | 2.0 | (0.2) | 0.11 |
| NCS DC73510a | 104 | 9.4 | 357 | 12.7 | 69.2 | 31.5 | 120 | 0.80 | 3.3 | (0.007) | 111 | (0.7) | (10) | (0.2) | 0.34 |
| NCS DC73513a | 126 | 1.1 | 1207 | 5.0 | 103 | 65.5 | 472 | 1.5 | 2.7 | (0.007) | 93.5 | (1.4) | (4) | (0.3) | (0.2) |
| NCS DC73508a | 392 | 1640 | 317 | 25.2 | 11.9 | 2.8 | 1.3 | 13.1 | 189 | (0.015) | 787 | (17) | 944 | (5) | 6.5 |
| NCS DC73509a | 150 | 570 | 59.1 | 24.4 | 13.6 | 3.3 | 0.95 | 14.3 | 138 | (0.068) | 63.3 | (7) | 991 | (0.5) | 4.4 |

## CRM MULTI-METAL ORE

analysis in mass % except g/T for grams per ton and * for mg/kg

| Number | Ag | $Al_2O_3$ | As | Bi | Cd | Cu | Fe | Hg* | Pb | S | Sb | $SiO_2$ | Sn | Zn | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC29114 | 0.03679 | (1.42) | 0.138 | . | 0.066 | 0.071 | (11.48T) | (270) | **22.96** | (15.92) | 0.044 | (20.20) | . | 16.22 | (12.14) | 50 g |
| NCS DC29112 | 0.0362 | (7.83) | 0.082 | . | . | 0.10 | (11.61T) | (0.233) | **2.93** | (8.17) | 0.011 | (59.40) | . | 0.51 | (10.49) | 50 g |
| NCS DC29113 | 0.0103 | (3.97) | 0.040 | . | . | 0.075 | (8.65T) | (0.074) | **2.19** | (6.02) | 0.00383 | (31.99) | . | 1.54 | (13.40) | 50 g |
| NCS DC35008 | 19.8 g/T | . | 0.084 | . | . | 0.037 | 22.62 | . | **2.07** | . | 0.013 | . | 0.125 | 0.51 | . | 60 g |
| NCS DC29115 | 0.000530 | (3.25) | 0.0095 | . | 0.119 | 0.021 | (3.93T) | (84.8) | **1.25** | (16.30) | 0.00205 | (41.23) | . | 30.19 | (9.52) | 50 g |
| NCS DC29111 | 0.00129 | (9.96) | 0.0090 | . | 0.019 | 0.020 | (2.62T) | (12.6) | **0.48** | (3.13) | 0.00090 | (69.88) | . | 4.94 | (3.70) | 50 g |
| ~~NCS DC35009~~ | ~~.~~ | ~~6.70~~ | ~~2.17~~ | ~~0.120~~ | ~~.~~ | ~~1.09~~ | ~~.~~ | ~~.~~ | ~~**0.095**~~ | ~~.~~ | ~~.~~ | ~~4.99~~ | ~~0.930~~ | ~~1.49~~ | ~~.~~ | ~~60 g~~ |

T = Total Fe as $Fe_2O_3$

## CRM MULTI-METAL ORE WITH EXTENSIVE ANALYSIS

analysis listed in mass % CAN PTC-1b shows classical and instrumental values for Cu and Ni # $SiO_2$* RTS-5: 100 g others: 200 g

| Number | Al | As | Ca | Cu | Fe | Mg | Mo | Ni | Pb | S | Si | Sn | W | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN RTS-5 | 6.25 | 0.1286 | 3.86 | 0.0647 | 11.9 | 3.31 | (0.0001338) | 0.1104 | 0.00663 | 1.924 | 19.20 | . | . | 0.0105 | (9.90) |
| CAN MP-2a | 5.99 | (0.558) | 3.22 | 0.0459 | 5.00 | 0.0923 | 0.1586 | (0.00098) | 0.277 | 0.716 | 31.2 | 0.0537 | 0.338 | 0.566 | (4) |
| CAN SU-1b | 4.30 | 0.000249 | 2.21 | 1.185 | 25.54 | 1.790 | (0.0004) | 1.953 | 0.0058 | 14.14 | 15.23 | . | . | 0.0235 | (8) |
| CAN PTC-1b | (0.7518) | 0.0222 | (0.571) | 7.919,7.97# | 36.78 | 0.441 | (0.0011) | 11.256,11.29# | 0.0795 | 29.95 | 2.468 | (0.0120) | . | 0.2083 | (13.44) |
| CAN MP-1b | . | 2.30 | 2.47 | 3.069 | 8.19 | 0.024 | 0.0285 | . | 2.091 | 13.79 | 16.79* | 1.61 | (0.1100) | 16.67 | . |
| CAN RTS-5 | 6.25 | 0.1286 | 3.86 | 0.0647 | 11.9 | 3.31 | (0.0001338) | 0.1104 | 0.00663 | 1.924 | 19.20 | . | . | 0.0105 | (9.90) |

continued analysis listed in mg/kg except % for mass %

| Number | Ag | Au | Ba | Be | Bi | C% | Cd | Ce | Co | Cr | Cs | Dy | Er | Eu | Ga | Gd | Ge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN RTS-5 | 1.50 | 0.408 | 252 | (0.7) | (2.05) | (1.617) | . | (17.0) | 76.9 | 261 | (1.0) | (2) | (2) | (0.6) | (14) | . | . |
| CAN MP-2a | 4.82 | (0.06) | 12.3 | 1.25 | 989 | (0.04) | 14.5 | 357 | 5.50 | 150 | 5.78 | 32.5 | (22.8) | (0.1) | (26.2) | 24.8 | (8) |
| CAN SU-1b | 6.39 | (0.2) | (350) | (0.4) | (2.73) | (0.04) | (3) | (35) | 672 | (320) | (0.3) | (1.4) | (0.7) | (0.7) | (10) | (2) | . |
| CAN PTC-1b | 53.1 | 1.99 | (61.5) | . | . | . | (38) | . | 3253 | (40) | . | . | . | . | . | . | . |
| CAN MP-1b | 470 | . | . | . | 954 | (0.028) | 527 | . | (4) | . | . | . | . | (1) | . | . | . |

| Number | $H_2O$% | Hf | Ho | In | Ir | K% | La | Li | Lu | Mn% | Na% | Nb | Nd | P% | Pd | Pr | Pt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN RTS-5 | (1.4) | . | . | . | . | 0.850 | (9.7) | (16.9) | (0.3) | 0.1092 | 1.285 | (4) | (8) | 0.0369 | (0.14) | . | (0.2) |
| CAN MP-2a | . | 9.40 | (7.04) | (12.09) | . | (1.226) | 157 | 81 | 4.36 | 0.1018 | (0.03) | 97 | 117.9 | (0.0090) | . | 38.5 | . |
| CAN SU-1b | . | . | (0.3) | . | . | (0.6) | (17) | . | (0.09) | 0.0703 | (1.6) | (3) | (15) | (0.06) | 0.791 | . | 0.491 |
| CAN PTC-1b | 0.81 | . | . | . | (0.2) | (0.15) | . | . | . | (0.0193) | (0.17) | . | . | . | 9.46 | . | 6.47 |
| CAN MP-1b | . | (6) | . | (565) | . | (0.2) | . | . | (4) | (0.0480) | . | . | . | (0.02) | . | . | . |

| Number | Rb | Rh | Sb | Sc | Se | Sm | Sr | Ta | Tb | Te | Th | Ti | Tl | Tm | U | V | Y | Yb | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN RTS-5 | (30.5) | . | SO4:(1.23%) | . | (8.03) | . | 130.6 | . | . | . | (2.25) | 3132 | . | . | . | (61.2) | (10.1) | . | . |
| CAN MP-2a | 229 | . | (7.84) | 4.87 | . | 26.7 | 12.3 | 11.6 | 4.82 | (5.75) | 61.3 | 268 | (3.16) | 4.10 | 37 | . | (229) | 28.8 | 134 |
| CAN SU-1b | (13) | . | (0.2) | (9) | (20.7) | (3) | (280) | . | . | . | . | . | (0.3) | . | (0.2) | (82.5) | (7) | (0.6) | . |
| CAN PTC-1b | . | (0.5) | (6) | . | (120) | . | (30) | . | . | (30) | . | (696) | . | . | . | (20) | (3) | . | . |
| CAN MP-1b | . | . | (54.0) | (3) | . | . | . | . | (5) | . | (50) | . | . | . | (20) | . | . | . | (150) |

## CRM MULTI-METAL ORE

10 or 250 g units

| Number | Pb% | Cu% | Ni% | S% | Zn% | Ag* | As* | Co* |
|---|---|---|---|---|---|---|---|---|
| OREAS 317 | 12.13 | . | . | . | 17.45 | 232 | . | . |
| GBM920-7 | 3.0808 | 2.9848 | 0.0079 | . | 4.1046 | 133.9 | 586 | 89 |
| GBM995-8 | 2.5919 | 0.0264 | 0.0060 | . | 12.4308 | 52.0 | 53 | . |
| GBM399-5 | 2.1173 | 2.9424 | 2.4412 | . | 0.9493 | 24.2 | 320 | 46 |
| GBM323-5 | 1.0556 | 1.4364 | 0.0075 | . | 3.0969 | 19 | 1257 | 68 |
| GBM922-15 | 0.4723 | 3.4460 | 0.0066 | 4.91 | 1.5326 | 51.2 | . | . |
| GBM914-10 | 0.4671 | 0.1864 | 0.0011 | . | 0.9697 | 9.4 | 11 | 20 |
| GBM315-9 | 0.4600 | 3.4274 | 0.0071 | . | 1.5131 | 50.2 | 278 | 135 |
| GBM323-13 | 0.4036 | 0.4607 | 0.0447 | 0.64 | 0.3852 | 7.3 | . | . |
| GBM319-5 | 0.4022 | 0.4574 | 0.0443 | . | 0.3833 | 7.4 | 805 | 539 |
| GBM311-12 | 0.3600 | 1.0188 | 0.0668 | 4.4 | 1.4425 | 20.6 | . | . |
| GBM311-3 | 0.3522 | 1.0089 | 0.0642 | . | 1.4291 | 20.4 | 359 | 122 |
| GBM921-7 | 0.3048 | 0.5834 | 0.0042 | . | 0.9688 | 19.2 | 346 | 42 |
| GBM321-10 | 0.2592 | 0.3329 | 0.0121 | . | 0.3417 | 6.7 | 111 | 33 |
| GBM915-7 | 0.2487 | 0.5934 | 0.0073 | . | 0.5037 | 12.8 | 329 | 47 |
| GBM321-8 | 0.2039 | 0.3605 | 0.2236 | . | 0.1053 | 3 | 57 | 27 |
| GBM322-8 | 0.1970 | 0.2951 | 0.2136 | . | 0.7016 | 8.4 | 735 | 165 |
| GBM396-1 | 0.1916 | 0.2873 | 0.2140 | . | 0.6990 | 8.1 | 743 | . |
| GBM921-10 | 0.1902 | 0.2292 | 0.0397 | . | 0.1959 | 10.2 | 745 | 59 |
| GBM319-6 | 0.1887 | 0.2186 | 0.0225 | . | 0.1842 | 3.5 | 375 | 271 |
| GBM319-6 | 0.1887 | 0.2186 | 0.0225 | . | 0.1842 | 3.5 | 375 | 271 |
| GBM901-8 | 0.1657 | 0.0837 | 0.0132 | . | 0.0272 | 2.2 | 917 | 113 |
| GBM322-15 | 0.1343 | 0.1698 | 0.0223 | 2.21 | 0.8817 | 29 | . | . |
| GBM916-2 | 0.1335 | 0.1675 | 0.0223 | . | 0.8792 | 29.0 | 72 | 10 |
| GBM906-10 | 0.1252 | 0.1916 | 0.0032 | . | 0.0595 | 1.6 | 18 | 27 |
| GBM316-1 | 0.1248 | 0.2966 | 0.0052 | . | 0.2572 | 6.3 | 163 | 40 |
| GBM319-3 | 0.1116 | 0.4055 | 0.0025 | . | 0.4067 | 7.4 | 887 | 211 |
| GBM999-8 | 0.1061 | 0.1852 | 0.3014 | . | 0.0537 | 1.8 | 185 | 25 |
| GBM913-8 | 0.0923 | 0.4379 | 0.0006 | . | 0.0127 | 6.7 | 1409 | 12 |
| GBM322-10 | 0.0904 | 0.0707 | 0.0261 | . | 0.0809 | 3 | 759 | 53 |
| GBM914-8 | 0.0849 | 0.6241 | 0.0414 | . | 0.3786 | 8.5 | 316 | 90 |
| GBM396-6 | 0.0774 | 1.3903 | 0.0083 | . | 0.0260 | 5.4 | 541 | . |
| GBM313-1 | 0.0738 | 0.3079 | 0.0015 | . | 0.1170 | 4.9 | 26 | 10 |
| GBM913-7 | 0.0633 | 0.7990 | 0.0010 | . | 0.0431 | 7.0 | 2052 | 17 |
| GBM316-2 | 0.0626 | 0.1523 | 0.0041 | . | 0.1331 | 3.2 | 82 | 35 |
| GBM910-7 | 0.0592 | 0.5335 | 0.0117 | . | 0.1249 | 7.1 | 80 | 86 |
| GBM323-12 | 0.0580 | 0.7868 | 0.0010 | 6.44 | 0.0421 | 6.9 | . | . |
| GBM314-2 | 0.0532 | 0.0419 | 0.0029 | . | 0.0975 | 3.3 | 4912 | 7 |
| GBM320-1 | 0.0527 | 0.0872 | 0.0023 | . | 0.0486 | 1.9 | 657 | 7 |
| GBM919-9 | 0.0520 | 0.1526 | 0.0069 | . | 0.5198 | 6.0 | 98 | 44 |
| GBM319-4 | 0.0505 | 0.1756 | 0.0017 | . | 0.1791 | 3.3 | 390 | 95 |
| GBM913-1 | 0.0477 | 0.3964 | 0.0005 | . | 0.0787 | 10.0 | 705 | 9 |
| GBM320-10 | 0.0476 | 0.1531 | 0.0563 | . | 0.1139 | 6.2 | 142 | 45 |
| GBM900-2 | 0.0464 | 0.0859 | 0.0886 | . | 0.0334 | 1.3 | 786 | 61 |
| GBM908-6 | 0.0461 | 0.0441 | 0.4736 | . | 0.1354 | 1.2 | 14 | 832 |
| GBM918-4 | 0.0439 | 0.3948 | 0.0128 | . | 0.0387 | 1.1 | 204 | 19 |
| GBM922-9 | 0.0436 | 0.7535 | 0.0027 | . | 0.0037 | 4.9 | 257 | 49 |
| GBM305-4 | 0.0416 | 0.1138 | 0.0475 | . | 0.1199 | 2.6 | 263 | 70 |
| GBM913-9 | 0.0404 | 0.4542 | 0.0006 | . | 0.0158 | 3.8 | 611 | 13 |
| GBM907-8 | 0.0388 | 0.0339 | 0.4295 | . | 0.1234 | 1.0 | 11 | 219 |
| GBM318-2 | 0.0373 | 0.2149 | 0.0026 | . | 0.2103 | 3.5 | 573 | 535 |
| GBM317-2 | 0.0338 | 0.7414 | 0.0011 | . | 0.2356 | 7.4 | 166 | 388 |
| GBM996-4 | 0.0336 | 0.0492 | 0.0036 | . | 0.0968 | 3.6 | 442 | . |
| GBM323-14 | 0.0317 | 6.1400 | 4.7118 | 7.33 | 0.0098 | 66.5 | . | . |
| GBM917-4 | 0.0305 | 6.1310 | 4.7052 | . | 0.0090 | 65.7 | 2.04% | 1.16% |
| GBM913-10 | 0.0300 | 0.3019 | 0.0007 | . | 0.0380 | 3.0 | 823 | 10 |
| GBM913-4 | 0.0291 | 0.1556 | 0.0104 | . | 0.0282 | 2.0 | 255 | 193 |
| GBM906-6 | 0.0288 | 0.0171 | 0.0013 | . | 0.0210 | 392.8 | 10 | 8 |
| GBM916-10 | 0.0282 | 0.2393 | 0.0011 | . | 0.1235 | 4.5 | 135 | 319 |
| GBM323-10 | 0.0272 | 0.1360 | 0.2587 | . | 0.0317 | 1.1 | 57 | 158 |
| GBM322-9 | 0.0258 | 0.1457 | 0.1765 | . | 0.0696 | 3.2 | 936 | 50 |
| GBM919-7 | 0.0246 | 0.1250 | 0.1954 | . | 0.0226 | 3.6 | 288 | 85 |
| GBM322-7 | 0.0245 | 0.0089 | 0.0060 | . | 0.0924 | 1.6 | 176 | 24 |
| GBM302-5 | 0.0239 | 0.1059 | 0.0498 | . | 0.0359 | 1.8 | 1873 | 50 |
| GBM313-3 | 0.0239 | 0.0875 | 0.0256 | . | 0.1012 | 4.0 | 1039 | 37 |
| GBM316-10 | 0.0223 | 0.4554 | 0.0006 | . | 0.0178 | 1.3 | 179 | 8 |
| GBM300-7 | 0.0219 | 0.045 | 0.0013 | . | 0.0163 | 153.8 | 9 | 9 |
| GBM318-1 | 0.0215 | 0.1187 | 0.0031 | . | 0.1061 | 3.2 | 329 | 243 |
| GBM917-1 | 0.0209 | 0.0079 | 0.0017 | . | 0.1646 | 1.0 | 384 | 15 |
| GBM913-6 | 0.0207 | 0.3321 | 0.0004 | . | 0.0029 | 0.5 | 1104 | 6 |
| GBM907-11 | 0.0191 | 0.3873 | 4.5163 | 7.56 | 0.1033 | 4.7 | . | . |
| GBM397-8 | 0.0189 | 0.1419 | 0.1320 | . | 0.0363 | 1.5 | 553 | . |
| GBM922-12 | 0.0184 | 1.3975 | 2.0429 | 6.90 | 0.3402 | 4.4 | . | . |
| GBM914-2 | 0.0175 | 0.1824 | 0.0099 | . | 0.0626 | 5.9 | 9 | 26 |
| GBM321-6 | 0.0157 | 0.0051 | 0.0052 | . | 0.2169 | 2.9 | 340 | 20 |
| GBM916-5 | 0.0149 | 0.7006 | 0.0005 | . | 0.0268 | 2.3 | 22 | 10 |
| GBM921-9 | 0.0149 | 0.1248 | 0.0214 | . | 0.0632 | 5.9 | 394 | 36 |
| GBM917-5 | 0.0148 | 2.5667 | 2.1664 | . | 0.0042 | 29.3 | 9335 | 0.51% |
| GBM310-5 | 0.0140 | 0.0335 | 0.3691 | . | 0.0483 | 0.5 | 12 | 247 |
| GBM323-3 | 0.0137 | 0.0055 | 0.0060 | . | 0.0570 | 3.5 | 113 | 31 |
| GBM915-1 | 0.0135 | 0.0485 | 0.0176 | . | 0.0513 | 7.2 | 246 | 89 |
| GBM305-3 | 0.0135 | 0.0451 | 0.0272 | . | 0.0372 | 1.7 | 656 | 46 |
| GBM311-7 | 0.0134 | 0.0947 | 0.0126 | . | 0.0452 | 2.0 | 830 | 28 |
| GBM321-3 | 0.0132 | 0.0050 | 0.0044 | . | 0.0775 | 5.9 | 635 | 19 |
| GBM914-1 | 0.0118 | 0.1152 | 0.0069 | . | 0.0427 | 4.8 | 6 | 24 |
| GBM922-5 | 0.0118 | 0.0580 | 0.2552 | . | 0.0110 | 0.6 | 228 | 49 |
| GBM323-6 | 0.0112 | 0.5353 | 0.0036 | . | 0.0388 | 1.8 | 39 | 72 |
| GBM313-4 | 0.0110 | 0.0342 | 0.0250 | . | 0.0337 | 2.7 | 385 | 33 |
| GBM908-1 | 0.0110 | 0.0074 | 0.0053 | . | 0.0102 | 1.7 | 10 | 34 |
| GBM323-8 | 0.0107 | 0.1491 | 0.0063 | . | 0.0696 | 0.9 | 6 | 26 |
| GBM323-7 | 0.0104 | 0.2993 | 0.0299 | . | 0.0371 | 2.4 | 1137 | 36 |
| GBM319-2 | 0.0101 | 0.0155 | 0.0109 | . | 0.0101 | 0.3 | 65 | 88 |
| GBM919-5 | 0.0100 | 0.1670 | 0.2419 | . | 0.0172 | 0.6 | 10 | 83 |
| GBM399-4 | 0.0097 | 0.0989 | 0.0054 | . | 0.0057 | 0.8 | 15 | 15 |
| GBM914-5 | 0.0094 | 1.2970 | 0.0210 | . | 0.0592 | 4.1 | 43 | 40 |
| GBM305-2 | 0.0091 | 0.0054 | 0.0045 | . | 0.0080 | 1.2 | 2 | 27 |
| GBM904-9 | 0.009 | 0.0351 | 0.1122 | . | 0.0287 | 1.8 | 6474 | 117 |
| GBM323-4 | 0.0089 | 0.1540 | 0.0027 | . | 0.5232 | 6 | 94 | 27 |
| GBM915-5 | 0.0087 | 0.0307 | 0.0106 | . | 0.0333 | 3.9 | 128 | 61 |
| GBM314-12 | 0.0077 | 2.9880 | 0.0127 | 7.79 | 0.5516 | 3.1 | . | . |
| GBM903-10 | 0.0074 | 0.0198 | 0.0559 | . | 0.0140 | 1.2 | 2779 | 57 |
| GBM319-10 | 0.0075 | 0.0122 | 0.0006 | . | 0.0831 | 1.1 | 2196 | 3 |
| GBM918-1 | 0.0075 | 0.0094 | 0.0066 | . | 0.0166 | 0.3 | 18 | 54 |
| Number | Pb% | Cu% | Ni% | S% | Zn% | Ag* | As* | Co* |

## CRM MULTI-METAL ORE

10 or 250 g units

| Number | Pb% | Cu% | Ni% | S% | Zn% | Ag* | As* | Co* |
|---|---|---|---|---|---|---|---|---|
| GBM305-6 | 0.0069 | 0.0242 | 0.0062 | . | 0.0120 | 1.5 | 315 | 31 |
| GBM315-5 | 0.0067 | 0.0045 | 0.0005 | . | 0.0154 | 14.8 | 72 | 9 |
| GBM918-2 | 0.0065 | 0.0081 | 0.0072 | . | 0.0101 | 0.2 | 22 | 29 |
| GBM921-3 | 0.0063 | 0.0038 | 0.0045 | . | 0.0476 | 1.6 | 100 | 19 |
| GBM321-5 | 0.0059 | 0.0157 | 0.0027 | . | 0.1495 | 1 | 89 | 18 |
| GBM321-15 | 0.0058 | 1.5473 | 2.3789 | 24.07 | 0.0105 | 3.5 | . | . |
| GBM320-2 | 0.0056 | 0.0117 | 0.0005 | . | 0.0012 | 27.1 | 42 | 4 |
| GBM919-6 | 0.0055 | 0.2756 | 0.5208 | . | 0.0218 | 1.9 | 591 | 358 |
| GBM921-6 | 0.0054 | 0.0131 | 0.0025 | . | 0.0648 | 1.3 | 95 | 17 |
| GBM321-14 | 0.0053 | 0.2756 | 0.5120 | 1.78 | 0.0206 | 1.8 | . | . |
| GBM922-6 | 0.0052 | 0.0308 | 0.0024 | . | 0.0679 | 2.9 | 33 | 13 |
| GBM915-6 | 0.0050 | 0.0186 | 0.0068 | . | 0.0225 | 2.1 | 63 | 47 |
| GBM914-7 | 0.0050 | 0.0034 | 0.0005 | . | 0.0084 | 8.8 | 49 | 9 |
| GBM903-7 | 0.0049 | 0.0313 | 0.0021 | . | 0.0669 | 3.0 | 33 | 12 |
| GBM321-13 | 0.0047 | 0.5959 | 0.4318 | 0.74 | 0.0032 | 6.4 | . | . |
| GBM997-9 | 0.0047 | 0.0485 | 0.0016 | . | 0.0016 | 0.9 | 5 | . |
| GBM914-3 | 0.0046 | 0.1441 | 0.0010 | . | 0.0193 | 1.2 | 34 | 34 |
| GBM320-11 | 0.0045 | 1.6875 | 0.0253 | 20.4 | 0.0113 | 5.9 | . | . |
| GBM900-4 | 0.0044 | 0.1032 | 0.1294 | . | 0.0087 | 1.5 | 2448 | 67 |
| GBM914-15 | 0.0044 | 0.0060 | 1.5093 | 0.06 | 0.0354 | 0.6 | . | . |
| GBM316-3 | 0.0043 | 0.0019 | 0.0011 | . | 0.0048 | 0.2 | 5 | 8 |
| GBM915-8 | 0.0042 | 0.5897 | 0.4259 | . | 0.0025 | 6.6 | 1873 | 1083 |
| GBM914-4 | 0.0042 | 0.0864 | 0.0006 | . | 0.0202 | 0.8 | 13 | 15 |
| GBM922-7 | 0.0039 | 0.0123 | 0.1199 | . | 0.0271 | 0.3 | 755 | 163 |
| GBM919-10 | 0.0039 | 0.0114 | 0.0609 | . | 0.0066 | 0.6 | 583 | 23 |
| GBM321-7 | 0.0037 | 0.1518 | 0.0012 | . | 0.0300 | 2.7 | 101 | 21 |
| GBM910-10 | 0.0037 | 0.0033 | 0.0013 | . | 0.0051 | 0.5 | 2 | 9 |
| GBM907-2 | 0.0036 | 0.099 | 0.0031 | . | 0.0097 | 11 | 41 | 58 |
| GBM904-10 | 0.0035 | 0.0162 | 0.2709 | . | 0.0039 | 0.5 | 35 | 59 |
| GBM906-9 | 0.0035 | 0.0094 | 0.0071 | . | 0.0079 | 4.0 | 50 | 20 |
| GBM922-8 | 0.0035 | 0.0040 | 0.0033 | . | 0.0058 | 0.3 | 14 | 27 |
| GBM917-2 | 0.0035 | 0.0031 | 0.0009 | . | 0.0121 | 10.3 | 57 | 5 |
| GBM307-5 | 0.0034 | 0.0031 | 0.0029 | . | 0.0018 | 1.0 | 23 | 4 |
| GBM308-3 | 0.0033 | 0.0928 | 0.0036 | . | 0.0109 | 14.5 | 41 | 63 |
| GBM323-9 | 0.0032 | 0.0490 | 0.0023 | . | 0.0102 | 4.2 | 4 | 22 |
| GBM912-16 | 0.0031 | 0.3442 | 3.7560 | 11.51 | 0.0107 | 1.9 | . | . |
| GBM904-5 | 0.0031 | 0.1111 | 0.0039 | . | 0.0026 | 0.8 | 108 | 155 |
| GBM915-3 | 0.0031 | 0.0132 | 0.0051 | . | 0.0171 | 1.1 | 33 | 40 |
| GBM916-1 | 0.0031 | 0.0017 | 0.0012 | . | 0.0045 | 0.4 | 6 | 9 |
| GBM310-8 | 0.0029 | 0.0396 | 0.0028 | . | 0.0027 | 0.5 | 85 | 50 |
| GBM313-10 | 0.0029 | 0.0268 | 0.0025 | . | 0.0086 | 3.2 | 3 | 22 |
| GBM321-4 | 0.0029 | 0.0254 | 0.0039 | . | 0.0753 | 1.4 | 100 | 21 |
| GBM322-3 | 0.0029 | 0.0214 | 0.0177 | . | 0.0142 | 1.5 | 139 | 49 |
| GBM911-5 | 0.0029 | 0.0042 | 0.0020 | . | 0.0060 | 0.8 | 6 | 15 |
| GBM314-7 | 0.0029 | 0.0026 | 0.0014 | . | 0.0047 | 0.4 | 4 | 9 |
| GBM305-1 | 0.0029 | 0.0175 | 0.0351 | . | 0.0217 | 0.6 | 795 | 46 |
| GBM301-7 | 0.0028 | 0.5578 | 0.0029 | . | 0.0148 | 1.8 | 14 | 14 |
| GBM399-2 | 0.0028 | 0.0205 | 0.0014 | . | 0.0309 | 0.7 | 4 | 3 |
| GBM311-9 | 0.0028 | 0.0124 | 0.0306 | . | 0.0072 | 0.7 | 3 | 34 |
| GBM917-3 | 0.0028 | 0.0054 | 0.0005 | . | 0.0175 | 4.8 | 42 | 18 |
| GBM912-3 | 0.0028 | 0.0026 | 0.0013 | . | 0.0041 | 0.4 | 2 | 8 |
| GBM315-3 | 0.0027 | 0.1205 | 0.0021 | . | 0.0077 | 2.6 | 4 | 19 |
| GBM912-6 | 0.0027 | 0.0273 | 0.0021 | . | 0.0076 | 3.2 | 3 | 18 |
| GBM914-11 | 0.0027 | 0.0093 | 0.7245 | 0.07 | 0.0135 | 0.6 | . | . |
| GBM322-5 | 0.0022 | 0.0152 | 0.0019 | . | 0.0096 | 1.6 | 3456 | 15 |
| GBM320-16 | 0.0022 | 0.0049 | 3.8993 | 0.05 | 0.0076 | 4.6 | . | . |
| GBM919-4 | 0.0022 | 0.0039 | 0.0025 | . | 0.0076 | 12.4 | 2 | 22 |
| GBM918-7 | 0.0022 | 0.0018 | 0.0030 | . | 0.0019 | 0.4 | 4 | 2 |
| GBM319-9 | 0.0021 | 0.0109 | 0.0045 | . | 0.0714 | 0.7 | 273 | 18 |
| GBM906-4 | 0.0021 | 0.0372 | 0.0089 | . | 0.0145 | 0.8 | 62 | 29 |
| GBM314-3 | 0.0021 | 0.0287 | 0.0008 | . | 0.0249 | 6.9 | 400 | 7 |
| GBM908-4 | 0.0021 | 0.0041 | 0.0026 | . | 0.0085 | 1.9 | 7 | 18 |
| GBM914-6 | 0.0020 | 0.4720 | 0.0041 | . | 0.0093 | 6.5 | 4 | 25 |
| GBM321-1 | 0.0020 | 0.1034 | 0.0044 | . | 0.0085 | 0.8 | 27 | 15 |
| GBM922-10 | 0.0020 | 0.0065 | 0.0683 | . | 0.0031 | 0.3 | 477 | 59 |
| GBM920-15 | 0.0020 | 0.0051 | 0.9839 | 0.08 | 0.0329 | 0.9 | . | . |
| GBM913-3 | 0.0020 | 0.0034 | 0.0013 | . | 0.0051 | 0.6 | 5 | 12 |
| GBM321-2 | 0.0019 | 0.1176 | 0.0050 | . | 0.0217 | 2.1 | 70 | 34 |
| GBM312-10 | 0.0019 | 0.0040 | 0.0022 | . | 0.0067 | 10.1 | 2 | 19 |
| GBM313-5 | 0.0019 | 0.0036 | 0.0022 | . | 0.0067 | 1.6 | 5 | 19 |
| GBM918-5 | 0.0018 | 0.1523 | 0.4960 | . | 0.1021 | 6.9 | 36 | 282 |
| GBM908-2 | 0.0018 | 0.0056 | 0.0026 | . | 0.0070 | 7.2 | 3 | 21 |
| GBM315-6 | 0.0018 | 0.0045 | 0.0027 | . | 0.0091 | 1.3 | 2 | 25 |
| GBM313-6 | 0.0018 | 0.0037 | 0.0022 | . | 0.0066 | 3.0 | 6 | 19 |
| GBM312-1 | 0.0017 | 0.0011 | 0.0008 | . | 0.0008 | 0.8 | 17 | 2 |
| GBM907-5 | 0.0017 | 0.0078 | 0.0026 | . | 0.0092 | 12.8 | 5 | 23 |
| GBM913-2 | 0.0017 | 0.0011 | 0.0004 | . | 0.0009 | 0.9 | 22 | 2 |
| GBM316-4 | 0.0017 | 0.0010 | 0.0008 | . | 0.0007 | 0.5 | 23 | 2 |
| GBM322-4 | 0.0016 | 0.1025 | 0.0032 | . | 0.0107 | 2.3 | 171 | 26 |
| GBM922-3 | 0.0016 | 0.0602 | 0.0032 | . | 0.0122 | 1.5 | 89 | 23 |
| GBM918-9 | 0.0016 | 0.0021 | 0.0922 | . | 0.0040 | 0.5 | 20 | 100 |
| GBM322-11 | 0.0015 | 1.4752 | 0.0029 | 0.70 | 1.3941 | 1 | . | . |
| GBM315-4 | 0.0015 | 0.1179 | 0.0068 | . | 0.0089 | 0.8 | 10 | 17 |
| GBM316-8 | 0.0015 | 0.3175 | 0.0832 | . | 0.0330 | 18.7 | 426 | 57 |
| GBM997-5 | 0.0015 | 0.0328 | 0.6258 | . | 0.0085 | 1.3 | 125 | . |
| GBM921-4 | 0.0015 | 0.0030 | 0.0021 | . | 0.0108 | 0.4 | 34 | 11 |
| GBM314-13 | 0.0014 | 0.5356 | 9.5073 | 0.65 | 0.0095 | 4.4 | . | . |
| GBM916-6 | 0.0014 | 0.3599 | 0.1005 | . | 0.0330 | 21.1 | 497 | 62 |
| GBM318-9 | 0.0014 | 0.1076 | 0.0069 | . | 0.0087 | 0.9 | 22 | 15 |
| GBM323-2 | 0.0014 | 0.0473 | 0.0027 | . | 0.0126 | 1 | 58 | 23 |
| GBM320-3 | 0.0013 | 0.2718 | 0.0829 | . | 0.0254 | 11.5 | 309 | 55 |
| GBM916-4 | 0.0013 | 0.1842 | 0.0913 | . | 0.0248 | 10.9 | 287 | 53 |
| GBM918-8 | 0.0013 | 0.1662 | 0.0853 | . | 0.0241 | 9.2 | 277 | 55 |
| GBM921-2 | 0.0013 | 0.0888 | 0.0055 | . | 0.0074 | 0.7 | 24 | 16 |
| GBM318-10 | 0.0013 | 0.0872 | 0.0058 | . | 0.0077 | 0.7 | 33 | 15 |
| GBM999-6 | 0.0013 | 0.0639 | 0.0219 | . | 0.0087 | 0.9 | 13 | 23 |
| GBM302-4 | 0.0013 | 0.0160 | 0.0118 | . | 0.0085 | 0.8 | 738 | 21 |
| GBM315-8 | 0.0013 | 0.0062 | 0.0034 | . | 0.0106 | 4.8 | 3 | 32 |
| GBM320-8 | 0.0012 | 0.6686 | 0.0020 | . | 0.0121 | 2.7 | 3 | 31 |
| GBM919-1 | 0.0012 | 0.3723 | 0.0019 | . | 0.0132 | 2.3 | 2 | 29 |
| GBM313-11 | 0.0012 | 0.1168 | 0.0054 | 0.23 | 0.0075 | 1.7 | . | . |
| GBM921-1 | 0.0012 | 0.0913 | 0.0055 | . | 0.0083 | 0.8 | 17 | 16 |
| GBM317-1 | 0.0012 | 0.0626 | 0.0062 | . | 0.0077 | 0.6 | 100 | 21 |
| GBM922-4 | 0.0012 | 0.0067 | 0.0018 | . | 0.0052 | 0.5 | 738 | 7 |
| GBM908-3 | 0.0012 | 0.0054 | 0.0025 | . | 0.0098 | 4.8 | 6 | 26 |
| GBM322-2 | 0.0011 | 1.4869 | 0.0028 | . | 1.3776 | 0.5 | 45 | 2061 |
| GBM397-2 | 0.0011 | 0.0089 | 0.0086 | . | 0.0087 | 1.7 | 2361 | . |
| Number | Pb% | Cu% | Ni% | S% | Zn% | Ag* | As* | Co* |

more ores on the next page

## CRM MULTI-METAL ORE

10 or 250 g units

| Number | Pb% | Cu% | Ni% | S% | Zn% | Ag* | As* | Co* |
|---|---|---|---|---|---|---|---|---|
| GBM316-6 | 0.0011 | 0.701 | 0.0003 | . | 0.0045 | 0.5 | 3 | 8 |
| GBM919-3 | 0.0011 | 0.6054 | 0.0019 | . | 0.0117 | 3.6 | 2 | 31 |
| GBM916-8 | 0.0011 | 0.2692 | 0.0772 | . | 0.0095 | 0.4 | 30 | 52 |
| GBM318-6 | 0.0011 | 0.2446 | 0.0819 | . | 0.0204 | 6.9 | 200 | 53 |
| GBM920-5 | 0.0011 | 0.0773 | 0.0047 | . | 0.0065 | 0.5 | 22 | 14 |
| GBM922-1 | 0.0011 | 0.0184 | 0.0059 | . | 0.0207 | 0.8 | 76 | 26 |
| GBM320-7 | 0.0010 | 0.4445 | 0.0021 | . | 0.0097 | 2.7 | 3 | 73 |
| GBM318-5 | 0.0010 | 0.2993 | 0.0827 | . | 0.0127 | 4.7 | 179 | 56 |
| GBM320-6 | 0.0010 | 0.2702 | 0.0021 | . | 0.0043 | 1.4 | 3 | 37 |
| GBM919-2 | 0.0010 | 0.1592 | 0.0015 | . | 0.0039 | 0.8 | 3 | 41 |
| GBM916-3 | 0.0010 | 0.1293 | 0.0048 | . | 0.0079 | 1.0 | 12 | 14 |
| GBM918-10 | 0.0010 | 0.0992 | 0.0038 | . | 0.0077 | 0.8 | 14 | 13 |
| GBM914-9 | 0.0010 | 0.0952 | 0.0058 | . | 0.0070 | 0.8 | 10 | 15 |
| GBM920-6 | 0.0010 | 0.0760 | 0.0056 | . | 0.0075 | 0.7 | 30 | 16 |
| GBM317-3 | 0.0010 | 0.0736 | 0.0066 | . | 0.0071 | 0.7 | 17 | 17 |
| GBM316-9 | 0.0010 | 0.0710 | 0.0003 | . | 0.0040 | 0.5 | 3 | 7 |
| GBM300-9 | 0.0010 | 0.0317 | 0.3765 | . | 0.0084 | 0.8 | 11 | 182 |
| GBM300-4 | 0.0010 | 0.0266 | 0.8118 | . | 0.0098 | 0.7 | 18 | 258 |
| GBM921-5 | 0.0010 | 0.0558 | 0.0032 | . | 0.0098 | 2.6 | 156 | 24 |
| GBM904-1 | 0.001 | 0.0077 | 0.0035 | . | 0.0092 | 0.6 | 7 | 28 |
| GBM920-4 | 0.0009 | 0.2746 | 0.0719 | . | 0.0085 | 0.4 | 35 | 47 |
| GBM320-5 | 0.0009 | 0.1259 | 0.0021 | . | 0.0037 | 0.6 | 2 | 57 |
| GBM323-1 | 0.0009 | 0.0702 | 0.0033 | . | 0.0099 | 1.2 | 178 | 22 |
| GBM322-1 | 0.0008 | 0.0868 | 0.0048 | . | 0.0066 | 0.6 | 4 | 14 |
| GBM922-2 | 0.0008 | 0.0256 | 0.0034 | . | 0.0091 | 0.8 | 67 | 24 |
| GBM322-6 | 0.0007 | 0.0794 | 0.0030 | . | 0.0075 | 1.3 | 241 | 26 |
| GBM920-9 | 0.0006 | 0.0020 | 0.0014 | . | 0.0039 | 50.9 | 2 | 10 |
| GBM900-8 | 0.0010 | 0.0046 | 3.8468 | . | 0.0053 | 4.7 | 8 | 50 |
| GBM320-4 | 0.0009 | 0.3238 | 0.0743 | . | 0.0090 | 0.5 | 32 | 49 |
| GBM320-5 | 0.0009 | 0.1259 | 0.0021 | . | 0.0037 | 0.6 | 2 | 57 |
| GBM901-4 | 0.0009 | 0.0946 | 0.0018 | . | 0.0069 | 0.7 | 6 | 21 |
| GBM910-15 | 0.0009 | 0.0381 | 0.5621 | 0.1 | 0.0062 | 1.1 | . | . |
| GBM397-9 | 0.0009 | 0.0059 | 0.0042 | . | 0.0073 | 0.9 | 11 | . |
| GBM998-9 | 0.0009 | 0.0023 | 0.0013 | . | 0.0027 | 101.9 | 7 | 8 |
| GBM307-2 | 0.0009 | 0.0089 | 0.0034 | . | 0.0094 | 0.5 | 8 | 31 |
| GBM314-6 | 0.0008 | 0.4290 | 0.0072 | . | 0.0117 | 0.6 | 14 | 205 |
| GBM916-7 | 0.0008 | 0.3170 | 0.0769 | . | 0.0090 | 0.3 | 31 | 49 |
| GBM316-7 | 0.0008 | 0.2742 | 0.0849 | . | 0.0077 | 0.5 | 44 | 52 |
| GBM907-9 | 0.0008 | 0.0365 | 0.5442 | . | 0.0053 | 0.8 | 12 | 305 |
| GBM906-7 | 0.0008 | 0.0362 | 0.5562 | . | 0.0051 | 0.9 | 25 | 210 |
| GBM305-5 | 0.0008 | 0.0194 | 0.1785 | . | 0.0056 | 0.5 | 67 | 51 |
| GBM998-5 | 0.0008 | 0.0056 | 0.0025 | . | 0.0084 | 0.6 | 10 | 28 |
| GBM910-8 | 0.0008 | 0.0055 | 0.0024 | . | 0.0087 | 0.7 | 5 | 28 |
| GBM307-4 | 0.0007 | 0.0059 | 0.0025 | . | 0.0077 | 3.9 | 6 | 25 |
| GBM915-2 | 0.0007 | 0.0065 | 0.0036 | . | 0.0119 | 9.9 | 8 | 37 |
| GBM314-10 | 0.0006 | 0.0061 | 0.0036 | . | 0.0121 | 0.7 | 4 | 39 |
| GBM313-8 | 0.0006 | 0.0058 | 0.0035 | . | 0.0114 | 0.4 | 2 | 36 |
| GBM910-9 | 0.0006 | 0.0055 | 0.0023 | . | 0.0081 | 0.5 | 2 | 27 |
| GBM911-8 | 0.0006 | 0.0055 | 0.0023 | . | 0.0088 | 0.7 | 4 | 27 |
| GBM918-6 | 0.0005 | 0.0478 | 0.1437 | . | 0.0370 | 1.4 | 12 | 71 |
| GBM912-4 | 0.0005 | 0.0054 | 0.0025 | . | 0.0084 | 0.4 | 3 | 26 |
| GBM318-3 | 0.0005 | 0.0054 | 0.9874 | . | 0.0327 | 0.5 | 3 | 807 |
| GBM318-7 | 0.0002 | 0.0003 | 0.0002 | . | 0.0002 | 0.1 | 2 | 1 |
| GBM316-5 | 0.0004 | 0.0057 | 0.0036 | . | 0.0114 | 0.4 | 1 | 37 |
| Number | Pb% | Cu% | Ni% | S% | Zn% | Ag* | As* | Co* |

## NICKEL ORE

listed in mass % except * which is mg/kg GBM: CRM, 10 or 250g IGS, NCS: CRM, 50g JSM: RM, 50g

| Number | Ni | Cd | Co | Cr | Cu | Fe | Mn | Pb | S | Zn | Ag* | $Al_2O_3$ | CaO | MgO | P | $SiO_2$ | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBM909-15 | 11.5901 | . | . | . | 1.3120 | . | . | 0.2120 | 26.7 | 2.6608 | 13.5 | . | . | . | . | . | . |
| NCS DC28072 | 5.71 | 0.047 | 0.042 | 0.015 | 0.270 | 23.73 | 0.037 | 0.040 | 2.51 | 4.65 | . | 3.91 | 6.47 | 1.14 | 1.61 | 21.10 | 0.15 |
| NCS DC28079 | 3.98 | 0.028 | 0.041 | 0.364 | 0.169 | 20.74 | 0.147 | 0.030 | 1.41 | 2.85 | . | 3.55 | 4.54 | 8.67 | 1.08 | 27.48 | 0.098 |
| GBM911-14 | 3.2361 | . | . | . | 0.2856 | . | . | 0.0091 | 10.5 | 0.0180 | 1.7 | . | . | . | . | . | . |
| GBM910-13 | 2.6969 | . | . | . | 0.2306 | . | . | 0.0034 | 8.2 | 0.0152 | 1.9 | . | . | . | . | . | . |
| GBM911-15 | 2.2856 | . | . | . | 0.5003 | . | . | 0.0253 | 8.1 | 0.0288 | 2.9 | . | . | . | . | . | . |
| JSM 0800-1 | 2.27 | . | 0.053 | 0.70 | . | 14.2 | . | . | . | . | . | 0.98 | 0.030 | 26.2 | . | 35.7 | . |
| NCS DC28078 | 2.18 | (<0.0015) | 0.055 | 0.76 | 0.0058 | 14.89 | 0.254 | 0.0020 | 0.034 | 0.079 | . | 1.59 | 0.46 | 21.28 | 0.029 | 39.20 | 0.027 |
| JSM 0800-2 | 2.07 | . | 0.036 | 0.57 | . | 11.5 | . | . | . | . | . | 1.27 | 0.37 | 23.3 | . | 45.4 | . |
| GBM915-12 | 2.0155 | . | . | . | 0.9137 | . | . | 0.0051 | 6.35 | 0.0573 | 2.5 | . | . | . | . | . | . |
| GBM307-13 | 1.9995 | . | . | . | 0.1251 | . | . | 0.0045 | 6.78 | 0.0117 | . | . | . | . | . | . | . |
| NCS DC28077 | 1.97 | (<0.0015) | 0.060 | 0.823 | 0.0016 | 14.84 | 0.263 | 0.0015 | 0.016 | 0.021 | . | 1.03 | 0.14 | 25.49 | 0.0043 | 36.00 | 0.017 |
| IGS 21 | 1.97 | . | 0.069 | . | 0.798 | 23.40 | . | . | . | . | . | . | . | . | . | . | . |
| JSM 0800-3 | 1.90 | . | 0.072 | 0.84 | . | 15.0 | . | . | . | . | . | 0.84 | 0.034 | 26.1 | . | 34.9 | . |
| NCS DC28076 | 1.86 | (<0.0015) | 0.065 | 0.92 | 0.0017 | 15.20 | 0.282 | 0.0016 | 0.016 | 0.021 | . | 1.04 | 0.10 | 25.70 | (<0.007) | 34.70 | 0.015 |
| NCS DC28075 | 1.70 | (<0.0015) | 0.043 | 0.80 | 0.0025 | 14.92 | 0.294 | 0.0013 | 0.014 | 0.019 | . | 2.00 | 0.385 | 21.05 | 0.0043 | 38.77 | 0.039 |
| GBM921-15 | 1.6906 | . | . | . | 0.0057 | . | . | 0.0033 | 0.45 | 0.0249 | 0.6 | . | . | . | . | . | . |
| GBM919-14 | 1.6566 | . | . | . | 0.0288 | . | . | 0.0361 | 2.90 | 0.1391 | 1.1 | . | . | . | . | . | . |
| GBM309-6 | 1.6113 | . | 0.0909 | . | 0.0277 | . | . | 0.0341 | . | 0.1344 | 1.2 | . | As:0.0018 | . | . | . | . |
| NCS DC28080 | 1.30 | (<0.0025) | 0.033 | 1.38 | 0.0071 | 34.55 | 0.192 | 0.0019 | 0.180 | 0.022 | . | 6.53 | 0.070 | 10.54 | 0.020 | 15.48 | 0.092 |
| GBM318-8 | 1.2863 | . | 0.3258 | . | 1.7336 | . | . | 0.0097 | . | 0.0035 | 18.5 | . | As:0.5606 | . | . | . | . |
| GBM323-15 | 1.2702 | . | . | . | 0.0055 | . | . | 0.0012 | 0.10 | 0.0237 | 1.1 | . | . | . | . | . | . |
| GBM316-15 | 1.2308 | . | . | . | 0.0056 | . | . | 0.0022 | 0.10 | 0.0257 | 1.0 | . | . | . | . | . | . |
| NCS DC28073 | 1.17 | (<0.0015) | 0.042 | 0.95 | 0.0049 | 18.57 | 0.327 | 0.0024 | 0.024 | 0.019 | . | 2.90 | 0.82 | 20.75 | (<0.007) | 37.41 | 0.024 |
| GBM922-11 | 1.1664 | . | . | . | 0.0016 | . | . | 0.0014 | 0.03 | 0.0145 | 0.6 | . | . | . | . | . | . |
| GBM919-15 | 1.1621 | . | . | . | 0.0158 | . | . | 0.0111 | 0.81 | 0.0670 | 1.6 | . | . | . | . | . | . |
| NCS DC28074 | 0.892 | (<0.0020) | 0.014 | 1.84 | 0.012 | 46.99 | 0.149 | 0.0023 | 0.288 | 0.023 | . | 10.29 | 0.033 | 0.51 | 0.030 | 2.52 | 0.145 |
| GBM305-16 | 0.6503 | . | . | . | 0.0381 | . | . | 0.0026 | . | 0.0092 | . | . | . | . | . | . | . |
| Number | Ni | Cd | Co | Cr | Cu | Fe | Mn | Pb | S | Zn | Ag* | $Al_2O_3$ | CaO | MgO | P | $SiO_2$ | Ti |

## CRM NICKEL ORE

analysis in mg/kg except % which is mass %

| Number | Ag | Au | Cu% | Ir | Ni% | Os | Pd | Pt | Rh | Ru | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 1702-86 | 23.4 | 0.84 | (3) | 0.11 | 5.4 | 0.06 | 30.0 | 8.6 | 0.98 | 0.34 | 100 g |

## CRM NICKEL SULHPIDE ORE

analysis listed as mass % except ** for ppb, * indicates certified as element instead of oxide, much more detail on certificates, 10 or 60g units

| Number | Ni | Co | Fe | S | $Al_2O_3$ | As | Ca | Cr | Cu | K | MgO | Mn | Na | P | $SiO_2$ | Ti | Au** | Pd** | Pt** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 78 | 25.79 | 23.74 | . | 28.61 | . | . | . | . | . | . | . | . | . | . | . | . | LOI: (2.36) | | |
| OREAS 77b | 11.24 | 0.1604 | 29.21 | 22.29 | 1.86* | . | 3.11 | 0.0341 | 0.3163 | 0.344 | 2.67* | 0.068 | 0.406 | . | 9.24* | 0.065 | . | . | . |
| OREAS 77a | 10.71 | 0.1675 | 34.0 | 26.83 | 1.48 | 0.0162 | . | 0.0840 | 0.4400 | . | 7.27 | . | . | . | 13.3 | . | 61 | 566 | 1088 |
| OREAS 76b | 7.78 | 0.1103 | 21.76 | 15.18 | 2.58* | . | 3.115 | 0.0663 | . | 0.474 | 5.80* | 0.079 | 0.510 | 0.0139 | 13.74* | 0.103 | . | . | . |
| OREAS 76a | 7.40 | 0.1215 | 24.6 | 18.0 | 1.78 | 0.0117 | . | 0.1283 | 0.2974 | . | 16.5 | . | . | . | 21.7 | . | 41 | 403 | 701 |
| OREAS 75b | 5.38 | 0.0788 | 17.17 | 10.79 | 2.79* | . | 3.03 | 0.0942 | 0.1483 | 0.410 | 8.75* | 0.097 | . | 0.0187 | 15.67* | 0.139 | . | . | . |
| OREAS 75a | 5.25 | 0.0894 | 19.1 | 12.5 | 1.99 | 0.0080 | . | 0.1552 | 0.2005 | . | 22.3 | . | . | . | 27.3 | . | 34 | 280 | 353 |
| OREAS 74b | 3.39 | 0.0502 | 12.40 | 6.57 | 3.55* | . | 3.09 | 0.0981 | 0.0947 | 0.691 | 9.23* | . | 0.692 | 0.0195 | 19.36* | 0.1555 | . | . | . |
| ~~OREAS 74a~~ | ~~3.24~~ | ~~0.0581~~ | ~~13.7~~ | ~~7.48~~ | ~~2.21~~ | ~~0.00496~~ | ~~.~~ | ~~0.1780~~ | ~~0.1240~~ | ~~.~~ | ~~27.9~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~32.4~~ | ~~.~~ | ~~21~~ | ~~172~~ | ~~223~~ |
| ~~OREAS 14p~~ | ~~2.09~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.997~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~51~~ | ~~150~~ | ~~99~~ |
| OREAS 73b | 1.50 | 0.0246 | 8.63 | 2.90 | 3.77* | . | 3.15 | 0.1172 | 0.0430 | 0.586 | 11.80* | 0.115 | 0.736 | 0.024 | 20.89* | 0.191 | . | . | . |
| ~~OREAS 72b~~ | ~~0.709~~ | ~~0.0126~~ | ~~6.80~~ | ~~1.44~~ | ~~4.75*~~ | ~~.~~ | ~~2.83~~ | ~~0.0971~~ | ~~0.0193~~ | ~~1.09~~ | ~~9.61*~~ | ~~0.1004~~ | ~~0.958~~ | ~~0.0267~~ | ~~23.92*~~ | ~~0.213~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| ~~OREAS 70b~~ | ~~0.223~~ | ~~.~~ | ~~5.51~~ | ~~0.286~~ | ~~3.81*~~ | ~~.~~ | ~~3.07~~ | ~~0.1243~~ | ~~.~~ | ~~0.585~~ | ~~13.54*~~ | ~~0.115~~ | ~~.~~ | ~~0.024~~ | ~~22.42*~~ | ~~0.178~~ | ~~.~~ | ~~.~~ | ~~.~~ |

## RM NIOBIUM ORE

analysis listed in mass % 100g units

| Number | $Nb_2O_5$ | $Al_2O_3$ | BaO | $CO_2$ | CaO | $CeO_2$ | F | Fe | $K_2O$ | $La_2O_3$ | MgO | MnO | $Na_2O$ | $Nd_2O_3$ | $P_2O_5$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FQZ 1807 | 61.95 | 0.382 | 0.192 | 0.056 | 13.18 | 0.567 | 4.12 | 2.29 | 0.320 | 0.150 | 0.150 | 0.310 | 5.42 | 0.209 | 0.112 |
| DH X1803 | 60.62 | 0.291 | 0.201 | 0.097 | 13.02 | 0.556 | 3.65 | 3.50 | 0.233 | 0.153 | 0.136 | 0.325 | 5.28 | 0.207 | 0.102 |
| FQZ 1808 | 56.71 | 0.614 | 0.277 | 0.139 | 11.67 | 0.588 | 4.02 | 5.41 | 0.463 | 0.185 | 0.177 | 0.383 | 4.73 | 0.214 | 0.134 |
| DH X1806 | 0.095 | 0.945 | 0.046 | 36.82 | 27.77 | 0.086 | . | 5.44 | 0.525 | 0.040 | 16.16 | 1.12 | 0.061 | 0.038 | 1.75 |

continued

| Number | S | $SiO_2$ | SrO | $Ta_2O_5$ | $ThO_2$ | $TiO_2$ | $U_3O_8$ | $V_2O_5$ | $Y_2O_3$ | ZnO | $ZrO_2$ | $-H_2O$ 900'C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FQZ 1807 | 0.052 | 2.28 | 1.18 | 0.276 | 0.734 | 3.86 | 0.190 | 0.056 | 0.098 | 0.005 | 0.868 | 0.611 |
| DH X1803 | 0.051 | 1.91 | 1.20 | 0.273 | 0.770 | 4.26 | 0.202 | 0.073 | 0.085 | 0.001 | 0.847 | . |
| FQZ 1808 | 0.056 | 3.52 | 1.31 | 0.265 | 0.802 | 3.92 | 0.153 | 0.075 | 0.074 | 0.003 | 0.837 | 0.668 |
| DH X1806 | 0.798 | 3.38 | 0.274 | (0.001) | 0.010 | 0.089 | (0.002) | (0.009) | (0.009) | 0.013 | 0.027 | . |

## CRM NIOBIUM ORE

certified analysis — analysis listed in mass % — informational values — 200 g units

| Number | Nb | Al | Ca | Fe | K | Mg | Mn | Na | P | Pb | S | Si | Sr | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN OKA-1 | 0.37 | 0.9 | 31.3 | 2.8 | 0.3 | 1.3 | 1.1 | 0.2 | 1.1 | 1.1 | 0.6 | 2.4 | 1.0 | 0.05 | 31.9 |

## CRM NOBLE METAL ORE

analysis listed in mg/kg except % which is mass %

| Number | Ag | Au | Cu% | Fe% | Ir | Ni | Pd | Pt | Rh | Ru | S | $Al_2O_3$ | CaO | Co | $Cr_2O_3$ | MgO | $SiO_2$ | Units | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~CAN PTM-1a~~ | ~~(135)~~ | ~~3.30~~ | ~~.~~ | ~~.~~ | ~~(0.35)~~ | ~~.~~ | ~~10.01~~ | ~~7.31~~ | ~~(0.92)~~ | ~~(0.7)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~400 g~~ | |
| SARM 186 | . | 2.58 | 1.25 | 10.9 | 3.01 | 2.29 | 28.1 | 67.1 | 7.63 | 11.4 | (4.59) | . | . | 0.18 | . | . | Si:21.0 | 1 kg | |
| SARM 171 | . | 1.67 | 0.88 | (10.96) | (0.14) | 1.57 | 11.23 | 9.26 | 0.65 | (1.03) | 4.04 | . | . | (0.045) | . | . | Si(21.82) | 1 kg | |
| SARM 142 | . | 0.23 | (0.08) | . | (0.06) | (0.16) | 1.35 | 2.83 | 0.18 | 0.33 | . | . | . | . | (0.70) | . | . | 3 kg | |
| SARM 143 | . | 0.21 | (0.08) | . | (0.06) | (0.15) | 1.25 | 2.57 | 0.17 | 0.31 | . | . | . | . | (0.57) | . | . | 3 kg | |
| SARM 189 | . | 0.04 | . | . | (0.19) | . | 0.90 | 1.77 | 0.30 | (0.50) | (0.02) | 13.4 | (4.15) | . | 17.0 | 13.7 | 31.4 | 1 kg | |
| SARM 72 | . | 0.13 | (0.039) | 17.8 | (0.28) | 0.17 | 4.24 | 3.97 | 0.83 | 1.18 | 0.11 | (15.3) | (1.79) | (0.024) | 31 | 11.6 | 14.1 | 2.5 kg | last |
| SARM 75 | . | (0.053) | . | . | . | 0.23 | 0.61 | 0.32 | . | . | (0.39) | . | . | . | . | . | . | 3 kg | last |
| CAN WPR-1a | 1.02 | (0.05) | 0.299 | 11.34 | (0.02) | 0.439 | 0.614 | 0.452 | . | . | 1.768 | . | . | more data under Peridotite | | | | 400 g | |
| SARM 107 | . | 0.046 | . | . | (0.14) | . | 0.926 | 1.99 | 0.320 | 0.626 | . | . | . | . | . | . | . | 3 kg | |
| SARM 81 | . | (0.034) | . | . | (0.18) | . | 1.46 | 2.50 | 0.490 | (0.76) | . | . | . | . | . | . | . | 3 kg | last |
| CAN PTA-1 | . | . | . | . | . | . | . | 3.05 | . | . | . | . | . | . | . | . | . | 400 g | |

## CRM NOBLE METAL ORE - CERTIFIED BY ANALYTICAL METHOD

analysis listed in mg/kg  Ni = Nickel Sulfide, Pb = Lead Extraction  analysis listed in mass %  AR = Aqua Regia, M = M/ICP, X = XRF

| Number | Pd(Ni) | Pd(Pb) | Pt(Ni) | Pt(Pb) | Rh(Ni) | Ru(Ni) | Au(Ni) | Au(Pb) | Ir(Ni) | Co(M) | Co(AR) | Cu(M) | Cu(AR) | Cu(X) | Ni(M) | Ni(AR) | Ni(X) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~AMIS 0314~~ | ~~11.74~~ | ~~11.35~~ | ~~34.17~~ | ~~32.20~~ | ~~(1.89)~~ | ~~5.13~~ | ~~2.50~~ | ~~2.53~~ | ~~(0.91)~~ | ~~0.0242~~ | ~~0.0212~~ | ~~0.7326~~ | ~~0.7115~~ | ~~0.7183~~ | ~~0.8790~~ | ~~0.8429~~ | ~~0.9073~~ |
| ~~AMIS 0354~~ | ~~(1.33)~~ | ~~1.34~~ | ~~(2.19)~~ | ~~2.25~~ | ~~(0.25)~~ | ~~(0.39)~~ | ~~(0.68)~~ | ~~0.71~~ | ~~(0.08)~~ | ~~(0.0145)~~ | ~~(0.00911)~~ | ~~0.0582~~ | ~~0.0586~~ | ~~0.0587~~ | ~~(0.1839)~~ | ~~0.1493~~ | ~~(0.1886)~~ |
| ~~AMIS 0443~~ | ~~.~~ | ~~0.97~~ | ~~.~~ | ~~0.78~~ | ~~(0.07)~~ | ~~.~~ | ~~.~~ | ~~(0.14)~~ | ~~.~~ | ~~0.00908~~ | ~~(0.00700)~~ | ~~0.0951~~ | ~~0.0935~~ | ~~0.0879~~ | ~~0.1918~~ | ~~0.1678~~ | ~~(0.1833)~~ |
| ~~AMIS 0451~~ | ~~.~~ | ~~(0.254)~~ | ~~(0.534)~~ | ~~(0.518)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(0.044)~~ | ~~.~~ | ~~(0.0142)~~ | ~~(0.001312)~~ | ~~0.00755~~ | ~~0.00757~~ | ~~.~~ | ~~0.0903~~ | ~~0.0214~~ | ~~.~~ |

analysis listed in mass %  S by combustion, rest by XRF  SP.G = Specific Gravity  4E = sum Pd + Pt + Rh + Au  100 g units

| Number | $Al_2O_3$ | CaO | Co | Cr | $Cr_2O_3$ | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | S | $SiO_2$ | $TiO_2$ | Sp.G | LOI | 4E g/t |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~AMIS 0314~~ | ~~7.75~~ | ~~5.46~~ | ~~(0.0271)~~ | ~~.~~ | ~~0.96~~ | ~~15.68~~ | ~~0.14~~ | ~~17.04~~ | ~~0.15~~ | ~~0.58~~ | ~~3.49~~ | ~~44.23~~ | ~~0.22~~ | ~~3.11~~ | ~~(4.92)~~ | ~~50.30~~ |
| ~~AMIS 0354~~ | ~~5.50~~ | ~~4.01~~ | ~~.~~ | ~~.~~ | ~~1.94~~ | ~~18.32~~ | ~~0.09~~ | ~~23.65~~ | ~~0.24~~ | ~~0.37~~ | ~~0.36~~ | ~~44.63~~ | ~~0.59~~ | ~~3.330~~ | ~~.~~ | ~~4.45~~ |
| ~~AMIS 0443~~ | ~~8.10~~ | ~~7.08~~ | ~~.~~ | ~~.~~ | ~~1.72~~ | ~~11.61~~ | ~~0.26~~ | ~~20.06~~ | ~~0.32~~ | ~~0.62~~ | ~~.~~ | ~~44.67~~ | ~~0.25~~ | ~~3.03~~ | ~~(4.77)~~ | ~~1.96~~ |
| ~~AMIS 0451~~ | ~~11.61~~ | ~~4.05~~ | ~~.~~ | ~~.~~ | ~~13.42~~ | ~~16.89~~ | ~~0.13~~ | ~~16.69~~ | ~~(0.19)~~ | ~~0.62~~ | ~~.~~ | ~~36.19~~ | ~~0.46~~ | ~~3.46~~ | ~~.~~ | ~~0.83~~ |

## CRM NOBLE METAL ORE

analysis listed in ppb (ng/g)  mass % except * which is mg/kg  GPP: 10g or 1kg  NCS: 500g or 1kg  CAN WMS-1A: 200g  other CAN: 400g

| Number | Au | Ir | Os | Pd | Pt | Rh | Ru | Hg | $Al_2O_3$ | As* | Cr* | Cu | $Fe_2O_3$ | $K_2O$ | MnO | Ni | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~NCS DC29116~~ | ~~(2310)~~ | ~~1.6~~ | ~~1.9~~ | ~~1680~~ | ~~2430~~ | ~~1.9~~ | ~~1.5~~ | ~~(0.70)~~ | ~~(1.47)~~ | ~~(12.24)~~ | ~~(0.17)~~ | ~~3.58~~ | ~~(13.10)~~ | ~~(0.12)~~ | ~~(0.11)~~ | ~~1.78~~ | ~~(7.44)~~ |
| ~~NCS DC29119~~ | ~~(2120)~~ | ~~1.9~~ | ~~1.6~~ | ~~1330~~ | ~~4440~~ | ~~1.4~~ | ~~0.71~~ | ~~(7.01)~~ | ~~(0.87)~~ | ~~(537.6)~~ | ~~(0.06)~~ | ~~0.62~~ | ~~(1.59)~~ | ~~(0.12)~~ | ~~(0.047)~~ | ~~1.76~~ | ~~(0.19)~~ |
| GPP-10 | 1576 | . | . | 2008 | 2349 | . | . | . | . | . | . | . | . | . | . | . | . |
| ~~NCS DC29118~~ | ~~(1450)~~ | ~~3.2~~ | ~~3.0~~ | ~~700~~ | ~~900~~ | ~~3.2~~ | ~~3.5~~ | ~~(1.01)~~ | ~~(4.90)~~ | ~~(21.58)~~ | ~~(0.093)~~ | ~~3.25~~ | ~~(24.09)~~ | ~~(0.35)~~ | ~~(0.13)~~ | ~~1.76~~ | ~~(13.41)~~ |
| ~~NCS DC29118~~ | ~~(1450)~~ | ~~3.2~~ | ~~3.0~~ | ~~700~~ | ~~900~~ | ~~3.2~~ | ~~3.5~~ | ~~(1.01)~~ | ~~(4.90)~~ | ~~(21.58)~~ | ~~(0.093)~~ | ~~3.25~~ | ~~(24.09)~~ | ~~(0.35)~~ | ~~(0.13)~~ | ~~1.76~~ | ~~(13.41)~~ |
| ~~NCS DC29117~~ | ~~(1430)~~ | ~~4.4~~ | ~~3.7~~ | ~~600~~ | ~~10610~~ | ~~3.6~~ | ~~4.2~~ | ~~(1.39)~~ | ~~(4.50)~~ | ~~(22.6)~~ | ~~(0.16)~~ | ~~3.01~~ | ~~(26.66)~~ | ~~(0.39)~~ | ~~(0.12)~~ | ~~0.053~~ | ~~(13.57)~~ |
| GPP-06 | 980 | . | . | 709 | 938 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-02 | 929 | . | . | 523 | 505 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-14 | 909 | . | . | 481 | 503 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-05 | 859 | . | . | 699 | 912 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-11 | 722 | . | . | 567 | 592 | . | . | . | . | . | . | . | . | . | . | . | last |
| GPP-13 | 612 | . | . | 390 | 307 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-09 | 603 | . | . | 408 | 343 | . | . | . | . | . | . | . | . | . | . | . | . |
| CAN WMS-1A | 300 | (322) | (150) | 1450 | 1910 | 222 | (145) | . | Al:1.350 | 30.9 | (68) | 1.396 | 45.4 Fe | . | . | . | 28.17 |
| ~~NCS DC29120~~ | ~~(170)~~ | ~~23.6~~ | ~~8.2~~ | ~~400~~ | ~~380~~ | ~~18.0~~ | ~~7.8~~ | ~~(58.1)~~ | ~~(2.83)~~ | ~~(66.0)~~ | ~~(0.30)~~ | ~~0.11~~ | ~~(9.30)~~ | ~~(0.12)~~ | ~~(0.14)~~ | ~~0.22~~ | ~~(0.17)~~ |
| GPP-04 | 80 | . | . | 98 | 88 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-12 | 50 | . | . | 47 | 48 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-08 | 49 | . | . | 45 | 54 | . | . | . | . | . | . | . | . | . | . | . | last |
| CAN UMT-1 | 48 | 8.8 | . | 106 | 128 | 9.5 | 10.9 | . | . | . | . | . | . | . | . | . | . |
| NCS DC73357 | (45) | 28 | 15.6 | 568 | 440 | 22 | 13 | . | . | . | . | . | . | . | . | . | . |
| GPP-07 | 25 | . | . | 23 | 28 | . | . | . | . | . | . | . | . | . | . | . | last |
| NCS DC73353 | 10 | 0.05 | 0.06 | 2.3 | 1.6 | 0.95 | (0.10) | . | . | . | . | . | . | . | . | . | . |
| CAN TDB-1 | 6.3 | . | . | 22.4 | 5.8 | . | . | . | . | . | . | . | . | . | . | . | . |
| GPP-03 | 4 | . | . | 7 | 8 | . | . | . | . | . | . | . | . | . | . | . | . |
| CAN WGB-1 | 2.9 | (0.33) | . | 13.9 | 6.1 | (0.32) | (0.3) | . | . | . | 291 | . | 6.71 | 0.94 | . | MgO: 9.40 | . |
| NCS DC73358 | (1.8) | 1.2 | 0.64 | 15.2 | 14.7 | 1.1 | 0.66 | . | . | . | . | . | . | . | . | . | . |
| NCS DC73354 | 1.1 | 4.3 | 9.6 | 4.6 | 6.4 | 1.3 | 14.8 | . | . | . | . | . | . | . | . | . | . |
| NCS DC73352 | 0.9 | 0.032 | 0.05 | 0.26 | 0.26 | 0.017 | (0.05) | . | . | . | . | . | . | . | . | . | . |
| NCS DC73356 | . | 136 | 353 | 11.3 | 20 | 10 | 527 | . | . | . | . | . | . | . | . | . | . |
| NCS DC73398 | . | 28 | 43 | 570 | 1900 | 7.3 | 74 | . | . | . | . | . | . | . | . | . | . |
| NCS DC73399 | . | 2.1 | (2) | 1670 | 5700 | 1.5 | (2) | . | . | . | . | . | . | . | . | . | . |
| Number | Au | Ir | Os | Pd | Pt | Rh | Ru | Hg | $Al_2O_3$ | As* | Cr* | Cu | $Fe_2O_3$ | $K_2O$ | MnO | Ni | S |

## CRM OBSIDIAN

analysis listed in mass % — 35 g units

| Number | $Al_2O_3$ | CaO | FeO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SRM 278 | 14.15 | 0.983 | 1.36 | 2.04 | 4.16 | (0.23) | 0.052 | 4.84 | 0.036 | 73.05 | 0.245 |

analysis listed in mg/kg

| Number | Cu | Ni | Pb | Rb | Sr | Th | Ti | U |
|---|---|---|---|---|---|---|---|---|
| SRM 278 | 5.9 | 3.6 | 16.4 | 127.5 | 63.5 | 12.4 | 0.54 | 4.58 |

## RM OLIVINE WITH EXTENSIVE ANALYSIS

analysis listed in mass % — 100 g units

| Number | $Al_2O_3$ | CaO | Co | Cr | $TFe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | Ni | $P_2O_2$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG MUH-1 | 1.33 | 1.21 | 0.0106 | (0.2710) | 8.59 | 0.012 | 38.2 | 0.117 | 0.10 | 0.210 | 0.007 | 40.3 | 0.034 | 9.38 |

continued analysis listed in mg/kg

| Number | As | Ba | Ce | Cs | Cu | Dy | Er | Eu | Ga | Gd | Hf | Ho | La | Li | Lu | Nb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG MUH-1 | (3.6) | 4.9 | (0.20) | 0.099 | 19 | 0.153 | 0.108 | 0.026 | 1.38 | (0.110) | 0.04 | 0.035 | (0.134) | (1.8) | 0.019 | (0.062) |

| Number | Nd | Pb | Pr | Rb | Sb | Sc | Sm | Sr | Tb | Th | Tm | U | V | Y | Yb | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG MUH-1 | 0.177 | (0.42) | 0.035 | 0.27 | (0.134) | 9.0 | 0.067 | (8.5) | 0.0212 | 0.018 | 0.0170 | (0.014) | (41) | (0.97) | 0.118 | 44 |

## RM OLIVINE

typical analysis listed in mass % — 100 g units

| Number | MgO | $SiO_2$ | Fe | $Al_2O_3$ | C tot | $CO_2$ | CaO | $Co_3O_4$ | $Cr_2O_3$ | $K_2O$ | $Mn_3O_4$ | NiO | $P_2O_5$ | $TiO_2$ | $-H_2O$ at 900'C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH 4912 | 49.18 | 41.6 | 5.07 | 0.432 | 0.054 | 0.046 | 0.081 | 0.016 | 0.383 | 0.014 | 0.103 | 0.354 | . | 0.002 | 1.25 |

## CRM OOZE

| Number | Type | $SiO_2$ | $Al_2O_3$ | Ba | $CO_2$ | CaO | Ce | Cr | FeO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 5370-90 | **Calcerous** | 11.90 | 3.60 | 0.010 | 32.20 | 39.23 | . | 0.0034 | 0.17 | 2.44 | 0.51 | 3.44 | 0.218 | 1.86 | 0.23 | 0.30 | 36.6 |
| VS 5371-90 | **Siliceous** | 59.60 | 8.96 | 0.15 | 2.70 | 6.40 | 0.033 | 0.0080 | 1.2 | 5.05 | 1.39 | 3.16 | 0.37 | 4.52 | 0.12 | 0.59 | 9.6 |

continued analysis listed in mass %

| Number | As | B | Org.C | Cu | Ni | S | Sn | Sr | V | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 5370-90 | . | . | . | 0.0030 | 0.0038 | 0.19 | 0.021 | 0.12 | 0.0057 | 0.010 | 0.008 |
| VS 5371-90 | 0.0020 | 0.007 | 0.34 | 0.014 | 0.010 | 0.17 | 0.00032 | 0.034 | 0.0085 | 0.0090 | 0.010 |

continued analysis listed in mg/kg

| Number | Au | Be | Co | Cs | Ga | La | Li | Mo | Nb | Nd | Pb | Rb | Sc | Sm | Th | U | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 5370-90 | . | 1.0 | 12 | . | 5 | 7 | 13 | 4 | . | . | 11 | 11 | 6 | . | 3 | . | 9 | . |
| VS 5371-90 | 0.004 | 1.6 | 30 | 3.0 | 11 | 15 | 18 | 2.8 | 10 | 13 | 24 | 46 | 17 | 2.5 | 5 | 1.5 | 16 | 2.2 |

## PEGMATITE WITH EXTENSIVE ANALYSIS

analysis listed in mass % IAG: RM, ~35 g units NCS: CRM, 70 g units VS: CRM, 50 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | F | FeO | $Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | Mn | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 6318-92 | 18.81 | . | 0.43 | 0.107 | 0.49 | 0.80T | . | 1.33 | 0.27 | . | 0.054 | 8.44 | 0.29 | . | 68.06 | 0.100 | 0.91 |
| NCS DC71313 | 13.19 | (0.05) | (0.1) | (0.03) | (0.04) | (0.24T) | (1.02) | 6.22 | 0.13 | (0.01) | . | 1.60 | 0.18 | 0.07 | 76.40 | 0.61 | 1.27 |
| IAG OU-9 | 12.35 | . | 0.29 | . | . | 0.74 | . | 1.36 | . | . | 0.11 | 4.17 | 0.03 | . | 79.5 | 0.057 | 0.78 |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 6318-92 | . | . | . | . | 56 | . | . | . | . | 13 | 95 | . | . | . | . | 35 | . |
| NCS DC71313 | (0.09) | 3.1 | (1.9) | (728) | 1.3 | (0.07) | 0.15 | (5) | (1.5) | 4.8 | 1.8 | 4.2 | 0.20 | 0.12 | (0.16) | 13.5 | 0.22 |
| IAG OU-9 | . | . | . | 8.75 | . | . | . | 7.24 | . | . | 403.3 | . | 1.70 | 0.30 | 0.05 | 56.6 | 2.53 |

| Number | Ge | Hf | Hg | Ho | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 6318-92 | 8.6 | . | . | . | . | 220 | . | . | 72 | . | . | . | . | 450 | . | . | . |
| NCS DC71313 | 1.5 | (0.8) | (0.008) | (0.04) | (3.3) | 14.4 | 0.03 | (0.29) | 14.6 | 1.5 | (1.6) | 34.6 | 0.48 | 155 | 0.64 | (2.85) | (0.015) |
| IAG OU-9 | 4.95 | . | . | 0.15 | 2.03 | 694.6 | 0.04 | . | 155.3 | 5.07 | . | . | 1.24 | 2501 | 7.67 | 2.77 | . |

| Number | Sm | Sn | Sr | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 6318-92 | . | 600 | 68 | 69 | . | . | . | . | . | 14 | . | . | . | 49 | 56 |
| NCS DC71313 | (0.24) | 3.5 | 45.5 | 1.3 | (0.04) | 0.66 | . | (0.02) | (0.75) | 44.5 | 3.2 | 1.6 | 0.21 | 20.3 | 22.6 |
| IAG OU-9 | 3.15 | . | . | 124.7 | 0.46 | 5.08 | 13.8 | 0.05 | 4.37 | . | 6.1 | 8.14 | . | 28.15 | . |

## CRM PERIDOTITE WITH EXTENSIVE ANALYSIS

anlaysis listed in mass %

| Number | Al | $Al_2O_3$ | C | $CO_2$ | Ca | CaO | Co | Cr | Cu | Fe | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O-$ | $H_2O+$ | K | $K_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2111-81~~ | ~~.~~ | ~~1.84~~ | ~~.~~ | ~~0.69~~ | ~~.~~ | ~~1.26~~ | ~~0.0159~~ | ~~0.320~~ | ~~0.0140~~ | ~~.~~ | ~~8.83~~ | ~~.~~ | ~~11.58~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.044~~ |
| CAN WPR-1a | 2.621 | . | (0.15) | . | 2.528 | . | 0.0213 | (0.322) | 0.299 | 11.34 | . | . | . | . | . | 0.156 | . |
| JP-1 | 0.35 | 0.66 | (0.0764) | . | 0.39 | 0.55 | 0.0116 | 0.2807 | 0.000672 | 5.85 | 5.99 | 1.98 | 8.37 | 0.44 | 2.39 | 0.002 | 0.003 |

| Number | Mg | MgO | Mn | MnO | Na | $Na_2O$ | Ni | P | $P_2O_5$ | S | Si | $SiO_2$ | Ti | $TiO_2$ | V | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2111-81~~ | ~~.~~ | ~~37.12~~ | ~~.~~ | ~~0.183~~ | ~~.~~ | ~~0.105~~ | ~~0.160~~ | ~~.~~ | ~~.~~ | ~~0.030~~ | ~~.~~ | ~~45.54~~ | ~~.~~ | ~~0.107~~ | ~~0.0039~~ | ~~0.0137~~ | ~~.~~ |
| CAN WPR-1a | (15.22) | . | 0.138 | . | (0.050) | . | 0.439 | 0.0303 | . | 1.768 | 17.62 | . | 0.3527 | . | 0.0135 | 0.0160 | (8.42) |
| JP-1 | 26.9 | 44.60 | 0.094 | 0.121 | 0.02 | 0.021 | 0.2460 | . | (0.002) | (0.00269) | 19.81 | 42.38 | . | (0.006) | 0.00276 | 0.00418 | . |

continued analysis listed in mg/kg

| Number | Ag | As | Au | B | Ba | Be | Bi | Cd | Ce | Cl | Cs | Dy | Er | Eu | F | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2111-81~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~66~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~5.9~~ | ~~.~~ |
| CAN WPR-1a | 1.02 | 9.3 | (0.05) | . | 70.6 | (0.2) | 0.122 | 0.598 | 9.69 | . | 2.38 | 1.624 | 0.886 | 0.497 | . | 7.04 | 1.76 |
| JP-1 | (1.5) | 0.34 | (0.00023) | (1.4) | (19.5) | . | . | (0.011) | (0.19) | (97) | (0.15) | (0.022) | (0.016) | (0.004) | (14) | (0.7) | (0.015) |

| Number | Ge | Hf | Hg | Ho | In | Ir | La | Li | Lu | Mo | Nb | Nd | Os | Pb | Pd | Pr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2111-81~~ | ~~1.6~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.3~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~6.7~~ | ~~.~~ | ~~.~~ |
| CAN WPR-1a | (0.3) | 1.142 | (0.05) | 0.322 | (0.0899) | (0.2) | 4.04 | 25.6 | 0.121 | (0.9) | (3.88) | 6.26 | . | 7.92 | 0.614 | 1.362 |
| JP-1 | (0.49) | 0.2 | (0.0053) | (0.018) | . | (2) | 0.084 | (1.79) | (0.0044) | (0.087) | 1.48 | (0.072) | (0.0079) | (0.12) | (0.0013) | (0.02) |

| Number | Pt | Rb | Re | Ru | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 2111-81~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~11.3~~ | ~~.~~ | ~~.~~ | ~~3.2~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| CAN WPR-1a | 0.452 | 7.06 | . | . | 3.13 | 17.3 | (7.7) | 1.617 | (1.16) | 19.5 | (0.242) | 0.269 | (0.958) | (0.64) | (0.0752) | 0.126 |
| JP-1 | (0.0049) | (0.8) | (0.00001) | (0.0065) | (0.034) | 7.24 | . | 0.019 | (0.05) | (3.32) | (0.02) | (0.003) | . | 0.19 | (0.003) | . |

| Number | U | W | Y | Yb | Zr | Units |
|---|---|---|---|---|---|---|
| ~~VS 2111-81~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.5~~ | ~~21~~ | ~~40 g~~ |
| CAN WPR-1a | . | . | 8.39 | 0.79 | (41.8) | 400 g |
| JP-1 | 0.036 | (0.85) | 1.54 | 0.022 | 5.92 | 20 g |

## CRM PHOSPHATE ROCK

* CaO+SrO ** AFPC Method (s) = soluble analysis listed in mass % GPO: 10 g units SRM: 90 g units others: 100 g units

| Number | $P_2O_5$ | CaO | $Al_2O_3$ | $CO_2$ | F | $Fe_2O_3$ | $TFe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | S | $SO_3$ | $SiO_2$ | SrO | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 32 | 39.96 | 54.44 | (0.05) | 1.61 | 2.49 | 0.14 | . | . | 0.50 | (0.026) | . | . | . | (0.4) | 0.52 | . | . |
| ~~GBW 07210~~ | ~~36.89~~ | ~~51.32*~~ | ~~0.58~~ | ~~2.15~~ | ~~3.54~~ | ~~.~~ | ~~1.04~~ | ~~0.17~~ | ~~0.43~~ | ~~0.024~~ | ~~0.33~~ | ~~.~~ | ~~.~~ | ~~3.26~~ | ~~0.077~~ | ~~0.037~~ | ~~.~~ |
| IPT 18B | 35.7 | 52.6 | 0.35 | . | 1.33 | 0.21 | . | 0.23 | 1.65(s) | . | 0.14(s) | . | . | 1.15 | 0.48(s) | . | . |
| ~~SRM 120c~~ | ~~33.34**~~ | ~~48.02**~~ | ~~1.30~~ | ~~3.27**~~ | ~~3.82**~~ | ~~1.08~~ | ~~.~~ | ~~0.147~~ | ~~0.32**~~ | ~~0.027~~ | ~~0.52~~ | ~~(0.37)~~ | ~~.~~ | ~~5.5**~~ | ~~(0.1)~~ | ~~0.103~~ | ~~.~~ |
| ~~BCR 032~~ | ~~32.98~~ | ~~51.76~~ | ~~0.55~~ | ~~5.10~~ | ~~4.04~~ | ~~0.231~~ | ~~.~~ | ~~.~~ | ~~0.403~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.84~~ | ~~2.09~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| SRM 694 | 30.2 | 43.6 | 1.8 | . | 3.2 | 0.79 | . | 0.51 | 0.33 | 0.0116 | 0.86 | . | . | 11.2 | . | (0.11) | . |
| GPO-01 | 28.66 | 40.08 | 6.92 | . | . | 3.412 | . | 0.10 | 0.83 | 0.093 | 0.307 | . | 1.318 | 4.381 | . | 0.37 | 12.45 |
| USZ 14-94 | 26.38 | 38.85 | 0.85 | 5.84 | . | . | 0.63 | 0.092 | 2.26 | . | . | . | . | 20.57 | . | . | 6.43 |
| ~~GPO-15~~ | ~~25.22~~ | ~~45.12~~ | ~~0.74~~ | ~~.~~ | ~~.~~ | ~~0.803~~ | ~~.~~ | ~~0.25~~ | ~~2.90~~ | ~~0.010~~ | ~~1.039~~ | ~~.~~ | ~~2.426~~ | ~~7.77~~ | ~~.~~ | ~~0.05~~ | ~~12.32~~ |
| GPO-14 | 24.52 | 44.77 | 0.78 | . | . | 0.819 | . | 0.26 | 3.07 | 0.047 | 0.979 | . | 2.284 | 8.13 | . | 0.05 | 12.96 |
| ~~GBW 07211~~ | ~~20.86~~ | ~~40.71*~~ | ~~2.58~~ | ~~18.46~~ | ~~2.05~~ | ~~.~~ | ~~1.08~~ | ~~0.28~~ | ~~8.19~~ | ~~0.015~~ | ~~0.059~~ | ~~0.79~~ | ~~.~~ | ~~3.61~~ | ~~0.16~~ | ~~0.14~~ | ~~.~~ |
| USZ HF | 13.81 | 33.80 | . | . | . | . | 0.37 | 0.077 | 8.30 | . | 0.12 | . | . | 28.04 | . | . | . |
| GBW 07212 | 6.06 | 19.42* | 4.06 | 16.41 | 0.51 | . | 3.08 | 2.63 | 7.12 | 0.026 | 0.14 | . | . | 38.80 | 0.055 | 0.48 | . |
| GPO-13 | 4.94 | 6.84 | 10.02 | . | . | 5.391 | . | 3.75 | 0.68 | 0.030 | 1.454 | . | 0.239 | 62.622 | . | 0.16 | 3.43 |

continued analysis listed in mass % analysis listed in mg/kg

| Number | BaO | CdO | U | $U_3O_8$ | $V_2O_3$ | $V_2O_5$ | As | B | Cd | Cl | Co | Cr | Cu | Hg | I | Mn | Ni | Ti | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 32 | . | . | . | . | . | . | . | . | . | (640) | . | . | . | . | . | . | . | . | . | . |
| ~~GBW 07210~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~52~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| IPT 18B | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| ~~SRM 120c~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.0135~~ | ~~0.016~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| ~~BCR 032~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~9.5~~ | ~~22.6~~ | ~~20.8~~ | ~~.~~ | ~~0.59~~ | ~~257~~ | ~~33.7~~ | ~~0.0551~~ | ~~.~~ | ~~18.8~~ | ~~34.6~~ | ~~171~~ | ~~153~~ | ~~253~~ |
| SRM 694 | . | 0.015 | 0.01414 | . | . | 0.31 | . | . | . | . | . | . | . | . | . | . | . | last of stock | | |
| GPO-01 | 0.05 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | last of stock | | |
| USZ 14-94 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| ~~GPO-15~~ | ~~0.015~~ | ~~.~~ | ~~(0.00568)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~52~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| GPO-14 | 0.015 | . | (0.00566) | . | . | . | . | . | . | . | . | . | . | . | 52 | . | . | last of stock | | |
| ~~GBW 07211~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~59~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| USZ HF | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GBW 07212 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GPO-13 | 0.01 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | last of stock | | |

## CRM PLAGIOGNEISS WITH EXTENSIVE ANALYSIS

analysis listed in mass % 100 g units

| Number | $Al_2O_3$ | Ba | $CO_2$ | CaO | Cr | F | FeO | $T.Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | Zr | LOI | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 8871-2007 | 15.90 | 0.091 | (0.13) | 2.85 | 0.0182 | 0.0573 | 4.14 | 6.06 | (1.1) | 3.56 | 2.59 | 0.069 | 2.25 | 0.080 | 64.92 | 0.70 | 0.0234 | 0.76 | last |

analsis listed in mg/kg

| Number | Ag | As | B | Be | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Ge | Hf | Ho | La | Li | Lu | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 8871-2007 | (0.09) | (2.0) | (100) | 0.97 | (0.10) | 104 | 19.7 | 182 | 0.32 | 31 | 3.3 | 2.1 | 1.8 | 18.5 | 4.7 | (1.1) | 6.2 | 0.69 | 53 | 21 | 0.31 | 1.7 |

| Number | Nb | Nd | Ni | Pb | Pr | Rb | S | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 8871-2007 | 10.0 | 43.8 | 60 | 14.2 | 11.5 | 55 | (74) | (0.05) | 14.3 | 6.9 | (0.6) | 364 | 0.40 | 0.6 | 11.3 | 0.31 | 0.33 | 0.8 | 98 | (0.3) | 17.8 | 2.02 | 81 |

## CRM PROPHILITE

analysis listed in mass % 50 g units

| Number | $Al_2O_3$ | CaO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCRM R802 | 32.3 | 0.04 | 0.23 | . | . | 0.07 | <0.01 | . | 0.09 | 0.05 | . | 60.7 | 0.19 | 6.0 |
| NCS DC60127 | 23.58 | 0.17 | . | 1.94 | 4.15 | 0.38 | 0.087 | 0.0037 | 0.34 | 0.20 | 0.61 | 66.84 | 0.70 | 5.48 |
| NCS DC60128 | 22.20 | 0.066 | . | 0.22 | 5.57 | 0.028 | 0.041 | 0.0040 | 0.043 | 0.11 | 0.17 | 70.34 | 0.18 | 6.34 |

## CRM QUARTZ

analysis listed in mass % T = Total US: 25 g

| Number | $SiO_2$ | $Al_2O_3$ | CaO | FeO | $Fe_2O_3$ | $Fe_2O_3T$ | $K_2O$ | MgO | Mn | $Na_2O$ | $P_2O_5$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US QLO-1A~~ | ~~65.6~~ | ~~16.2~~ | ~~3.17~~ | ~~2.97~~ | ~~1.02~~ | ~~4.35~~ | ~~3.60~~ | ~~1.00~~ | ~~.~~ | ~~4.20~~ | ~~0.25~~ | ~~0.62~~ |

## CRM QUARTZITE

analysis listed in mass % analysis listed in mg/kg

| Number | $SiO_2$ | $Al_2O_3$ | CaO | $Cr_2O_3$ | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI | As | Ba | Be | Bi | Cd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71325 | 99.18 | 0.29 | 0.036 | 0.0053 | 0.16 | 0.050 | 0.022 | 0.0049 | 0.010 | 0.0036 | 0.014 | 0.14 | 0.48 | 17.4 | 0.09 | 0.034 | 0.015 |
| NCS DC71324 | 95.97 | 1.33 | 0.59 | 0.0083 | 0.61 | 0.28 | 0.15 | 0.0080 | 0.13 | 0.018 | 0.059 | 0.69 | 1.3 | 56.8 | 0.21 | 0.050 | 0.025 |
| NCS DC71323 | 92.93 | 2.43 | 1.20 | 0.0077 | 0.62 | 0.60 | 0.29 | 0.015 | 0.28 | 0.025 | 0.10 | 1.35 | 0.89 | 84.2 | 0.41 | 0.036 | 0.037 |

analysis listed in mg/kg 80 g units

| Number | Ce | Cl | Co | Cu | Hg | La | Li | Mo | Ni | Pb | Rb | Sb | Sr | Th | U | V | W | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71325 | 1.1 | (15) | 1.6 | 8.9 | (0.002) | 0.54 | 2.5 | 3.8 | 15.8 | 31.7 | 3.0 | 0.20 | 3.0 | 0.14 | 0.10 | 1.8 | 0.19 | 3.7 | (1.7) |
| NCS DC71324 | 19.3 | (38) | 1.4 | 13.4 | (0.002) | 9.3 | 2.7 | 2.1 | 23.9 | 69.4 | 10.3 | 0.22 | 20.0 | 1.8 | 0.48 | 7.4 | 0.27 | 7.8 | 53 |
| NCS DC71323 | 16.7 | (34) | 1.8 | 14.6 | (0.003) | 8.8 | 3.4 | 1.6 | 21.5 | 39.7 | 16.7 | 0.20 | 33.9 | 2.9 | 0.58 | 11.9 | 0.47 | 11.2 | 93 |

## CRM RARE EARTH ORE WITH EXTENSIVE ANALYSIS

analysis listed in mass & except * which is mg/kg (ppm) powder 10 g units

| Number | Ag* | Al | $Al_2O_3$ | As* | B | Ba | BaO | Be* | Bi* | Ca | CaO | Cd* | Ce | $CeO_2$ | Co* | Cr | $Cr_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 460b | 0.331 | 7.22 | 13.64 | 286 | . | 0.0794 | 0.0887 | 2.58 | 13.0 | 0.559 | 0.782 | <10 | 0.168 | 0.206 | 6.21 | 0.0280 | 0.0409 |
| OREAS 461 | <2 | 5.99 | 11.31 | 33.6 | (0.0151) | 0.0929 | 0.1037 | 2.3 | 2.49 | 1.26 | 1.76 | <1 | 0.3510 | 0.4311 | 11.5 | 0.0599 | 0.0875 |
| OREAS 462 | <2 | 5.79 | 10.95 | 30.8 | (0.0150) | 0.1025 | 0.1144 | 3.76 | 2.58 | 1.28 | 1.79 | <2 | 0.4951 | 0.6082 | 12.5 | 0.0609 | 0.0890 |
| OREAS 463 | <3 | 5.63 | 10.64 | 31.3 | (0.0147) | 0.1106 | 0.1235 | 5.62 | 2.75 | 1.22 | 1.71 | <1 | 0.659 | 0.810 | 15.2 | 0.0574 | 0.0838 |
| OREAS 464 | 4.4 | 4.63 | 8.75 | 32.9 | (0.0108) | 0.1657 | 0.1850 | 15.6 | 3.8 | 0.896 | 1.25 | 0.52 | 1.53 | 1.88 | 18 | 0.0395 | 0.0577 |
| OREAS 465 | 5.5 | 6.60 | 12.47 | . | . | 0.4397 | 0.4909 | 13.2 | 16.9 | 0.900 | 1.26 | 1.2 | 3.95 | 4.86 | 18.7 | 0.0544 | 0.0795 |

| Number | Cs* | Cu* | Dy | $Dy_2O_3$ | Er | $Er_2O_3$ | Eu | $Eu_2O_3$ | Fe | $Fe_2O_3$ | Ga | Gd | $Gd_2O_3$ | Ge* | $H_2O-$ | Hf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 460b | 6.52 | 43.8 | 0.00177 | 0.00203 | 0.000550 | 0.000629 | 0.00205 | 0.00236 | 16.05 | 22.95 | 0.00261 | 0.00453 | 0.0052 | . | . | 0.00100 |
| OREAS 461 | 0.79 | 60 | 0.00348 | 0.00400 | 0.000880 | 0.00101 | 0.00467 | 0.0054 | 31.77 | 46.09 | 0.0050 | 0.0100 | 0.0116 | (3.60 | 0.697 | 0.00141 |
| OREAS 462 | 0.44 | 61 | 0.0051 | 0.0059 | 0.00122 | 0.00140 | 0.0079 | 0.0091 | 33.84 | 48.69 | 0.0052 | 0.0165 | 0.0190 | (6.00) | 0.667 | 0.00140 |
| OREAS 463 | 0.42 | 74 | 0.0070 | 0.0081 | 0.00160 | 0.00183 | 0.0115 | 0.0133 | 34.47 | 49.29 | 0.0063 | 0.0241 | 0.0278 | (9.08) | 0.64 | 0.00138 |
| OREAS 464 | 0.27 | 92 | 0.0178 | 0.0204 | 0.00382 | 0.00436 | 0.0324 | 0.0375 | 37.24 | 53.24 | 0.0106 | 0.0676 | 0.0779 | (43.3) | 0.503 | 0.00125 |
| OREAS 465 | <0.1 | 128 | 0.0217 | 0.0249 | 0.0050 | 0.0058 | 0.0286 | 0.0331 | 34.71 | 49.96 | 0.0214 | 0.0584 | 0.0674 | (6.0) | 0.312 | 0.00414 |

| Number | $HfO_2$ | Ho* | $Ho_2O_3$* | In* | K | $K_2O$ | La | $La_2O_3$ | Li* | Lu* | $Lu_2O_3$* | Mg | MgO | Mn | MnO | Mo* | Na |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 460b | 0.00118 | 2.54 | 2.91 | 0.33 | 1.46 | 1.73 | 0.122 | 0.143 | 30.8 | 0.46 | 0.53 | 0.648 | 1.08 | 0.031 | 0.0404 | 22.9 | 0.152 |
| OREAS 461 | 0.00166 | 4.56 | 5.22 | 0.6 | 0.237 | 0.285 | 0.2690 | 0.3115 | 12 | 0.52 | 0.59 | 1.05 | 1.74 | 0.0653 | 0.0843 | 45.7 | 0.178 |
| OREAS 462 | 0.00165 | 6.50 | 7.44 | 0.75 | 0.120 | 0.145 | 0.3794 | 0.4517 | 11.3 | 0.63 | 0.72 | 1.08 | 1.80 | 0.0933 | 0.1204 | 51 | 0.178 |
| OREAS 463 | 0.00163 | 8.71 | 9.98 | 1.01 | 0.119 | 0.143 | 0.4773 | 0.5824 | 10.5 | 0.79 | 0.9 | 1.02 | 1.70 | 0.121 | 0.156 | 56 | 0.173 |
| OREAS 464 | 0.00148 | 21.3 | 24.4 | 2.14 | 0.086 | 0.104 | 1.17 | 1.37 | 8.26 | 1.57 | 1.92 | 0.825 | 1.40 | 0.270 | 0.365 | 77 | 0.149 |
| OREAS 465 | 0.00488 | 27.7 | 31.7 | 3.47 | . | . | 2.41 | 2.84 | 3.04 | 2.1 | 2.39 | 0.392 | 0.650 | 0.263 | 0.339 | 114 | <0.2 |

| Number | Nb | $Nb_2O_5$ | Nd | $Nd_2O_3$ | Ni | NiO | P | $P_2O_3$ | Pb | PbO | Pr | $Pr_6O_{11}$ | Rb* | Re* | S | Sb* | Sc* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 460b | 0.0645 | . | 0.075 | 0.088 | 0.00366 | . | 0.173 | 0.396 | 0.0056 | . | 0.0217 | 0.0262 | 82 | . | 0.028 | . | 29.4 |
| OREAS 461 | 0.1296 | 0.1854 | 0.1629 | 0.1900 | 0.0064 | 0.0081 | 0.359 | 0.822 | 0.0106 | 0.0114 | 0.0489 | 0.0590 | 13.5 | <0.01 | 0.0518 | 2.76 | 38.8 |
| OREAS 462 | 0.1447 | 0.2070 | 0.2560 | 0.2985 | 0.0066 | 0.0085 | 0.492 | 1.13 | 0.0114 | 0.0123 | 0.0735 | 0.0888 | 6.58 | <0.01 | 0.0587 | 2.57 | 51 |
| OREAS 463 | 0.1495 | 0.2139 | 0.3682 | 0.4295 | 0.0071 | 0.0090 | 0.629 | 1.44 | 0.0122 | 0.0132 | 0.1004 | 0.1201 | 6.08 | <0.02 | 0.0671 | 2.31 | 66 |
| OREAS 464 | 0.1903 | 0.2723 | 0.994 | 1.16 | 0.0082 | 0.0104 | 1.41 | 3.23 | 0.0174 | 0.0187 | 0.2597 | 0.3138 | 4.39 | <0.03 | 0.1028 | 1.8 | 141 |
| OREAS 465 | 0.4680 | 0.6695 | 1.18 | 1.37 | 0.0106 | . | 3.81 | 8.74 | 0.0506 | 0.0545 | 0.3772 | 0.4557 | 0.43 | <0.05 | 0.1941 | (0.98) | 149 |

| Number | Se* | Si | $SiO_2$ | Sm | $Sm_2O_3$ | Sn | $SnO_2$ | Sr | SrO | Ta* | $Ta_2O_5$* | Tb* | $Tb_4O_7$* | Te* | Th | $ThO_2$ | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 460b | . | 24.01 | 51.36 | 0.0094 | 0.0109 | 0.00225 | . | 0.0287 | . | 11.7 | . | 4.34 | 5.11 | . | 0.0104 | . | 1.11 | 1.85 |
| OREAS 461 | . | 14.71 | 31.46 | 0.0220 | 0.0255 | 0.00256 | 0.00325 | 0.0579 | 0.0685 | 25.1 | 30.7 | 9.08 | 10.7 | 0.34 | 0.0210 | 0.0239 | 1.84 | 3.07 |
| OREAS 462 | . | 13.18 | 28.19 | 0.0369 | 0.0428 | 0.00292 | 0.00371 | 0.0765 | 0.0904 | 25.7 | 31.3 | 14.4 | 16.9 | 0.33 | 0.0249 | 0.0283 | 1.91 | 3.18 |
| OREAS 463 | <20 | 12.85 | 27.50 | 0.0538 | 0.0597 | 0.00314 | 0.00399 | 0.0961 | 0.1136 | 25.2 | 30.8 | 20.3 | 23.9 | 0.35 | 0.0292 | 0.0332 | 1.92 | 3.19 |
| OREAS 464 | <50 | 9.52 | 20.36 | 0.1498 | 0.1738 | 0.00459 | 0.0058 | 0.2060 | 0.2437 | 24.3 | 29.7 | 54 | 63 | 0.36 | 0.0527 | 0.0600 | 1.95 | 3.26 |
| OREAS 465 | (33.6) | 1.53 | 3.28 | 0.1361 | 0.1578 | 0.0136 | 0.0172 | 0.5204 | 0.6154 | 79 | 96 | 57 | 67 | <1 | 0.0866 | 0.0985 | 6.30 | 10.51 |

| Number | Tl* | Tm* | $Tm_2O_3$* | U* | $U_3O_8$* | V | $V_2O_5$ | W* | $WO_3$* | Y | $Y_2O_3$ | Yb* | $Yb_2O_3$* | Zn | ZnO | Zr | $ZrO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 460b | . | 0.61 | 0.70 | 3.80 | . | 0.0233 | 0.0416 | 48.8 | . | 0.0055 | 0.0070 | 3.47 | 3.95 | 0.0076 | . | 0.0415 | . | 6.08 |
| OREAS 461 | 0.1 | 0.89 | 1.02 | 4.79 | 5.65 | 0.0385 | 0.0687 | 3.88 | 4.89 | 0.0091 | 0.0116 | 4.39 | 5.00 | 0.0162 | 0.0201 | 0.0603 | 0.0815 | 0.996 |
| OREAS 462 | 0.083 | 1.2 | 1.37 | 6.15 | 7.25 | 0.0380 | 0.0679 | 3.60 | 4.53 | 0.0133 | 0.0168 | 5.51 | 6.28 | 0.0269 | 0.0335 | 0.0593 | 0.0801 | 0.771 |
| OREAS 463 | 0.094 | 1.33 | 1.8 | 7.55 | 9.26 | 0.0327 | 0.0683 | 2.45 | 4.71 | 0.0176 | 0.0229 | 5.86 | 8.00 | 0.0391 | 0.0526 | 0.0256 | 0.0778 | 0.781 |
| OREAS 464 | 0.15 | 3.56 | 4.06 | 17.6 | 20.7 | 0.0231 | 0.0412 | <6 | <7 | 0.0449 | 0.0570 | 15.7 | 17.9 | 0.1232 | 0.1533 | 0.462 | 0.0624 | 0.697 |
| OREAS 465 | 0.087 | 4.52 | 5.16 | 13.6 | 16 | 0.0534 | 0.0953 | 7.52 | 9.48 | 0.0524 | 0.0665 | 19 | 21.6 | 0.0921 | (0.1500) | 0.1880 | 0.2539 | 0.824 |

## CRM RARE EARTH ORE WITH EXTENSIVE ANALYSIS

% = mass percent, * = mg/kg GRE: 10 g AMIS, USZ: 100 g units

| Number | As* | Ba* | Be* | Ce% | Co* | Cr* | Cs* | Cu* | Dy* | Er* | Eu* | Ga* | Gd* | Hf* | Ho* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRE-06 | . | 3442 | . | **15.41** | . | . | . | . | 615 | 111 | 1773 | . | 3197 | . | 70.67 |
| USZ 25-2006 | 156 | 917 | . | **2.90** | 32.46 | . | . | 128 | 206 | 79.50 | 211 | . | 553 | . | 36.60 |
| USZ 42-2006 | 224 | 307 | . | **2.76** | 7.89 | (34) | (55) | 27.37 | 57.63 | (23.88) | 87.22 | . | (295) | . | 7.86 |
| AMIS 0356 | . | . | . | **1.116** | Cr2O3:(0.02%) | | . | . | 13 | (2.9) | 29 | . | (72.5) | . | (1.7) |
| AMIS 0304 | . | . | . | **0.8090** | Cr2O3:(0.01%) | | . | . | . | . | . | . | . | . | . |
| GRE-08 | . | 4047 | . | **0.5099** | . | . | . | . | 143 | 33.8 | 108.8 | . | 283 | . | 19.1 |
| GRE-10 | . | 8943 | . | **0.4064** | . | . | . | . | 58 | 9.4 | 57.7 | . | 150 | . | 6.2 |
| GRE-12 | . | 726 | . | **0.3216** | . | . | . | . | 16 | 2.5 | 32.8 | . | 71 | . | 1.7 |
| GRE-13 | . | 272 | . | **0.2938** | . | . | . | . | 175 | 95.2 | 6.4 | . | 193 | . | 33.5 |
| GRE-09 | . | 4509 | . | **0.2577** | . | . | . | . | 51 | 9.7 | 49.4 | . | 130 | . | 5.7 |
| GRE-11 | . | 2088 | . | **0.2331** | . | . | . | . | 67 | 17.1 | 82.7 | . | 183 | . | 8.5 |
| USZ 44-2007 | 43.7 | 95 | . | **0.10** | (13.31) | 200 | 1.05 | 13 | 165 | (112) | 8.3 | 64 | 117 | 400 | 37 |
| GRE-07 | . | 2868 | . | **0.0806** | . | . | . | . | 10 | 2.1 | 12.7 | . | 30 | . | 1.1 |
| AMIS 0275 | . | . | . | **0.0381** | Cr2O3:(0.09%) | | . | . | 22.0 | 12.4 | 3.4 | . | 25.2 | . | 4.4 |
| AMIS 0276 | . | . | . | **0.0215** | Cr2O3:(0.03%) | | . | . | 8.4 | 5.4 | (1.37) | . | 8.4 | . | 1.8 |

continued AMIS 0185 lists La by XRF and M/ICP, some informational values rounded, contains 22 other informational values

| Number | La% | Li* | Lu* | Mo* | Nb* | Nd% | Ni* | P% | Pb% | Pr% | Rb* | Sc* | Sm% | Sn% | Sr% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRE-06 | 9.14 | . | 6.81 | . | . | 7.12 | . | (8.14) | . | 1.92 | . | 114 | (0.83) | . | . |
| USZ 25-2006 | 1.93 | . | 7.64 | (23.86) | . | 0.88 | 70.80 | . | 0.11 | 0.28 | 43 | . | 0.09 | . | 2.24 |
| USZ 42-2006 | 2.11 | 21.78 | . | 34.40 | 31 | 0.65 | 13.18 | . | 0.16 | 0.23 | 67.12 | (15.17) | 0.0539 | . | 0.49 |
| AMIS 0356 | 0.8533 | . | (0.24) | . | (214) | 0.2482 | . | . | . | 0.0942 | . | (28) | 0.0159 | . | 1.848 |
| AMIS 0304 | 0.3610 | . | . | . | . | 0.3875 | . | . | . | 0.1007 | . | . | (0.0575) | . | . |
| GRE-08 | 0.1467 | . | 1.8 | . | 1040 | 0.4433 | . | 0.8979 | . | 0.0953 | . | 91 | 0.0515 | . | 0.0206 |
| GRE-10 | 0.0834 | . | 0.4 | . | 93 | 0.2914 | . | 0.8703 | . | 0.0721 | . | 33 | 0.0283 | . | 0.0723 |
| GRE-12 | 0.0928 | . | 0.2 | . | 290 | 0.2030 | . | 0.2052 | . | 0.0507 | . | 39 | 0.0180 | . | 0.0452 |
| GRE-13 | 0.1850 | . | 11.1 | . | 3061 | 0.1144 | . | 0.0344 | . | 0.0334 | . | (11) | 0.0209 | . | 0.0054 |
| GRE-09 | 0.0620 | . | 0.6 | . | 674 | 0.2065 | . | 0.6450 | . | 0.0461 | . | 59 | 0.0234 | . | 0.0540 |
| GRE-11 | 0.0523 | . | 1.2 | . | 6121 | 0.3574 | . | 0.5086 | . | 0.0601 | . | 72 | 0.0452 | . | 0.0440 |
| USZ 44-2007 | 0.0434 | 37 | . | (12.6) | (1700) | 0.0434 | (10.4) | . | 0.0149 | 0.0122 | 641 | . | 0.0120 | 0.0126 | 0.0158 |
| GRE-07 | 0.0239 | . | 0.2 | . | 415 | 0.0571 | . | 0.1700 | . | 0.0137 | . | 55 | 0.0062 | . | 0.0142 |
| AMIS 0275 | 0.0294 | . | 1.7 | . | 239 | 0.0188 | . | . | . | 0.00561 | . | (7.8) | 0.00317 | . | 0.00201 |
| AMIS 0276 | 0.00754 | . | (8.3) | . | 107 | 0.00538 | . | . | . | 0.00153 | . | (13.1) | 0.00097 | . | 0.00166 |

| Number | Ta* | Tb* | Th* | Ti% | Tm* | U* | V* | W* | Y* | Yb* | Zn% | Zr% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRE-06 | . | 229 | 1540 | Tl*:(0.53) | 10.27 | 30.22 | . | . | 1424 | 46.32 | 0.1450 | (0.0168) |
| USZ 25-2006 | . | 54.60 | 217 | . | . | . | 138.6 | . | 959 | 54.52 | 0.06 | . |
| USZ 42-2006 | . | (45) | 946 | . | . | (52) | 115 | (19) | 167 | 17.85 | 0.0469 | (0.01) |
| AMIS 0356 | . | (5) | 84 | . | 0.31 | 4.3 | . | . | 35 | (1.9) | . | . |
| AMIS 0304 | . | . | (437) | . | . | 24 | . | . | 410 | . | . | . |
| GRE-08 | 12 | 33.4 | 731 | . | 3.0 | 41.1 | . | . | 448 | 14.6 | . | 0.0111 |
| GRE-10 | (1) | 16.0 | 340 | . | 0.8 | 24.9 | . | . | 137 | 3.8 | . | 0.0082 |
| GRE-12 | 5 | 5.5 | 235 | . | 0.2 | 11.8 | . | . | 36 | 1.3 | . | 0.0117 |
| GRE-13 | 192 | 30.4 | 351 | . | 13.4 | 96.5 | . | . | 975 | 82.4 | . | 1.4326 |
| GRE-09 | 11 | 14.0 | 386 | . | 1.0 | 26.5 | . | . | 126 | 5.1 | . | 0.0135 |
| GRE-11 | 20 | 17.5 | 828 | . | 1.9 | 16.5 | . | . | 179 | 9.9 | . | 0.0573 |
| USZ 44-2007 | 123 | 25 | 202 | . | . | 57 | . | 88 | 1102 | 123 | 0.0534 | 1.58 |
| GRE-07 | 14 | 2.9 | 81 | . | 0.2 | 11.8 | . | . | 27 | 1.3 | . | 0.0061 |
| AMIS 0275 | . | 4.0 | (56.9) | . | 1.8 | 11.5 | . | . | (115) | 11.2 | . | . |
| AMIS 0276 | . | (1.4) | (34.7) | . | (0.81) | 6.9 | . | . | (46.6) | 5.4 | . | . |

continued analysis for AMIS, GRE-06 and USZ listed in mass % RExOy = Total Rare Earths

| Number | $RE_xO_y$ | $Al_2O_3$ | $CO_2$ | $CaF_2$ | CaO | F% | FeO | $Fe_2O_3$ | $H_2O-$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $SiO_2$ | $TiO_2$ | LOI | Density |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 25-2006 | 7.56 | 2.47 | 1.04 | (32.90) | 25.51 | (1.89) | 0.14 | 13.45 | (0.67) | . | 0.91 | 0.50 | 0.14 | 0.92 | 19.26 | 4.58 | 14.86 | 0.15 | 6.78 | . |
| USZ 42-2006 | 8.27 | 2.72 | 29.00 | . | 32.68 | (1.61) | (0.08) | 5.71 | (0.19) | (2.03) | 1.55 | 2.78 | 1.67 | 0.25 | 0.22 | (0.14) | 11.86 | 0.20 | 30.56 | . |
| AMIS 0356 | . | (5.84) | . | . | (15.69) | . | . | (8.02) | . | . | (0.51) | (6.00) | (0.92) | (2.75) | (2.58) | . | (28.86) | (0.33) | (20.22) | 2.99 |
| AMIS 0304 | . | (1.52) | . | . | (28.50) | . | . | (20.93) | . | . | (0.28) | (2.87) | (0.46) | (0.09) | (18.35) | . | (12.31) | (1.80) | (7.45) | 3.37 |
| USZ 44-2007 | . | 10.93 | . | (2.20) | 2.03 | (0.98) | (0.36) | 3.38 | (0.18) | (0.68) | 3.70 | (0.05) | 0.06 | 3.46 | (0.03) | . | 71.38 | 0.31 | (1.64) | . |
| AMIS 0275 | . | (26.2) | . | . | (0.4) | . | . | (9.7) | . | . | (1.9) | (0.86) | (0.15) | (0.52) | (0.08) | . | (47.6) | (0.7) | (11.0) | 2.6 |
| AMIS 0276 | . | (23.9) | . | . | (0.3) | . | . | (9.7) | . | . | (1.7) | (0.6) | (0.1) | (0.3) | (0.090) | . | (51.4) | (1.0) | (10.2) | 2.58 |

| Number | Al | Ca | Fe | K | Mg | Mn | P | S | Si | $TiO_2$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRE-06 | 1.22 | 1.88 | 14.42 | (0.08) | 0.34 | 0.7396 | . | 0.35 | 0.8388 | 0.59 | . | . |
| AMIS 0304 | 0.8070 | 20.11 | 14.73 | . | 1.67 | . | 7.88 | . | 5.81 | . | . | . |
| GRE-08 | 3.23 | 0.6 | 33.37 | . | 0.50 | 0.1329 | . | 0.07 | 14.1 | . | . | . |
| GRE-10 | 7.52 | 1.5 | 17.25 | . | 0.51 | 0.4951 | . | (0.04) | 20.3 | . | . | . |
| GRE-12 | 1.72 | 6.2 | 23.86 | . | 2.36 | 2.0561 | . | (0.03) | 12.4 | . | . | . |
| GRE-13 | 6.72 | 0.3 | 5.17 | . | 0.17 | 0.3638 | . | (0.02) | 30.1 | . | . | . |
| GRE-09 | 5.67 | 1.2 | 30.88 | . | 0.57 | 0.6617 | . | (0.03) | 12.0 | . | . | . |
| GRE-11 | 5.24 | 0.3 | 16.71 | . | 1.02 | 0.0870 | . | (0.03) | 25.1 | . | . | . |
| GRE-07 | 4.73 | 0.3 | 19.85 | . | 1.11 | 0.5917 | . | (0.03) | 22.9 | . | . | . |

## CRM RARE EARTH ORE

analysis listed in mass %

| Number | $RE_xO_y$ | $Al_2O_3$ | CaO | F- | FeO | $Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86318 | 4.30 | (14.26) | 0.29 | 0.017 | 0.20 | 2.24 | 3.60 | 5.52 | (0.11) | 0.052 | 0.66 | (0.020) | 66.90 | 0.17 | 5.43 |
| ~~NCS DC86317~~ | ~~1.83~~ | ~~16.59~~ | ~~(0.11)~~ | ~~0.15~~ | ~~0.18~~ | ~~0.71~~ | ~~4.63~~ | ~~4.03~~ | ~~0.13~~ | ~~0.10~~ | ~~0.13~~ | ~~(0.0073)~~ | ~~70.92~~ | ~~(0.018)~~ | ~~5.42~~ |
| ~~NCS DC86312~~ | ~~0.784~~ | ~~19.00~~ | ~~0.029~~ | ~~0.014~~ | ~~(0.072)~~ | ~~3.46~~ | ~~6.64~~ | ~~2.11~~ | ~~0.231~~ | ~~0.069~~ | ~~0.064~~ | ~~(0.029)~~ | ~~66.72~~ | ~~0.530~~ | ~~6.80~~ |
| ~~NCS DC86311~~ | ~~0.486~~ | ~~14.65~~ | ~~(0.031)~~ | ~~0.034~~ | ~~(0.039)~~ | ~~1.13~~ | ~~3.61~~ | ~~4.92~~ | ~~0.080~~ | ~~0.016~~ | ~~0.155~~ | ~~(0.0025)~~ | ~~74.34~~ | ~~(0.023)~~ | ~~3.70~~ |
| NCS DC86310 | 0.085 | 14.70 | (0.026) | 0.034 | 0.054 | 1.15 | 3.61 | 4.98 | 0.077 | 0.017 | 0.158 | (0.0027) | 74.55 | 0.022 | 3.77 |
| ~~NCS DC86309~~ | ~~0.092~~ | ~~19.04~~ | ~~(0.033)~~ | ~~0.016~~ | ~~(0.071)~~ | ~~3.49~~ | ~~6.64~~ | ~~2.13~~ | ~~0.229~~ | ~~0.070~~ | ~~0.062~~ | ~~0.029~~ | ~~67.28~~ | ~~0.537~~ | ~~6.73~~ |

| Number | $CeO_2$ | $Cs_2O$ | $Dy_2O_3$ | $Er_2O_3$ | $Eu_2O_3$ | $Gd_2O_3$ | $Ho_2O_3$ | $La_2O_3$ | $Li_2O$ | $Lu_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86318 | 0.053 | 0.00126 | 0.37 | 0.20 | 0.00219 | 0.25 | (0.064) | 0.23 | 0.0121 | 0.030 |
| ~~NCS DC86317~~ | ~~0.021~~ | ~~0.0148~~ | ~~0.12~~ | ~~0.068~~ | ~~0.000956~~ | ~~0.091~~ | ~~(0.023)~~ | ~~0.25~~ | ~~0.0396~~ | ~~0.00645~~ |
| ~~NCS DC86312~~ | ~~0.023~~ | ~~0.00055~~ | ~~0.021~~ | ~~0.011~~ | ~~0.00750~~ | ~~0.026~~ | ~~0.00409~~ | ~~0.277~~ | ~~0.00398~~ | ~~0.00136~~ |
| ~~NCS DC86311~~ | ~~0.00348~~ | ~~0.00178~~ | ~~0.036~~ | ~~0.022~~ | ~~0.00018~~ | ~~(0.027)~~ | ~~0.00750~~ | ~~0.011~~ | ~~0.015~~ | ~~0.00304~~ |
| NCS DC86310 | 0.00217 | 0.00177 | 0.00563 | 0.00364 | 0.000036 | 0.00324 | 0.00120 | 0.00200 | 0.015 | 0.00055 |
| ~~NCS DC86309~~ | ~~0.00915~~ | ~~0.00056~~ | ~~0.00273~~ | ~~(0.0016)~~ | ~~0.00081~~ | ~~0.00317~~ | ~~0.00057~~ | ~~0.031~~ | ~~0.00403~~ | ~~0.00020~~ |

| Number | $Nd_2O_3$ | $Pr_6O_{11}$ | $Rb_2O$ | $Sc_2O_3$ | $Sm_2O_3$ | $Tb_4O_7$ | Th | $Tm_2O_3$ | $Y_2O_3$ | $Yb_2O_3$ | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86318 | 0.40 | 0.089 | 0.0404 | 0.00072 | 0.20 | 0.055 | 0.00670 | 0.031 | 2.16 | 0.21 | 50 or 70 g |
| ~~NCS DC86317~~ | ~~0.24~~ | ~~0.066~~ | ~~0.12~~ | ~~0.00101~~ | ~~0.066~~ | ~~0.019~~ | ~~0.00210~~ | ~~0.00829~~ | ~~0.80~~ | ~~0.051~~ | ~~50 g~~ |
| ~~NCS DC86312~~ | ~~0.186~~ | ~~0.054~~ | ~~0.011~~ | ~~0.00118~~ | ~~0.033~~ | ~~0.00407~~ | ~~0.00236~~ | ~~0.00151~~ | ~~0.124~~ | ~~0.0100~~ | ~~70 g~~ |
| ~~NCS DC86311~~ | ~~0.022~~ | ~~(0.0045)~~ | ~~0.067~~ | ~~0.00089~~ | ~~0.015~~ | ~~0.00577~~ | ~~0.00390~~ | ~~0.00316~~ | ~~0.303~~ | ~~0.022~~ | ~~50 g~~ |
| NCS DC86310 | 0.00276 | 0.00063 | 0.069 | 0.00095 | 0.00157 | 0.00082 | 0.00405 | 0.00057 | 0.057 | 0.00366 | 50 g |
| ~~NCS DC86309~~ | ~~0.017~~ | ~~0.00492~~ | ~~0.012~~ | ~~0.00113~~ | ~~0.00338~~ | ~~0.00054~~ | ~~0.00245~~ | ~~0.00024~~ | ~~(0.018)~~ | ~~0.00141~~ | ~~50 g~~ |

## CRM RARE EARTH ORE

analysis listed in mass % and mg/kg * RExOy = total rare earth oxides

| Number | $RE_xO_y$% | $CeO_2$% | Dy* | Er* | $Eu_2O_3$% | $Gd_2O_3$% | Ho* | $La_2O_3$% | Lu* | $Nd_2O_3$% | $Pr_2O_3$% | Sc* | $Sm_2O_3$% | Tb* | $ThO_2$% | Tm* | $Y_2O_3$% | Yb* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS TRV | 13.82 | 6.64 | (207.1) | (41.2) | 0.042 | (0.089) | (41.5) | (4.23) | (6.7) | (1.94) | (0.71) | (22.5) | 0.22 | (82.3) | (0.29) | (14.8) | (0.048) | (21.6) |

continued analysis listed in mass % T = total

| Number | $Al_2O_3$ | BaO | $CO_2$ | CaO | F | FeO | T.$Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | T.S | $SO_3$ | $SiO_2$ | SrO | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS TRV | (0.52) | 17.02 | (16.5) | 13.54 | 1.57 | 3.61 | 8.34 | (1.24) | 0.15 | 2.27 | 1.15 | (0.07) | (0.12) | 6.05 | (13.58) | (2.47) | 5.92 | 0.079 | 17.16 |

continued analysis listed in mg/kg

| Number | Ag | As | Be | Bi | Cd | Co | Cr | Cu | Li | Mo | Ni | Pb | V | Zn | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS TRV | (6.7) | (335) | (4.2) | (72.9) | (7.5) | (26.5) | (40.6) | (41.5) | (28.8) | 71.4 | (44.0) | (332.9) | (74.2) | 767.9 | 100 g |

## CRM RARE EARTH ORE

analysis listed in mass % 100 g units

| Number | Al | Ba | C | Ca | Fe | $H_2O$ | K | Mg | Mn | Na | P | S | Si | Zr | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN REE-1 | 3.59 | 0.01001 | (0.0786) | 2.30 | (4.16) | (0.6) | 3.09 | (0.895) | (0.155) | 1.445 | 0.0261 | (0.03) | 31.36 | 1.91 | (2) |
| CAN REE-2 | 0.761 | 5.02 | (9.06) | 13.68 | 12.14 | (0.4) | (0.0172) | 6.26 | 1.316 | (0.120) | 0.461 | 1.745 | 1.377 | (0.00322) | 31.38 |
| CAN REE-3 | 4.372 | 0.00691 | (0.08) | 1.644 | 8.28 | (0.1) | 3.76 | 0.0594 | (0.313) | (2.328) | 0.0201 | (0.04) | 29.66 | 1.8660 | 0.346 |

continued analysis listed in mg/kg

| Number | Ag | As | Be | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN REE-1 | . | 124 | (590) | (0.652) | . | 3960 | 1.58 | 277 | 1.07 | 79.7 | 847 | 701 | 23.5 | (64) | 433 |
| CAN REE-2 | (1) | . | (3.31) | (2.00) | (1.11) | 9610 | 7.71 | (32.7) | (0.09) | (5.55) | 69.2 | 14.0 | 96.6 | (60) | (219) |
| CAN REE-3 | (2) | . | 82.3 | (1.171) | (4.2) | 4540 | (0.92) | 82 | 1.118 | 16.3 | 330.3 | 187.2 | 20.85 | (80) | 346 |

.

| Number | Ge | Hf | Ho | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN REE-1 | (3) | 479 | 208 | (0.2) | 1661 | (205) | (92.4) | (36.6) | 4050 | 1456 | 24.7 | 1137 | 435 | 1047 | (3.16) |
| CAN REE-2 | (7) | (0.95) | 7.87 | (1.403) | 5130 | 9.61 | (0.92) | (154) | (1060) | 3660 | (13.1) | (40.8) | 1075 | 1.22 | (0.89) |
| CAN REE-3 | . | 448 | 65.0 | (0.4) | 2121 | (60) | 21.53 | 59.7 | 1073 | 2083 | 10.83 | 534 | 550 | 887 | (0.2) |

| Number | Sc | Sm | Sn | Sr | Ta | Tb | Th | Ti | Tl | Tm | U | V | W | Y | Yb | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN REE-1 | (8) | 381 | 498 | 129 | (231) | 106.2 | 719 | (3840) | (1.85) | 106 | 137 | (9.9) | (10) | 5480 | 678 | (1870) |
| CAN REE-2 | 57.5 | 410 | 24.1 | 2300 | 1.17 | 20.3 | 737 | 1969 | (0.240) | 1.383 | 3.73 | (79) | 9.9 | 176 | (7.2) | (420) |
| CAN REE-3 | (3) | 398 | 121.1 | 133.7 | 60.7 | 55.2 | 135.5 | 3202 | (2.341) | 25.8 | (29.9) | (4) | (1) | 1.725 | 159.4 | 1499 |

## CRM RHYOLITE WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | $SiO_2$ | Al | $Al_2O_3$ | $CO_2$ | CaO | $Fe_2O_3$ | FeO | $T.Fe_2O_3$ | $H_2O$ | K | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Si | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 018 | 76.39 | . | 11.86 | . | 0.048 | LOI:(0.35) | | 1.81 | (0.18) | . | 5.17 | 0.094 | 0.0713 | 3.73 | 0.010 | . | 0.199 |
| JR-2 | 75.69 | 6.73 | 12.72 | . | 0.50 | 0.27 | 0.44 | 0.77 | +1.19 -0.22 | 3.69 | 4.45 | 0.04 | 0.112 | 3.99 | 0.012 | 35.38 | 0.07 |
| JR-1 | 75.45 | 6.79 | 12.83 | . | 0.67 | 0.35 | 0.49 | 0.89 | +1.16 -0.20 | 3.66 | 4.41 | 0.12 | 0.099 | 4.02 | 0.021 | 35.27 | 0.11 |
| ~~US RGM-2 *~~ | ~~73.4~~ | ~~7.31~~ | ~~14.0~~ | ~~.~~ | ~~1.23~~ | ~~.~~ | ~~.~~ | ~~1.86~~ | ~~.~~ | ~~3.61~~ | ~~4.35~~ | ~~0.28~~ | ~~.~~ | ~~4.14~~ | ~~(0.05)~~ | ~~34.3~~ | ~~0.25~~ |
| GBW 07113 | 72.78 | . | 12.96 | 0.52 | 0.59 | 1.14 | 1.86 | . | 1.18 | . | 5.43 | 0.16 | 0.14 | 2.57 | 0.045 | . | 0.30 |
| JR-3 | 72.76 | . | 11.90 | . | 0.093 | 2.61 | 1.86 | 4.72 | . | . | 4.29 | 0.050 | 0.083 | 4.69 | 0.017 | . | 0.21 |

continued analysis listed in mg/kg except % which is mass % and * which is ppb

| Number | Ag | As | Au* | B | Ba | Be | Bi | C | Ca% | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 018 | . | 3.9 | . | . | 3.6 | 7.1 | (0.077) | . | . | (0.09) | 127 | . | (0.23) | 41 | 4.3 | (1.3) | 9.1 | 4.4 |
| JR-2 | . | 19.2 | 0.13 | 145 | 39.5 | 3.75 | 0.62 | . | 0.36 | 0.023 | 38.8 | . | 0.46 | 3.10 | 25.0 | 1.36 | 6.63 | 4.36 |
| JR-1 | . | 16.3 | 0.25 | 117 | 50.3 | 3.34 | 0.56 | 70.8 | 0.48 | 0.026 | 47.2 | 920 | 0.83 | 2.83 | 20.8 | 2.68 | 5.69 | 3.61 |
| ~~US RGM-2 *~~ | ~~.~~ | ~~3.3~~ | ~~.~~ | ~~.~~ | ~~842~~ | ~~(2.5)~~ | ~~.~~ | ~~.~~ | ~~0.88~~ | ~~.~~ | ~~48~~ | ~~(536)~~ | ~~2~~ | ~~(4)~~ | ~~.~~ | ~~9.8~~ | ~~(3.3)~~ | ~~(2.2)~~ |
| GBW 07113 | 0.08 | 0.66 | . | 3.5 | 506 | 4.09 | 0.60 | (0.15%) | . | 0.14 | 163 | . | 2.40 | 7.3 | 3.34 | 10.9 | 8.19 | 4.31 |
| JR-3 | . | . | . | . | 65.8 | 7.6 | . | . | . | . | 327 | . | 0.98 | 3.5 | 1.0 | 2.9 | . | . |

| Number | Eu | F% | Fe% | Ga | Gd | Ge | Hf | Hg* | Ho | In | La | Li | Lu | Mg% | Mn% | Mo | Na% | Nb | Nd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 018 | 0.471 | . | . | 24.6 | 11.4 | . | 14.6 | . | 1.62 | (0.093) | 68 | 47 | 0.58 | . | . | (1.04) | . | 75 | 67.5 |
| JR-2 | 0.14 | 0.1109 | 0.54 | 17.9 | 5.83 | . | 5.14 | . | 1.39 | . | 16.3 | 79.2 | 0.88 | 0.02 | 0.087 | 3.35 | 2.96 | 18.7 | 20.4 |
| JR-1 | 0.30 | 0.0991 | 0.62 | 16.1 | 5.06 | 1.88 | 4.51 | . | 1.11 | . | 19.7 | 61.4 | 0.71 | 0.07 | 0.077 | 3.25 | 2.98 | 15.2 | 23.3 |
| ~~US RGM-2 *~~ | ~~(0.7)~~ | ~~.~~ | ~~1.30~~ | ~~16~~ | ~~3.6~~ | ~~.~~ | ~~(6.0)~~ | ~~.~~ | ~~0.8~~ | ~~.~~ | ~~25~~ | ~~(58)~~ | ~~0.4~~ | ~~0.17~~ | ~~(0.0273)~~ | ~~(2.5)~~ | ~~3.07~~ | ~~(9)~~ | ~~20~~ |
| GBW 07113 | 1.18 | 0.13 | . | 20.5 | 9.47 | 1.17 | 10.8 | 5 | 1.64 | 0.09 | 82.7 | 12.7 | 0.67 | . | . | 2.46 | . | 34.3 | 64.5 |
| JR-3 | 0.53 | . | . | 36.6 | . | . | 40.3 | . | . | . | 179 | . | 2.8 | . | . | 0.49 | . | 510 | 107 |

| Number | Ni | P% | Pb | Pr | Rb | S | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Th | Ti% | Tl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 018 | (1.1) | . | 47 | 18.5 | 274 | . | (0.16) | 2.3 | . | 14.8 | 6.2 | 4.5 | 4.2 | 1.7 | 28.9 | . | (1.14) |
| JR-2 | . | 0.005 | 21.5 | 4.75 | 303 | . | 1.51 | 5.59 | . | 5.63 | 3.51 | 8.11 | 2.29 | 1.10 | 31.4 | 0.04 | 1.85 |
| JR-1 | . | 0.009 | 19.3 | 5.58 | 257 | 13.3 | 1.19 | 5.07 | . | 6.03 | 2.86 | 29.1 | 1.86 | 1.01 | 26.7 | 0.066 | 1.56 |
| ~~US RGM-2 *~~ | ~~(4)~~ | ~~(0.02)~~ | ~~20~~ | ~~(5)~~ | ~~147~~ | ~~.~~ | ~~(0.8)~~ | ~~5~~ | ~~.~~ | ~~4~~ | ~~(4)~~ | ~~108~~ | ~~(1)~~ | ~~(0.6)~~ | ~~15~~ | ~~0.15~~ | ~~(0.9)~~ |
| GBW 07113 | 64.5 | . | 33.3 | 18.4 | 213 | 0.009% | 0.38 | 5.15 | 0.04 | 11.7 | 3.35 | 43.0 | 2.41 | 1.51 | 27.1 | . | 0.83 |
| JR-3 | . | . | 32.8 | 33.1 | 453 | . | . | 0.50 | . | 21.3 | 17.4 | 10.4 | 36.8 | 4.29 | 112 | . | . |

| Number | Tm | U | V | W | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|
| CGL 018 | 0.629 | 3.2 | 3.4 | (1.8) | 44.7 | 4 | 161 | 471 | 100 g |
| JR-2 | 0.74 | 10.9 | 3.00 | . | 51.1 | 5.33 | 27.8 | 96.3 | 20 g |
| JR-1 | 0.67 | 8.88 | 7.0 | 1.59 | 45.1 | 4.55 | 30.6 | 99.9 | 20 or 100 g |
| ~~US RGM-2 *~~ | ~~.~~ | ~~5.9~~ | ~~.~~ | ~~(2)~~ | ~~24~~ | ~~.~~ | ~~33~~ | ~~222~~ | ~~50 g~~ ~~* Provisional Analysis~~ |
| GBW 07113 | 0.73 | 4.83 | 3.8 | 1.10 | 42.5 | 4.51 | 86.3 | 403 | 50 g |
| JR-3 | . | 21.1 | 4.2 | . | 166 | 20.3 | 209 | 1494 | 100 g |

## RUTILE

# = class, where 1 = CRM and 2 = RM analysis listed in mass % except * which is mg/kg

| # | Number | $TiO_2$ | Ti | $Al_2O_3$ | CaO | $Cr_2O_3$ | Fe | $Fe_2O_3$ | MgO | Nb | $Nb_2O_5$ | $P_2O_5$ | $SiO_2$ | $V_2O_5$ | $ZrO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SRM 670 | 96.16 | . | . | . | 0.23 | . | 0.86 | . | . | . | . | 0.51 | 0.66 | 0.84 |
| 1 | SARM 166 | 93.9 | . | 0.45 | 0.11 | 0.122 | 0.60 | . | 0.022 | . | 0.31 | 0.024 | 1.90 | 0.46 | 1.08 |
| 1 | IGS 32 | . | 57.19 | . | . | . | . | . | . | (0.27) | . | . | . | . | . |

| Number | Tot.C | $K_2O$ | MnO | $Mn_3O_4$ | S | Th* | U* | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|
| SRM 670 | . | . | . | . | . | . | . | . | 90 g |
| SARM 166 | . | (0.061) | 0.016 | . | . | 43.2 | (44.2) | (0.35) | 100 g |
| IGS 32 | . | . | . | . | . | . | . | . | 45 g |

## CRM SANDSTONE

analysis listed in mass % and * mg/kg

| Number | S% | Cu% | Ag* | Re* | Units | |
|---|---|---|---|---|---|---|
| KZ 8077-94 | 0.33 | 0.11 | 10.2 | 0.14 | 100 g | last |
| KZ 8076-94 | . | 0.036 | 0.64 | 0.023 | 100 g | last |

## SANDSTONE WITH EXTENSIVE ANALYSIS

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | C(org) | C(tot) | $CO_2$ | CaO | F | FeO | T.$Fe_2O_3$ | $H_2O$+ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07106 | 90.36 | 3.52 | (0.05) | (0.10) | (0.19) | 0.30 | 0.0183 | 0.61 | 3.22 | 1.01 | 0.65 | 0.082 | . | 0.061 | . | . | 1.10 |
| UL PRI-1 | 68.60 | 10.84 | . | . | (2.62) | 2.49 | (0.0383) | (2.07) | 3.32 | . | 3.79 | 3.24 | 0.04 | 1.71 | 0.18 | 0.71 | 4.99 |
| IAG OU-8 | 54.120 | 6.548 | . | . | . | 16.711 | . | . | 1.304 | . | 2.967 | 1.879 | 0.138 | 0.677 | . | 0.244 | 15.301 |

continued analysis listed in mg/kg except * which is ng/g continued analysis listed in mg/kg except * which is ng/g

| Number | Ag | As | Au* | B | Ba | Be | Bi | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Ge | Hf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07106 | 0.062 | 9.1 | (1.8) | 34 | 143 | 0.97 | 0.18 | 0.060 | 48 | (44) | 6.4 | 20 | 1.8 | 19 | 4.1 | 2.0 | 1.02 | 5.3 | 4.5 | 1.16 | 6.6 |
| UL PRI-1 | . | (4.7) | . | (52) | 531 | 1.4 | (0.1) | . | 82 | . | 7.4 | 78 | (2.2) | (3.5) | 4.3 | (2.7) | 1.29 | (13) | 5.3 | (<5) | 10.7 |
| IAG OU-8 | . | . | . | . | 528 | 1.42 | (0.043) | . | 41.8 | . | . | (21.5) | 3.23 | 8.36 | 2.25 | 1.59 | 0.67 | 6.28 | 2.32 | (1.10) | 4.72 |

| Number | Hg | Ho | I | In | La | Li | Lu | Mn | Mo | Nb | Nd | Ni | P | Pb | Pr | Rb | S | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07106 | 0.008 | 0.75 | (0.2) | (0.026) | 21 | 11.1 | 0.30 | 155 | 0.76 | 5.9 | 21 | 16.6 | 970 | 7.6 | 5.4 | 29 | 860 | 0.60 |
| UL PRI-1 | . | (1) | . | (<1) | 38 | . | 0.41 | . | (0.7) | 13 | 36 | 21 | . | (13) | (9.5) | 90 | (357) | (0.3) |
| IAG OU-8 | . | 0.51 | . | . | 13.8 | 10.3 | 0.26 | . | . | (4.46) | 12.4 | . | . | 9.64 | 3.12 | 64.6 | . | 0.22 |

| Number | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Ti | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Class | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 07106 | 4.2 | 0.08 | 4.7 | 1.1 | 58 | 0.38 | 0.79 | 0.038 | 7.0 | 1580 | 0.36 | 0.32 | 2.1 | 33 | 1.2 | 21.5 | 1.9 | 20 | 214 | CRM | 70 g |
| UL PRI-1 | 9.7 | . | 6.6 | (2) | 88 | 1 | 0.85 | . | 11.3 | . | (0.2) | (0.39) | 2.5 | 65 | (2.2) | 25 | 2.8 | 47 | 386 | CRM | 50 g |
| IAG OU-8 | (3.63) | . | 2.42 | . | 264.4 | 0.32 | 0.36 | . | 9.5 | . | 1.01 | 0.24 | 0.74 | 29.8 | . | 16.0 | 1.66 | . | 182.7 | RM | ~35 g |

## CRM SCHIST

analysis listed in mass % UL: 50 g units UNS, VS: 100 g units US: 25 g units

| Number | $SiO_2$ | $Al_2O_3$ | Ba0 | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $Fe_2O_3T$ | $H_2O$+ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Sr0 | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDC-1~~ | ~~65.8~~ | ~~15.8~~ | ~~.~~ | ~~.~~ | ~~1.40~~ | ~~3.93~~ | ~~2.62~~ | ~~6.32~~ | ~~.~~ | ~~3.28~~ | ~~1.69~~ | ~~.~~ | ~~2.05~~ | ~~0.16~~ | ~~.~~ | ~~1.01~~ | ~~.~~ |
| VS 3191-85 | 63.40 | 16.71 | . | . | 0.09 | 4.65 | . | 7.6 | . | 3.56 | 2.52 | 0.13 | 0.08 | 0.030 | . | 1.01 | 4.54 |
| UNS MI | 62.19 | 14.54 | 0.10 | 2.13 | 1.96 | (6) | . | 6.41 | (12) | 2.15 | 3.28 | 0.25 | 3.33 | (10) | 0.016 | 0.71 | (16) |
| UL SBO1 | 55.16 | 18.24 | . | . | 1.76 | (5.61) | . | 7.15 | . | 3.55 | (1.97) | 0.18 | 0.66 | 0.17 | . | 0.94 | 9.67 |

continued analysis listed in mg/kg

| Number | Ag | As | B | Ba | Be | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDC-1~~ | ~~.~~ | ~~0.22~~ | ~~(13)~~ | ~~630~~ | ~~3~~ | ~~.~~ | ~~93~~ | ~~(32)~~ | ~~18~~ | ~~64~~ | ~~4~~ | ~~30~~ | ~~(6.7)~~ | ~~(4.1)~~ | ~~(1.7)~~ | ~~600~~ |
| VS 3191-85 | . | . | 100 | 950 | 3.5 | . | 90 | . | 27 | 70 | (7) | 46 | . | . | . | . |
| UNS MI | (0.006) | (0.007) | (0.005) | . | (0.006) | 0.0100 | . | . | 0.0120 | 0.1073 | . | 0.0438 | . | . | . | . |
| UL SBO1 | . | (32) | . | 549 | (3.2) | . | 101 | . | 22 | 116 | (6.8) | 33 | (5.1) | (3.4) | 1.64 | . |

| Number | Ga | Gd | Ge | Hf | Hg | Ho | La | Li | Lu | Mn | Mo | Nb | Nd | Ni | Pb | Pr | Rb | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDC-1~~ | ~~21~~ | ~~7~~ | ~~.~~ | ~~8.3~~ | ~~(0.2)~~ | ~~(1.5)~~ | ~~42~~ | ~~34~~ | ~~.~~ | ~~880~~ | ~~.~~ | ~~(21)~~ | ~~40~~ | ~~(38)~~ | ~~25~~ | ~~.~~ | ~~127~~ | ~~.~~ |
| VS 3191-85 | (15) | . | (2) | . | . | . | . | (60) | (0.6) | . | (1.6) | 16 | . | 45 | 15 | . | 150 | . |
| UNS MI | (0.010) | . | . | . | . | . | . | . | . | . | . | (0.003) | . | 0.0372 | 0.0945 | . | 0.0539 | 3300 |
| UL SBO1 | (23) | 6.2 | . | 5 | . | (1.3) | 48 | . | 0.49 | . | . | 17 | 42 | 60 | 27 | 11.1 | 163 | . |

| Number | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDC-1~~ | ~~0.54~~ | ~~17~~ | ~~8.2~~ | ~~3.0~~ | ~~180~~ | ~~(1.2)~~ | ~~(1.2)~~ | ~~12~~ | ~~(0.7)~~ | ~~(0.65)~~ | ~~3.1~~ | ~~102~~ | ~~(0.80)~~ | ~~.~~ | ~~(4)~~ | ~~103~~ | ~~290~~ |
| VS 3191-85 | . | 22 | . | (4) | 39 | . | . | (12) | . | . | (2) | 100 | . | 48 | 5 | 100 | 230 |
| UNS MI | . | . | . | . | . | . | . | . | . | . | . | 0.1052 | (0.003) | 0.0198 | (0.003) | 3000 | 0.1518 |
| UL SBO1 | . | 17 | 7.8 | . | 150 | 1.4 | 1 | 15.2 | . | (0.43) | 3.1 | 153 | . | 32 | 3.2 | 82 | 183 |

## RM SEDIMENT

analysis listed in mass %

| Number | $Al_2O_3$ | $CO_2$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-10 | 10.97 | . | 2.34 | 4.92 | 1.28 | 1.77 | 0.120 | 2.43 | 0.090 | 73.12 | 0.534 | (2.20) | Longmyndian Greywacke |
| IAG UoK | 6.2 | 14.94 | 16.31 | 2.1 | 1.3 | 2.9 | 0.0644 | 1.058 | 0.13 | 53.24 | 0.423 | 16.03 | Loess |

analysis listed in mg/kg

| Number | As | Ba | Be | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-10 | . | 311 | (1.1) | . | (2.8) | (38.0) | 12.0 | 34.0 | 1.68 | 22.3 | 3.65 | 2.2 | 1.00 | 12.0 | 3.7 |
| IAG UoK | 6.7 | 200.97 | 1.102 | 0.1 | . | 53 | 5.95 | 105.7 | 2.72 | 11.31 | 4.02 | 2.382 | 0.888 | 7.087 | 4.465 |

| Number | Hf | Ho | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Sm | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-10 | 3.3 | 0.75 | 18.8 | (26.0) | 0.34 | (0.98) | 7.6 | 18.7 | (17.7) | 26.9 | 4.7 | 35.9 | . | 11.3 | (3.9) | 174 |
| IAG UoK | (9.10) | 0.80 | 25.54 | 21.90 | 0.37 | (1.40) | 8.61 | 24.32 | 42.71 | 11.34 | 6.24 | 51.2 | 0.580 | (5.93) | 5.01 | 278.5 |

| Number | Ta | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-10 | 0.56 | 0.61 | 5.0 | (0.23) | 0.34 | 1.09 | 77 | . | 20.5 | 2.2 | 54 | 123 | ~35 g |
| IAG UoK | (0.73) | 0.687 | 8.111 | 0.338 | 0.339 | 2.697 | (37.56) | (1.45) | 23.18 | 2.420 | 34.4 | . | ~60 g |

## LAKE SEDIMENT - SEQUENTIAL EXTRACTION METHOD

| BCR 701, CRM 20g | Cd | Cr | Cu | Ni | Pb | Zn |
|---|---|---|---|---|---|---|
| Step 1 | 7.34 | 2.26 | 49.3 | 15.4 | 3.18 | 205 |
| Step 2 | 3.77 | 45.7 | 124 | 26.6 | 126 | 114 |
| Step 3 | 0.27 | 143 | 55.2 | 15.3 | 9.3 | 45.7 |
| Concentration | (0.13) | (62.5) | (38.5) | (41.4) | (11.0) | (95) |

## LAKE SEDIMENT WITH ACID EXTRACTION

analysis in mass % except * for mg/kg CRM, powder 20 g

| Number | Analysis | Al | As | Ba | Ca | Cd* | Co | Cr | Cu | Fe | K | La |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NIES 31 | whole material | 9.17 | (0.00139) | (0.0338) | 1.25 | (0.342) | (0.00181) | 0.00433 | 0.00531 | 5.38 | (0.991) | (0.00204) |
| NIES 31 | acid extract | . | . | . | . | (0.285) | . | (0.00337) | 0.00506 | . | . | . |

| Number | Analysis | Mg | Mn | Na | Ni | P | Pb | Sc | Sr | Ti | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NIES 31 | whole material | (0.836) | 0.0978 | 0.882 | 0.00253 | 0.0925 | 0.00251 | (0.00191) | (0.0125) | 0.442 | 0.0154 | 0.0121 |
| NIES 31 | acid extract | . | 0.0881 | . | 0.00222 | . | 0.00220 | . | . | . | 0.0133 | 0.0110 |

## CRM LAKE SEDIMENT

analysis listed in mass %

| Number | $Al_2O_3$ | C | CaO | Fe | FeO | $Fe_2O_3$ | $H_2O-$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | LOI | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLk-1 | 16.73 | . | 0.686 | . | 2.191 | 4.251 | 3.701 | 6.372 | 2.805 | 1.736 | 0.266 | 1.051 | 0.208 | 0.1052 | 57.16 | 0.668 | . | T.$Fe_2O_3$: 6.929 |
| VS 7176-95 | 14.22 | . | 7.09 | . | 3.50 | 5.39T | (0.22) | . | 1.51 | 3.12 | 0.12 | 3.11 | 0.139 | . | 62.46 | 0.76 | 1.78 | $CO_2$: (0.74) |
| VS 7126-94 | 13.57 | (2.24) | 1.85 | . | 1.60 | 7.02T | (2.15) | (4.5) | 2.21 | 2.00 | 0.40 | 1.96 | 0.345 | 0.165 | 61.07 | 0.69 | 8.34 | $SO_3$: (0.35) |
| BCR 280R | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | Al% | As | Au | B | Ba | Be | Bi | Br | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Ga |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLk-1 | . | . | 26.8 | . | . | 574 | . | . | . | . | 87.9 | 18.0 | 69.0 | 10.9 | 62.9 | 6.57 | 3.59 | 1.27 | 589 | . |
| VS 7176-95 | (0.04) | . | . | . | (12) | 530 | (1.3) | . | . | . | (41) | 17 | 158 | . | 18 | . | . | (1.4) | (380) | . |
| VS 7126-94 | (0.17) | . | 18 | (0.004) | 34 | 710 | 2.7 | . | . | . | 80 | 18 | 66 | 6 | 52 | (4.6) | (2.6) | 1.4 | 600 | 16 |
| BCR 280R | 33.4 | . | . | . | . | . | . | . | . | 0.85 | . | 16.8 | 126 | . | 53 | 1.46 | 69 | 224 | . | . |

| Number | Gd | Ge | Hf | Hg | Ho | K% | La | Li | Lu | Mg% | Mn | Mo | Na | Nb | Nd | Ni | P | Pb | Pr | Rb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLk-1 | 6.02 | . | 3.78 | . | 1.06 | . | 40.6 | . | 0.571 | . | . | . | . | 15.8 | 35.7 | 35.0 | . | 43.7 | 8.53 | 147 |
| VS 7176-95 | . | . | . | . | . | . | 19 | 8.5 | . | . | . | . | . | 10 | . | 31 | . | 14 | . | 39 |
| VS 7126-94 | (5.8) | 1.4 | 3.9 | (0.03) | (1) | . | 45 | 37 | 0.40 | . | . | 2.9 | . | 12 | 39 | 54 | . | 21 | (8) | 93 |
| BCR 280R | . | . | . | 1.46 | . | . | . | . | . | . | . | . | . | . | . | 69 | . | . | . | . |

| Number | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Th | Ti | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Units (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLk-1 | . | 15.9 | . | 7.87 | . | 67.5 | 1.57 | 1.23 | 19.5 | . | 1.17 | . | 3.83 | 117 | . | 40.0 | 3.99 | 152 | 137 | 20 or 100 |
| VS 7176-95 | . | 19 | . | . | 3.7 | 580 | . | . | . | . | . | . | . | 105 | . | 24 | 2.7 | 64 | 204 | 100 |
| VS 7126-94 | (0.95) | 13 | (0.97) | 7 | 3.2 | 266 | 0.84 | 0.9 | 12.7 | . | . | (0.42) | 12.0 | 110 | (4.3) | 30 | 2.9 | 96 | 156 | 100 |
| BCR 280R | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 224 | . | 30 |

## CRM ESTUARY AND MARINE SEDIMENT

analysis listed in mg/kg except % which is mass %

| Number | Hg | $CH_3Hg$ | Ag | Al% | As | Ba | Be | Ca% | Cd | Ce | Co | Cr | Cu | Fe% | Ga |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ERM-CC580 | 132 tot | 0.075 | . | . | . | . | . | . | . | . | . | . | . | . | . |
| ~~NMIJ 7302a~~ | ~~0.52~~ | ~~.~~ | ~~0.49~~ | ~~.~~ | ~~22.1~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.32~~ | ~~.~~ | ~~12.4~~ | ~~145~~ | ~~57.8~~ | ~~.~~ | ~~.~~ |
| BCR 277R | 0.128 | . | . | . | 18.3 | . | . | . | 0.61 | . | 22.5 | 188 | 63 | . | . |
| ~~NMIJ 7303a~~ | ~~0.067~~ | ~~.~~ | ~~0.098~~ | ~~.~~ | ~~8.6~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.342~~ | ~~.~~ | ~~11.1~~ | ~~39.1~~ | ~~23.1~~ | ~~.~~ | ~~.~~ |
| SRM 1646a | (0.04) | . | (<0.3) | 2.297 | 6.23 | (210) | (<1) | 0.519 | 0.148 | (34) | (5) | 40.9 | 10.01 | 2.008 | (5) |

| Number | K% | La | Li | Mg% | Mn | Mo | Na% | Nd | Ni | P% | Pb | Rb | S% | Sb | Sc | Se |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ERM-CC580 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| ~~NMIJ 7302a~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.98~~ | ~~.~~ | ~~.~~ | ~~25.8~~ | ~~.~~ | ~~82.7~~ | ~~.~~ | ~~.~~ | ~~1.22~~ | ~~.~~ | ~~0.61~~ |
| BCR 277R | . | . | . | . | . | . | . | . | 130 | . | . | . | . | . | . | . |
| ~~NMIJ 7303a~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.96~~ | ~~.~~ | ~~.~~ | ~~21.8~~ | ~~.~~ | ~~31.3~~ | ~~.~~ | ~~.~~ | ~~0.69~~ | ~~.~~ | ~~0.24~~ |
| SRM 1646a | 0.864 | (17) | (18) | 0.388 | 2345 | . | 0.741 | (15) | 22.5 | 0.027 | 11.7 | (38) | 0.352 | (0.3) | (5) | 0.193 |

| Number | Si% | Sn | Sr | Th | Ti% | Tl | U | V | Zn | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| ERM-CC580 | . | . | . | . | . | . | . | . | . | 40 g |
| ~~NMIJ 7302a~~ | ~~.~~ | ~~18.5~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~401~~ | ~~60 g~~ |
| BCR 277R | . | . | . | . | . | . | . | . | 178 | 40 g |
| ~~NMIJ 7303a~~ | ~~.~~ | ~~4.21~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~107~~ | ~~60 g~~ |
| SRM 1646a | 40.0 | (1) | (68) | (5.8) | 0.456 | (<0.5) | (2) | 44.84 | 48.9 | 70 g |

## CRM MARINE SEDIMENT

analysis listed in mass % T = Total

| Number | $Al_2O_3$ | C(org) | T.C | $CO_3^{2-}$ | CaO | FeO | $Fe_2O_3$ | T.$Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JMs-1 | 15.82 | . | 1.69 | . | 2.13 | 2.12 | 4.54 | 6.90 | 6.79 | 2.24 | 2.87 | 0.102 | 4.07 | 0.18 | 1.32T | 53.74 | 0.70 | 15.44 |
| JMs-2 | 14.18 | . | 0.39 | . | 4.68 | <0.04 | 10.96 | 10.96 | 7.13 | 2.70 | 3.24 | 2.26 | 5.79 | 1.26 | 0.29T | 41.78 | 1.40 | 19.15 |
| | Al | | | | Ca | | | Fe | | K | Mg | Mn | Na | P | | Si | Ti | |
| ~~SRM 2702~~ | ~~8.41~~ | ~~(3.27)~~ | ~~(3.36)~~ | ~~.~~ | ~~(0.343)~~ | ~~.~~ | ~~.~~ | ~~7.91~~ | ~~.~~ | ~~2.054~~ | ~~(0.990)~~ | ~~0.1757~~ | ~~0.681~~ | ~~0.1552~~ | ~~(1.5T)~~ | ~~.~~ | ~~0.884~~ | ~~.~~ |
| SRM 2703 | 8.33 | . | . | . | (0.31) | . | . | 7.38 | . | 2.08 | (1.0) | 0.1734 | 0.693 | (0.16) | . | . | 0.880 | . |
| NRC MESS-4 | 7.91 | . | (1.79) | . | 1.31 | . | . | 3.79 | . | 2.38 | 1.58 | 0.0298 | 1.26 | 0.104 | 0.158 | 27.8 | 0.384 | . |
| NRC PACS-3 | 6.58 | . | . | . | 1.89 | . | . | 4.106 | . | 1.253 | 1.402 | 0.0432 | 3.52 | 0.0937 | 1.17 | 26.1 | 0.442 | . |
| NRC HISS-1 | 0.73 | . | . | . | 1.14 | . | . | 0.246 | . | 0.332 | 0.075 | 0.00661 | 0.373 | . | . | (44) | 0.076 | . |
| BCR 320R | . | . | . | . | . | . | . | 2.5700 | . | . | . | 0.0910 | . | . | . | . | . | . |

continued analysis listed in mg/kg except % which is mass % SRM 2703 is intended for small sample techniques <10mg

| Number | Ag | As | B | Ba% | Be | Bi | Br | Cd | Ce | Cl% | Co | Cr | Cs | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JMs-1 | . | 18 | 81 | 0.0307 | 1.3 | . | . | . | . | 2.69 | 18.1 | 133 | 5.9 | 88 | . | . | . |
| JMs-2 | . | 35 | 106 | 0.1856 | 1.8 | . | . | . | . | 4.05 | 226 | 78 | 3.0 | 447 | . | . | . |
| ~~SRM 2702~~ | ~~(0.622)~~ | ~~45.3~~ | ~~.~~ | ~~0.03974~~ | ~~(3.0)~~ | ~~.~~ | ~~.~~ | ~~0.817~~ | ~~123.4~~ | ~~.~~ | ~~27.76~~ | ~~352~~ | ~~(7.1)~~ | ~~(117.7)~~ | ~~.~~ | ~~.~~ | ~~.~~ |
| SRM 2703 | (0.59) | 45.5 | . | 0.0416 | . | . | . | 0.811 | 125.5 | . | 27.70 | . | (7.7) | (120) | . | . | . |
| NRC MESS-4 | 0.161 | 21.7 | | (0.0920) | 2.09 | (2.7) | (60) | 0.28 | (72) | 1.31% | 13.0 | 94.3 | (10) | 32.9 | . | . | (1.3) |
| NRC PACS-3 | (1.10) | 30.3 | | . | 1.06 | . | . | 2.23 | . | . | (12.1) | 90.6 | . | 326 | . | . | . |
| NRC HISS-1 | 0.016 | 0.801 | . | . | 0.129 | . | . | 0.024 | . | (0.35) | (0.65) | 30.0 | . | 2.29 | . | . | . |
| BCR 320R | . | 21.7 | . | . | . | . | . | 2.64 | . | . | 9.7 | 59 | . | 46.3 | . | . | . |

| Number | Ga | Gd | Hf | Hg | Ho | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JMs-1 | . | . | . | . | . | 0.101 | . | 62 | . | . | . | . | 53 | 49 | . | 88 | 1.4 | . |
| JMs-2 | . | . | . | . | . | 0.178 | . | 43 | . | . | . | . | 311 | 88 | . | 65 | 4.5 | . |
| ~~SRM 2702~~ | ~~(24.3)~~ | ~~.~~ | ~~(12.6)~~ | ~~0.4474~~ | ~~.~~ | ~~.~~ | ~~73.5~~ | ~~(78.2)~~ | ~~.~~ | ~~(10.8)~~ | ~~(63)~~ | ~~(56)~~ | ~~75.4~~ | ~~132.8~~ | ~~.~~ | ~~127.7~~ | ~~5.60~~ | ~~25.9~~ |
| SRM 2703 | . | . | (11.8) | 0.474 | . | . | 75.9 | . | . | (11) | (63) | (72) | (75) | 130 | . | 130 | 5.62 | 25.95 |
| NRC MESS-4 | (18) | Ge:(0.16) | (3.0) | (0.08) | . | (0.10) | (35) | 65.3 | (0.11) | (2.53) | (12) | (42) | 42.8 | 21.5 | . | (180) | 1.07 | (13.4) |
| NRC PACS-3 | . | . | . | 2.98 | . | . | . | 31.9 | . | (5.9) | . | . | 39.5 | 188.0 | . | . | 14.7 | . |
| NRC HISS-1 | . | . | . | (0.01) | . | . | . | 2.83 | . | (0.13) | . | . | 2.16 | 3.13 | . | . | (0.13) | . |
| BCR 320R | . | . | . | 0.85 | . | . | . | . | . | . | . | . | 27.1 | 85 | . | . | . | 5.2 |

* BUTILYN CONTENT DETAILED ON CERTIFICATES

| Number | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | Units | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JMs-1 | . | . | . | 154 | . | . | 0.132 | . | . | . | . | 127 | . | 24.3 | . | 264 | 132 | 100 g | |
| JMs-2 | . | . | . | 454 | . | . | 1.38 | . | . | . | . | 183 | . | 254 | . | 166 | 220 | 100 g | |
| ~~SRM 2702~~ | ~~(4.95)~~ | ~~(10.8)~~ | ~~31.6~~ | ~~119.7~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~20.51~~ | ~~0.8267~~ | ~~.~~ | ~~(10.4)~~ | ~~357.6~~ | ~~(6.2)~~ | ~~.~~ | ~~.~~ | ~~485.3~~ | ~~.~~ | ~~50 g~~ | |
| SRM 2703 | (4.9) | (10.8) | (32) | (118) | . | . | . | 20.22 | (0.83) | . | 8.99 | 360 | (6.4) | . | . | 480 | . | 5 g | last |
| NRC MESS-4 * | (1.5) | (5.5) | 2.35 | 132 | (1) | . | (0.1) | (12) | 0.85 | . | 3.4 | 216 | (1.3) | (20) | (2) | 147 | (96) | 50 g | Re:(0.004) |
| NRC PACS-3 * | . | . | 22.0 | 267 | . | . | . | . | . | . | (2.6) | 129 | . | . | . | 376 | . | 50 g | |
| NRC HISS-1 | 0.050 | . | (0.11) | 96.9 | . | . | . | (0.06) | . | . | (0.26) | 6.80 | . | . | . | 4.94 | . | 100 g | |
| BCR 320R | . | . | . | . | . | . | . | 5.3 | 0.65 | . | 1.56 | 46.5 | . | . | . | 319 | . | 40 g | |

## RIVER SEDIMENT

analysis listed in mg/kg except % which is mass % ~~SRM 1944: CRM, 50 g~~ SRM 8704: RM, 50 g

| Number | Ag | Al% | As | Au | Ba | Be | Br | C% | Ca% | Cd | Ce | Cl% | Co | Cr | Cs | Cu | Eu | Hf | Hg | Fe |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1944~~ | ~~6.4~~ | ~~5.33~~ | ~~18.9~~ | ~~(0.1)~~ | ~~.~~ | ~~1.6~~ | ~~86~~ | ~~.~~ | ~~1.0~~ | ~~8.8~~ | ~~(65)~~ | ~~1.4~~ | ~~14~~ | ~~266~~ | ~~3~~ | ~~380~~ | ~~(1.3)~~ | ~~.~~ | ~~3.4~~ | ~~3.53%~~ |
| SRM 8704 | . | 6.10 | (17) | . | 413 | . | . | 3.351 | 2.641 | 2.94 | 66.5 | . | 13.57 | 121.9 | 5.83 | . | 1.31 | 8.4 | . | 3.97% |

continued

| Number | K% | Mg% | Mn | Na% | Ni | Pb | Rb | Sb | Sc | Se | Si% | Sn | Th | Ti% | Tl | U | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SRM 1944~~ | ~~1.6~~ | ~~(1.0)~~ | ~~505~~ | ~~1.9~~ | ~~76.1~~ | ~~330~~ | ~~75~~ | ~~(5)~~ | ~~10.2~~ | ~~1.4~~ | ~~31~~ | ~~42~~ | ~~(13)~~ | ~~0.4300~~ | ~~0.59~~ | ~~(3.1)~~ | ~~100~~ | ~~656~~ |
| SRM 8704 | 2.001 | 1.200 | 544 | 0.553 | 12.9 | 150 | . | 3.07 | 11.26 | . | . | . | 9.07 | 0.457 | . | 3.09 | 94.6 | 408 |

## CRM STREAM SEDIMENT

analysis listed in mass % BCR: 40 g JSd 1-3: 20 g Jsd-4: 100 g SARM: 100 g units

| Number | $SiO_2$ | $Al_2O_3$ | Org.C | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $T.Fe_2O_3$ | $H_2O+$ | $H_2O-$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSd-3 | 76.00 | 9.908 | . | . | 0.560 | 1.161 | 3.057 | 4.368 | 2.838 | 0.964 | 1.971 | 1.17 | 0.149 | 0.411 | 0.0817 | 0.403 | . |
| JSd-1 | 66.55 | 14.65 | . | (0.0867) | 3.034 | 1.363 | 3.526 | 5.059 | (2.301) | 0.836 | 2.183 | 1.813 | 0.0924 | 2.727 | 0.122 | 0.643 | . |
| JSd-2 | 60.78 | 12.31 | . | (0.501) | 3.658 | 5.955 | 4.552 | 11.65 | 2.554 | 0.451 | 1.145 | 2.731 | 0.120 | 2.438 | 0.105 | 0.614 | . |
| JSd-4 | 51.12 | 13.22 | . | . | 5.57 | (2.08) | . | 8.06 | . | . | 1.40 | 4.04 | 0.107 | 2.28 | 0.45 | 0.64 | . |
| SARM 46 | 35.90 | 6.71 | . | . | 1.32 | (18.0) | 28.16 | . | . | . | 0.35 | 3.16 | 1.14 | 0.28 | 0.11 | 0.60 | . |
| BCR 667 | **estuary sediment** | | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

continued analysis listed in mg/kg except * which is ng/g and % which is mass %

| Number | Ag | As | Au* | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Fe |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSd-3 | (3.38) | 252 | (5.66) | . | 462 | . | . | . | . | 42.0 | . | 12.7 | 35.3 | 30.6 | 426 | 2.22 | 1.07 | 0.686 | 3200 | . |
| JSd-1 | (0.036) | 2.42 | (0.64) | . | 520 | 1.40 | . | . | . | 34.4 | . | 11.2 | 21.5 | 1.89 | 22.0 | 2.23 | 0.906 | 0.925 | 306 | . |
| JSd-2 | (1.04) | 38.6 | (54.6) | . | 1199 | . | . | . | . | 23.4 | . | 48.4 | 108 | 1.07 | 1117 | 2.86 | 1.48 | 0.81 | 259 | . |
| JSd-4 | . | . | . | . | (888) | . | . | . | . | . | . | (21) | (1215) | . | (486) | . | . | . | . | . |
| SARM 46 | . | . | . | . | (180) | . | . | . | . | (110) | . | 56 | 559 | 566 | . | . | . | . | . | . |
| BCR 667 | . | . | . | . | . | . | . | (99.7) | (0.67) | 56.7 | . | (23.0) | (178) | (7.8) | (60) | 4.01 | 2.35 | 1.00 | . | (44.48) |

continued

| Number | Gd | Ge | Hf | Hg* | Ho | I | In | La | Li | Lu | Mn | Mo | Nb | Nd | Ni | P | Pb | Pr | Rb | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSd-3 | . | . | 3.21 | (254) | . | . | . | 19.8 | 151 | 0.196 | . | . | 7.80 | 15.7 | 19.6 | . | 82.1 | 3.09 | 285 | (399) |
| JSd-1 | 2.71 | . | 3.55 | (15.5) | . | . | . | 18.1 | 22.8 | 0.186 | . | . | 11.1 | 17.6 | 7.04 | . | 12.9 | 4.05 | 67.4 | (68) |
| JSd-2 | . | . | 2.70 | (106) | . | . | . | 11.3 | (19.2) | 0.252 | . | 11.5 | 4.56 | 13.2 | 92.8 | . | 146 | 2.40 | 26.9 | 1.31% |
| JSd-4 | . | . | . | . | . | . | . | (16) | (32) | . | . | . | . | . | (114) | . | (240) | . | (57) | . |
| SARM 46 | . | . | . | . | . | . | . | . | . | . | . | (10) | . | . | (125) | . | (1.3) | . | (20) | (0.17%) |
| BCR 667 | 4.41 | . | . | . | 0.80 | . | . | 27.8 | . | 0.325 | (920) | . | . | 25.0 | (128) | . | (31.9) | 6.1 | . | . |

continued

| Number | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Ti% | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSd-3 | . | 10.5 | . | 3.26 | . | 58.7 | 0.687 | 0.368 | . | 7.79 | . | . | . | 1.66 | 70.4 | . | 14.9 | 1.40 | 136 | 124 |
| JSd-1 | . | 10.9 | . | 3.48 | . | 340 | 0.893 | 0.431 | . | 4.44 | . | . | . | 1.00 | 76.0 | . | 14.8 | 1.18 | 96.5 | 132 |
| JSd-2 | . | 17.5 | . | 2.68 | . | 202 | . | 0.440 | . | 2.33 | . | . | . | 1.10 | 125 | . | 17.4 | 1.67 | 2056 | 111 |
| JSd-4 | . | (17) | . | . | . | (220) | . | . | . | . | . | . | . | . | (152) | . | (21) | . | (1485) | (90) |
| SARM 46 | . | . | . | . | . | 25 | . | . | . | . | . | . | . | . | 225 | . | (20) | . | 0.59% | 101 |
| BCR 667 | (0.96) | 13.7 | (1.59) | 4.66 | . | . | (0.876) | 0.682 | . | 10.0 | . | . | 0.326 | 2.26 | . | . | . | 2.20 | (175) | . |

## CRM STREAM SEDIMENT

analysis listed in mass % DC730xx: 70 g units

| Number | $SiO_2$ | $Al_2O_3$ | C | C.Org | $CO_2$ | CaO | FeO | $Fe_2O_3T$ | $H_2O+$ | $K_2O$ | MgO | Mn | N | $Na_2O$ | P | S | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73017 | 77.42 | 11.44 | (0.25) | 0.20 | (0.11) | 0.85 | (0.2) | 1.86 | (1.0) | 3.89 | 0.18 | 0.122 | 0.0218 | 2.53 | 0.0234 | 0.0066 | 0.151 |
| NCS DC73015 | 74.33 | 11.65 | (0.46) | (0.08) | (1.34) | 2.85 | (0.57) | 1.79 | 0.98 | 2.96 | 0.71 | 0.0290 | (0.0079) | 2.85 | 0.0335 | 0.0087 | 0.146 |
| NCS DC73014 | 69.40 | 11.06 | (0.48) | 0.28 | (0.76) | 2.96 | (1.83) | 7.00 | 2.31 | 2.35 | 1.70 | 0.142 | (0.0150) | 1.40 | 0.0568 | 0.0432 | 0.32 |
| NCS DC73018 | 66.02 | 11.25 | 1.01 | 0.34 | 2.57 | 3.82 | (2.1) | 6.31 | 3.23 | 2.41 | 2.34 | 0.0798 | 0.0291 | 0.83 | 0.0459 | 0.0110 | 0.53 |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Ga |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73017 | 0.044 | 4.4 | 5.5 | 1054 | 1.6 | 0.33 | 1.0 | 0.095 | 32 | (30) | 12.5 | 8.4 | 1.5 | 3.9 | 1.3 | 0.8 | 0.54 | 131 | 12.0 |
| NCS DC73015 | 0.050 | 3.6 | 48 | 600 | 3.6 | 0.48 | 0.61 | 0.093 | 24 | 33 | 4.4 | 21 | 7.2 | 7.2 | 1.7 | 0.93 | 0.62 | 279 | 12.4 |
| NCS DC73014 | 0.14 | 14.3 | 53 | 455 | 2.2 | 0.51 | 0.8 | 0.34 | 47 | 53 | 10.2 | 61 | 5.8 | 132 | 4.1 | 2.5 | 1.20 | 550 | 14.6 |
| NCS DC73018 | 0.092 | 3.0 | 14 | 567 | 1.9 | 0.22 | 1.0 | 0.12 | 90 | 62 | 19.5 | 79 | 4.6 | 43 | 6.5 | 3.7 | 1.4 | 664 | 16.5 |

| Number | Gd | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73017 | 1.4 | 1.21 | 2.7 | 0.016 | 0.26 | 0.46 | (0.014) | 11.8 | 8.1 | 0.14 | 0.64 | 9.5 | 8.9 | 4.7 | 22 | 2.5 | 81 | 0.29 | 2.1 |
| NCS DC73015 | 1.7 | 1.64 | 2.1 | (0.007) | 0.33 | 0.27 | 0.018 | 13.9 | 40 | 0.16 | 0.33 | 5.1 | 9.8 | 7.0 | 31 | 2.9 | 118 | 0.16 | 4.9 |
| NCS DC73014 | 4.1 | 1.87 | 3.8 | 0.018 | 0.83 | 0.47 | 0.14 | 24 | 20.7 | 0.42 | 0.94 | 9.4 | 22 | 18.9 | 210 | 5.9 | 96 | 1.18 | 11.4 |
| NCS DC73018 | 7.0 | 1.45 | 7.8 | (0.014) | 1.27 | 0.4 | 0.068 | 45 | 43 | 0.60 | 0.84 | 15.3 | 40 | 70 | 19 | 11.0 | 121 | 0.15 | 16.9 |

| Number | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73017 | 0.072 | 1.6 | (1.0) | 167 | 0.81 | 0.22 | (0.03) | 5.4 | 0.44 | 0.13 | 1.1 | 28 | 0.58 | 7.0 | 0.83 | 19 | 100 | last |
| NCS DC73015 | 0.053 | 1.9 | 2.3 | 253 | 0.72 | 0.29 | (0.02) | 4.1 | 0.83 | 0.16 | 1.9 | 31 | 0.66 | 9.7 | 1.0 | 27 | 71 | |
| NCS DC73014 | 0.47 | 4.5 | 2.5 | 171 | 0.65 | 0.68 | (0.05) | 8.3 | 0.91 | 0.40 | 2.2 | 77 | 2.0 | 23 | 2.6 | 209 | 132 | |
| NCS DC73018 | 0.24 | 7.5 | 1.9 | 117 | 1.04 | 1.14 | (0.05) | 15.4 | 0.77 | 0.59 | 3.5 | 120 | 1.7 | 34 | 3.8 | 74 | 275 | |

## CRM STREAM SEDIMENT

analysis listed in mass % T = total Fe reported

| Number | $Al_2O_3$ | Ba | CaO | $Cr_2O_3$ | Cu | FeO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Pb | S | $SiO_2$ | $TiO_2$ | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 52 | 9.38 | (0.0410) | 0.37 | 0.19 | 0.0219 | (4.0) | 19.71 | 0.25 | 0.60 | 0.27 | (0.1) | 0.09 | 0.12 | (0.02) | 57.81 | 1.30 | 0.0264 | 0.0250 |

continued analysis listed in mg/kg except % for mass %

| Number | Ce | Co | Ga | Nb | Ni | Rb | Sr | Th | V | Y | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 52 | (210) | 81 | (15) | 11 | 182 | 20 | 25 | (11) | 346 | 20 | 100 g |

## CRM SEDIMENT

analysis listed in mass % 348x series: 100 g units 536x series: 50 g units

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3$ | T.$Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 3486-86 | 70.54 | 11.29 | . | 0.52 | . | (3.5) | 5.24 | 2.21 | 0.48 | 0.11 | 1.67 | 0.28 | 0.43 | 0.62 | . |
| VS 5361-90 | 70.5 | 11.31 | . | 0.48 | 1.3 | . | 5.24 | 2.23 | 0.49 | 0.105 | 1.65 | 0.27 | 0.44 | 0.61 | 5.5 |
| VS 5365-90 | 60.4 | 16.49 | 0.13 | 0.40 | 3.3 | . | 8.80 | 2.44 | 1.62 | 0.132 | 1.57 | 0.19 | 0.03 | 0.98 | 6.8 |
| VS 5363-90 | 51.9 | 16.65 | . | 1.11 | 2.2 | . | 6.28 | 2.50 | 1.54 | 0.070 | 1.34 | 0.19 | 0.04 | 0.83 | 17.1 |
| VS 5362-90 | 45.4 | 11.58 | . | 7.04 | 1.5 | . | 4.59 | 2.96 | 5.72 | 0.074 | 0.85 | 0.14 | 0.04 | 0.63 | 20.3 |
| VS 3485-86 | 25.07 | 5.03 | . | 17.76 | (0.24) | (0.2) | 10.59 | 1.13 | 11.70 | 0.50 | 0.61 | 1.82 | 0.05 | 0.27 | (25.14) |
| VS 5364-90 | 25.0 | 4.98 | 21.6 | 17.83 | 0.4 | . | 10.56 | 1.13 | 11.7 | 0.48 | 0.63 | 1.82 | 0.05 | 0.26 | 25.1 |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As% | Au | B% | Ba% | Be% | Bi% | Cd | Ce | Co | Cr | Cs | Cu% | F% | Ga | Ge | La% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 3486-86 | . | . | . | 0.016 | 0.039 | 0.00036 | . | 9 | . | 9 | 0.0076 | . | 0.025 | . | 16 | . | 0.0032 |
| VS 5361-90 | 35 | 0.8 | 0.11 | 0.015 | 0.038 | 0.004 | 0.009 | 9 | 0.004 | 9.0 | 0.0075 | 17 | 0.025 | 0.21 | 16 | 15 | 0.0030 |
| VS 5365-90 | . | . | . | 0.007 | 0.055 | 0.0003 | . | . | 0.006 | 29 | 0.013 | 4 | 0.0049 | . | 17 | . | 0.0032 |
| VS 5363-90 | 0.10 | 0.004 | 0.016 | 0.008 | 0.050 | 0.00021 | . | . | . | 17 | 0.012 | 6 | 0.0050 | 0.09 | 17 | 12 | 0.0029 |
| VS 5362-90 | 0.06 | . | 0.03 | 0.008 | 0.050 | 0.00020 | . | . | 0.005 | 13 | 0.0065 | 4 | 0.0044 | 0.12 | 12 | 12 | 0.0030 |
| VS 3485-86 | 2.6 | (0.009) | 1.3 | (0.0014) | 0.035 | 0.00025 | . | (3.5) | . | 11 | 0.0028 | . | 0.026 | . | 9 | . | 0.026 |
| VS 5364-90 | 2.3 | 0.006 | 1.2 | 0.0013 | 0.034 | 0.0003 | 0.0006 | 3 | 0.05 | 12 | 0.0029 | 4 | 0.024 | 0.19 | 8 | 16 | 0.022 |

| Number | Li% | Mo | Nb | Ni | Pb% | Rb% | Sb% | Sc | Sn% | Sr% | V% | W% | Y% | Yb | Zn% | Zr% | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 3486-86 | 0.015 | . | 17 | 25 | 0.011 | 0.019 | 0.017 | 8 | 0.04 | 0.020 | 0.006 | . | 0.0016 | 2.24 | 0.039 | 0.021 | |
| VS 5361-90 | 0.014 | 2.7 | 17 | 24 | 0.010 | 0.019 | 0.015 | 8 | 0.040 | 0.018 | 0.0058 | 0.20 | 0.0018 | 2.5 | 0.039 | 0.020 | |
| VS 5365-90 | 0.007 | 2.1 | 13 | 72 | 0.0024 | 0.0080 | . | 18 | 0.00036 | 0.013 | 0.018 | . | 0.0030 | 4 | 0.012 | 0.021 | Nd: 25, Sm: 4 |
| VS 5363-90 | 0.006 | 1.1 | 10 | 55 | 0.0015 | 0.0095 | . | 16 | 0.00040 | 0.019 | 0.014 | . | 0.0023 | 3 | 0.0086 | 0.018 | |
| VS 5362-90 | 0.009 | 1.0 | 12 | 31 | 0.0014 | 0.0085 | . | 11 | 0.00040 | 0.025 | 0.0087 | . | 0.0020 | 2.6 | 0.0054 | 0.015 | |
| VS 3485-86 | 0.0020 | 29 | (7) | 19 | (0.020) | 0.004 | . | 9 | 0.0004 | 0.018 | 0.007 | . | 0.004 | 3.3 | 0.014 | 0.007 | |
| VS 5364-90 | 0.0020 | 27 | 7 | 18 | 0.015 | 0.0045 | . | 7 | 0.00033 | 0.017 | 0.0075 | 0.0025 | 0.0040 | 2.9 | 0.014 | 0.007 | Th: 40 |

## CRM SEDIMENT

analysis listed in mass % M2: 85 g others: 80 g units

| Number | $Al_2O_3$ | Ba | Tot.C | CaO | T.$Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Pb | S | $SiO_2$ | $TiO_2$ | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDAR-M2~~ | ~~12.47~~ | ~~0.0990~~ | ~~.~~ | ~~0.84~~ | ~~2.63~~ | ~~5.00~~ | ~~(0.49)~~ | ~~0.134~~ | ~~2.58~~ | ~~(0.079)~~ | ~~0.0808~~ | ~~(0.0970)~~ | ~~73.45~~ | ~~0.300~~ | ~~0.0760~~ | ~~(1.6)~~ |
| ~~US SDAR-H1~~ | ~~11.83~~ | ~~0.0866~~ | ~~(0.9)~~ | ~~1.46~~ | ~~6.45~~ | ~~4.17~~ | ~~1.53~~ | ~~0.515~~ | ~~(1.1)~~ | ~~0.185~~ | ~~0.3890~~ | ~~.~~ | ~~65.45~~ | ~~0.560~~ | ~~0.3680~~ | ~~.~~ |
| ~~US SDAR-L2~~ | ~~11.58~~ | ~~0.0809~~ | ~~(0.1500)~~ | ~~1.06~~ | ~~3.63~~ | ~~4.10~~ | ~~(0.43)~~ | ~~0.099~~ | ~~2.66~~ | ~~0.080~~ | ~~0.0183~~ | ~~.~~ | ~~74.48~~ | ~~0.620~~ | ~~0.0201~~ | ~~(0.94)~~ |

continued analysis listed in mg/kg

| Number | Ag | As | Be | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Ge | Hf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDAR-M2~~ | ~~(15)~~ | ~~(76)~~ | ~~6.6~~ | ~~1.05~~ | ~~5.1~~ | ~~98.8~~ | ~~12.4~~ | ~~49.6~~ | ~~1.82~~ | ~~236~~ | ~~5.88~~ | ~~3.58~~ | ~~1.44~~ | ~~17.6~~ | ~~6.28~~ | ~~(1.5)~~ | ~~7.29~~ |
| ~~US SDAR-H1~~ | ~~(76)~~ | ~~(396)~~ | ~~(22)~~ | ~~(5.1)~~ | ~~(25)~~ | ~~89.3~~ | ~~55.6~~ | ~~.~~ | ~~4.78~~ | ~~1160~~ | ~~4.41~~ | ~~2.60~~ | ~~1.25~~ | ~~15.6~~ | ~~5.35~~ | ~~.~~ | ~~(6.9)~~ |
| ~~US SDAR-L2~~ | ~~(3.2)~~ | ~~16.9~~ | ~~3.38~~ | ~~0.26~~ | ~~(1.2)~~ | ~~140~~ | ~~5.41~~ | ~~26.0~~ | ~~1.14~~ | ~~50.8~~ | ~~9.83~~ | ~~5.98~~ | ~~1.44~~ | ~~17.0~~ | ~~9.73~~ | ~~(1.6)~~ | ~~(16)~~ |

| Number | Hg | Ho | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pr | Rb | Sb | Sc | Se | Sm | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDAR-M2~~ | ~~1.44~~ | ~~1.21~~ | ~~(2.1)~~ | ~~46.6~~ | ~~17.9~~ | ~~0.54~~ | ~~13.3~~ | ~~26.2~~ | ~~39.4~~ | ~~48.8~~ | ~~11.0~~ | ~~149~~ | ~~(107)~~ | ~~4.1~~ | ~~(2.7)~~ | ~~7.18~~ | ~~(2.4)~~ |
| ~~US SDAR-H1~~ | ~~(7.3)~~ | ~~0.900~~ | ~~(9.5)~~ | ~~44.9~~ | ~~50.5~~ | ~~0.398~~ | ~~64~~ | ~~21.9~~ | ~~36.2~~ | ~~230~~ | ~~9.97~~ | ~~152~~ | ~~(505)~~ | ~~(8.2)~~ | ~~(15)~~ | ~~6.39~~ | ~~(2.9)~~ |
| ~~US SDAR-L2~~ | ~~(0.33)~~ | ~~2.08~~ | ~~(0.47)~~ | ~~67.9~~ | ~~11.8~~ | ~~0.93~~ | ~~3.66~~ | ~~63.0~~ | ~~60.3~~ | ~~14.3~~ | ~~16.2~~ | ~~120~~ | ~~21.8~~ | ~~5.6~~ | ~~(0.9)~~ | ~~11.5~~ | ~~(3.2)~~ |

| Number | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zr | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~US SDAR-M2~~ | ~~144~~ | ~~1.8~~ | ~~0.97~~ | ~~(2.1)~~ | ~~14.2~~ | ~~(2.8)~~ | ~~0.54~~ | ~~2.53~~ | ~~25.2~~ | ~~(3.5)~~ | ~~32.7~~ | ~~3.63~~ | ~~259~~ | ~~**river**~~ |
| ~~US SDAR-H1~~ | ~~182~~ | ~~1.41~~ | ~~0.78~~ | ~~(9.5)~~ | ~~17.7~~ | ~~11.1~~ | ~~0.394~~ | ~~4.07~~ | ~~73.2~~ | ~~(13)~~ | ~~(25.4)~~ | ~~2.60~~ | ~~(258)~~ | ~~**metalliferous**~~ |
| ~~US SDAR-L2~~ | ~~150~~ | ~~3.81~~ | ~~1.58~~ | ~~(0.44)~~ | ~~22.0~~ | ~~0.99~~ | ~~0.92~~ | ~~3.34~~ | ~~35.0~~ | ~~(1.72)~~ | ~~54.6~~ | ~~6.10~~ | ~~618~~ | ~~**blended**~~ |

## CRM CONTAMINATED RIVER SEDIMENT

certified analysis listed in mg/kg informational analysis listed in mass %

| Number | As | Cd | Co | Cr | Cu | Hg | Ni | Pb | V | Zn | Al | C.Inorg | C.Org | Ca | Fe | K | Mg | Si | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BAM CC020 | 56.6 | 20.8 | 32.8 | 290 | 560 | 27.4 | 158 | 255 | 53 | 2030 | 5.5 | 0.2 | 9.7 | 2.9 | 5.1 | 1.7 | 0.9 | 25.3 | 18.5 | 52 g |

## CRM TIBET SEDIMENT

analysis listed in mass % T = Total 50 g units

| Number | $SiO_2$ | $Al_2O_3$ | Ba | CaO | F | $Fe_2O_3T$ | $K_2O$ | MgO | Mn | MnO | $Na_2O$ | P | $P_2O_5$ | Sr | Ti | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC70318 | 73.37 | 12.73 | 0.0437 | 1.32 | 0.0456 | 3.19 | 3.56 | 1.07 | 0.0422 | 0.055 | 2.09 | 0.0420 | 0.097 | 0.0165 | 0.253 | 0.422 |
| NCS DC70319 | 71.23 | 13.22 | 0.0470 | 1.40 | 0.0459 | 4.11 | 3.65 | 0.70 | 0.0527 | 0.069 | 2.72 | 0.0484 | 0.111 | 0.0256 | 0.344 | 0.589 |
| NCS DC70320 | 70.36 | 13.95 | 0.0483 | 2.40 | 0.0505 | 3.20 | 3.18 | 0.93 | 0.0451 | 0.059 | 3.26 | 0.0564 | 0.129 | 0.0404 | 0.274 | 0.461 |
| NCS DC70313 | 69.70 | 13.19 | 0.0508 | 0.39 | 0.0622 | 5.85 | 2.56 | 1.58 | 0.0876 | 0.113 | 1.23 | 0.0613 | 0.140 | 0.00593 | 0.439 | 0.725 |
| NCS DC70315 | 66.50 | 10.17 | 0.0384 | 6.50 | 0.0539 | 3.70 | 2.26 | 1.14 | 0.0567 | 0.074 | 1.17 | 0.0501 | 0.115 | 0.0132 | 0.290 | 0.491 |
| NCS DC70323 | 60.95 | 11.89 | 0.0475 | 7.77 | 0.0555 | 5.47 | 2.01 | 0.78 | 0.0608 | 0.078 | 1.09 | 0.0542 | 0.124 | 0.0327 | 0.339 | 0.558 |

contunued analysis listed in mg/kg except * for ng/g and % for mass percent

| Number | Ag | As | Au* | B | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC70318 | 0.06 | 18.0 | 1.4 | 30.6 | 3.32 | 0.49 | 0.9 | 0.10 | 89.6 | 207 | 6.7 | 47.6 | 20.2 | 16.2 | 4.92 | 2.90 | 1.07 | 16.3 | 5.83 |
| NCS DC70319 | 0.21 | 19.6 | 1.2 | 66.2 | 2.31 | 0.80 | 1.4 | 0.19 | 78.1 | 244 | 7.6 | 22.6 | 15.0 | 151 | 3.91 | 2.39 | 0.97 | 15.8 | 4.57 |
| NCS DC70320 | 0.14 | 12.3 | 1.1 | 41.5 | 2.56 | 0.70 | 1.1 | 0.17 | 60 | 152 | 7.3 | 24.4 | 13.0 | 49.0 | 2.94 | 1.64 | 0.96 | 16.9 | 3.74 |
| NCS DC70313 | 0.09 | 22.0 | 1.4 | 77.0 | 2.34 | 0.50 | 1.0 | 0.54 | 74.0 | 63 | 17.9 | 93.8 | 11.9 | 27.1 | 4.73 | 2.81 | 1.21 | 17.8 | 5.40 |
| NCS DC70315 | 0.10 | 22.5 | 1.6 | 59.5 | 2.13 | 0.46 | 1.5 | 0.33 | 71.3 | 96.7 | 9.2 | 37.5 | 7.9 | 16.6 | 4.40 | 2.60 | 1.04 | 14.1 | 5.15 |
| NCS DC70323 | 0.10 | 54.6 | 2.9 | 134 | 3.88 | 0.48 | 1.3 | 0.08 | 90.1 | 71 | 13.2 | 59.0 | 42.5 | 44.0 | 5.56 | 2.98 | 1.40 | 17.1 | 6.58 |

| Number | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pd* | Pr | Pt* | Rb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC70318 | 1.33 | 6.7 | 0.030 | 0.97 | (0.3) | (0.04) | 47.8 | 36.6 | 0.44 | 0.59 | 14.7 | 35.8 | 16.9 | 35.8 | (0.4) | 9.78 | (0.3) | 180 |
| NCS DC70319 | 1.13 | 9.5 | 0.028 | 0.79 | (0.3) | (0.04) | 42.6 | 26.1 | 0.39 | 7.0 | 16.1 | 30.6 | 9.5 | 46.8 | (0.3) | 8.57 | (0.3) | 154 |
| NCS DC70320 | 1.12 | 5.5 | 0.012 | 0.58 | (0.3) | (0.04) | 32.5 | 25.6 | 0.25 | 2.7 | 10.5 | 25.7 | 11.1 | 45.4 | (0.3) | 6.94 | (0.3) | 136 |
| NCS DC70313 | 1.34 | 6.5 | 0.033 | 0.95 | (0.8) | (0.06) | 38.8 | 53.9 | 0.41 | 0.60 | 15.9 | 31.1 | 51.9 | 61.9 | (0.6) | 8.33 | (0.4) | 115 |
| NCS DC70315 | 1.09 | 6.0 | 0.026 | 0.87 | (0.5) | (0.05) | 37.0 | 27.9 | 0.38 | 0.83 | 15.6 | 29.3 | 20.1 | 31.7 | (0.4) | 8.10 | (0.3) | 104 |
| NCS DC70323 | 1.66 | 6.3 | 0.066 | 1.06 | (0.5) | (0.07) | 42.6 | 69.8 | 0.38 | 0.66 | 15.5 | 36.3 | 37.2 | 27.7 | (0.8) | 10.1 | (0.6) | 110 |

| Number | S | Sb | Sc | Se | Sm | Sn | Ta | Tb | Te | Tm | Th | Tl | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC70318 | (48) | 0.84 | 7.3 | 0.05 | 6.62 | 3.8 | 1.8 | 0.91 | (0.03) | 0.46 | 25.1 | 1.0 | 4.8 | 52.5 | 4.1 | 26.5 | 2.83 | 54.1 | 225 |
| NCS DC70319 | (480) | 2.70 | 6.2 | 0.18 | 5.42 | 2.7 | 1.8 | 0.70 | 0.10 | 0.38 | 25.5 | 1.1 | 4.8 | 74.7 | 9.3 | 21.6 | 2.55 | 62.9 | 299 |
| NCS DC70320 | (183) | 1.27 | 6.0 | 0.11 | 4.49 | 2.0 | 1.2 | 0.54 | 0.07 | 0.25 | 16.7 | 0.91 | 3.6 | 59.4 | 4.2 | 15.3 | 1.63 | 61.1 | 184 |
| NCS DC70313 | (123) | 1.91 | 12.0 | 0.16 | 5.99 | 14.9 | 1.2 | 0.83 | 0.05 | 0.43 | 12.1 | 0.64 | 2.6 | 101 | 2.6 | 24.4 | 2.73 | 176 | 222 |
| NCS DC70315 | (177) | 0.82 | 7.9 | 0.12 | 5.61 | 3.3 | 1.3 | 0.78 | (0.03) | 0.40 | 12.3 | 0.62 | 2.5 | 57.4 | 2.4 | 23.7 | 2.55 | 91.1 | 206 |
| NCS DC70323 | (528) | 10.4 | 10.5 | 0.39 | 7.19 | 4.6 | 1.2 | 1.01 | 0.15 | 0.44 | 15.6 | 0.66 | 2.1 | 85.0 | 6.5 | 29.5 | 2.67 | 77.1 | 210 |

## CRM SERPENTINITE

analysis listed in mass % T = total GUW: 50 g units all others: 100 g units

| Number | $Al_2O_3$ | $CO_2$ | CaO | $Cr_2O_3$ | FeO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | Ni | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC21001 | 3.34 | . | 2.97 | . | . | T.Fe:5.47 | . | . | 34.25 | 0.131 | . | . | P:0.012 | 41.37 | 0.180 | 8.86 |
| SARM 47 | 1.09 | . | (0.1) | 0.29 | (0.4) | 4.14 | . | (0.02) | 42.09 | 0.06 | (0.05) | 0.2221 | (0.02) | 36.30 | (0.01) | . |
| GUW SW | 0.66 | 0.28 | 0.18 | . | 2.00 | 7.40 | 13.6 | (0.0014) | 38.5 | 0.084 | 0.013 | 0.22 | (0.0017) | 39.04 | 0.016 | . |
| USZ 24-99 | (0.475) | (0.84) | (0.681) | . | (0.27) | 8.00T | (0.58-) | (0.018) | 38.22 | 0.082 | (0.038) | 0.2300 | (0.023) | 38.54 | (0.022) | 13.33 |

continued analysis listed in mg/kg except % which is mass %

| Number | As | B | Ba | Ce | Co | Cr% | Cs | Cu | F | Ga | $Li_2O$ | Nd | Pb | Rb | S | Sc | Sn | Sr | U | V | W | Y | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC21001 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 0.066% | . | . | . | . | . | . | . | . |
| SARM 47 | . | . | (75) | (20) | 79 | . | . | (5) | . | (5) | . | . | (60) | . | . | . | . | (3) | . | (16) | . | (5) | 45 |
| GUW SW | (5) | 37 | 19 | . | 102 | 0.24 | (5) | 7 | 66 | (4) | (3) | (4) | (6) | (5) | (3) | (5) | (5) | . | (5) | 20 | (5) | . | 58 |
| USZ 24-99 | . | . | . | . | 106 | 0.2780 | . | . | . | . | . | . | . | . | . | . | . | 7.3 | 0.80 | 33.4 | . | . | 39 |

**CRM** **SHALE WITH EXTENSIVE ANALYSIS** analysis listed in mass % * Provisional Analysis

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $Fe_2O_3T$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SO_3$ | $TiO_2$ | $ZrO_2+HfO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03104 | 69.63 | 14.82 | 0.13 | 0.22 | (0.40) | 5.67 | . | (3.71) | 3.76 | 0.67 | 0.024 | 0.20 | 0.043 | 0.028 | 0.68 | . | 4.17 | 60 g |
| NCS DC60106a | 69.34 | 15.03 | 0.12 | 0.19 | 0.37 | 5.65 | . | (3.73) | 3.49 | 0.64 | 0.020 | 0.16 | 0.043 | 0.029 | 0.68 | . | 4.54 | 50 g |
| GUW TS | 62.8 | 15.96 | (0.03) | 0.12 | 0.70 | 7.40 | . | 4.01 | 4.86 | 1.77 | 0.037 | 0.078 | 0.28 | . | 0.69 | . | . | 50 g |
| US SCO-2 * | 61.87 | 13.13 | . | 3.94 | . | . | 4.64 | . | 2.45 | 2.85 | . | 1.02 | 0.181 | 0.565 | . | . | . | 50 g |
| VS 8549-04 | 61.21 | 16.80 | 1.41 | 1.14 | (3.17) | . | 5.57 | . | 3.72 | 2.67 | 0.057 | 0.95 | 0.086 | (1.53) | 0.91 | . | 6.00 | 100 g |
| UL AWI 1 | 60.46 | 16.44 | . | 0.69 | (5.52) | 7.21 | . | . | 3.06 | (2.09) | 0.14 | 0.74 | (0.15) | . | 0.92 | . | 7.75 | 50 g |
| GBW 07107 | 59.23 | 18.82 | (0.10) | 0.60 | 1.39 | . | 7.60 | +5.6 | 4.16 | 2.01 | . | 0.35 | . | . | . | . | (5.95) | 70 g |
| VS 8550-04 | 57.60 | 15.53 | (3.8) | 1.06 | (5.3) | . | 7.47 | . | 2.85 | 3.06 | 0.110 | 1.28 | 0.115 | . | 0.88 | . | (9.5) | 100 g |
| SARM 41 | 56.67 | 13.50 | . | 1.50 | (0.3) | 4.23 | . | . | 1.39 | 8.10 | 0.06 | 0.93 | 0.05 | . | 0.55 | . | . | 100 g |
| US SBC-1 * | 47.64 | 21.0 | . | 2.95 | . | . | 9.71 | . | 3.45 | 2.60 | 0.15 | <0.15 | 0.37 | . | 0.855 | . | 10.2 | 50 g |
| US ShPYR-1 * | 28.7 | 6.14 | . | 14.9 | Fe:1.75 | . | 2.50 | . | 1.53 | 5.23 | . | 1.85 | 0.28 | 0.22 | . | . | . | 200 g |
| US SGR-1b | 28.24 | 6.52 | . | 8.38 | (1.41) | (1.46) | 3.03 | . | 1.66 | 4.44 | . | 2.99 | 0.328 | . | 0.253 | . | . | 30 g |
| US ShBOQ-1 * | 25.13 | 4.00 | . | 32.95 | . | . | 1.61 | . | 0.34 | 0.42 | 0.012 | 0.05 | 0.099 | . | 0.18 | . | 31.6 | 80 g |
| JCRM R651 | 21.74 | 71.7 | . | 0.19 | . | 1.48 | . | . | 0.65 | 0.10 | . | 0.03 | 0.19 | . | 3.15 | 0.18 | 0.58 | 100 g |

continued analysis listed in mg/kg except % which is mass % and ** which is ng/g # US SBC-1 also contains 0.85% inorganic C

| Number | Ag | As | Au | B | Ba% | Be | Bi | C Org% | T.C% | Cd | Ce | Cl% | Co | Cr | Cs | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03104 | . | . | . | . | . | . | . | . | . | . | . | 0.014 | . | . | . | . |
| NCS DC60106a | . | . | . | . | . | . | . | . | . | . | . | 0.011 | . | . | . | . |
| GUW TS | (0.8) | 27.5 | . | 74 | (0.18) | 4 | . | 1.42 | . | . | (168) | . | 41 | 280 | 13 | 460 |
| US SCO-2 * | . | 11.8 | . | . | 0.0580 | 1.75 | . | . | . | . | 54.5 | . | 10.8 | 68.3 | 7.1 | 23.5 |
| VS 8549-04 | 0.10 | 40 | 0.10 | 103 | 0.072 | 2.0 | . | (1.31) | . | (0.27) | 58 | . | 13 | 128 | 4.4 | 34 |
| UL AWI 1 | . | (15) | . | . | 0.0378 | (2.7) | . | . | . | . | 80 | . | 20 | 119 | (7) | 34 |
| GBW 07107 | 0.047 | 1.4 | (1.0**) | 154 | 0.0450 | 3.0 | 0.23 | (0.16) | (0.19) | 0.033 | 109 | 0.0041 | 21 | 99 | 14 | 42 |
| VS 8550-04 | 0.47 | 46 | 2.5 | (118) | 0.0376 | (2.4) | . | (0.93) | . | (0.4) | 53 | . | 20 | 116 | 4.0 | 39 |
| SARM 41 | . | . | . | . | 0.820 | . | . | . | . | . | (60) | . | (15) | 123 | . | 53 |
| US SBC-1 * | . | 25.7 | . | . | 0.0788 | 3.2 | 0.7 | 1.23# | 2.08 | 0.4 | 108 | . | 22.7 | 109 | 8.2 | 31 |
| US ShPYR-1 * | . | 50 | . | . | 0.0538 | . | . | (13.7) | (20.1) | . | 32 | . | . | . | . | 42 |
| US SGR-1b | . | 67 | . | 54 | 0.0290 | . | . | (3.2N) | (28) | (0.9) | 36 | (0.0032) | 12 | 30 | 5.2 | 66 |
| US ShBOQ-1 * | . | (15.1) | . | . | 0.00730 | (1.0) | (0.24) | 4.61 | 11.9 | 2.0 | 24.8 | . | 6.4 | 29.6 | 3.1 | 33.8 |
| JCRM R651 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

N = inorganic C

| Number | Dy | Er | Eu | F | Ga | Gd | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mn | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03104 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC60106a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GUW TS | . | . | (3.2) | 1150 | 21 | . | . | (7) | . | . | . | . | (80) | 40 | (3.6) | . | 130 |
| US SCO-2 * | 3.9 | 2.3 | 1.1 | . | 15.7 | 4.4 | . | . | . | 0.78 | . | . | 28.4 | 38.2 | 0.34 | . | 1.2 |
| VS 8549-04 | 5.6 | (3.3) | 1.2 | (0.12%) | 21 | 6.1 | (2.1) | 4.1 | . | (1.1) | . | . | 30 | 56 | 0.44 | . | 1.7 |
| UL AWI 1 | 5.1 | 2.9 | 1.47 | . | 22 | 6 | . | 6.3 | . | 1.1 | . | . | 38 | . | 0.45 | . | . |
| GBW 07107 | 5.1 | 2.7 | 1.7 | 1290 | 26 | 6.7 | 3.1 | 2.9 | 0.010 | 0.98 | 0.24 | 0.082 | 62 | 44 | 0.41 | 173 | 0.35 |
| VS 8550-04 | (4.4) | (2.4) | 1.2 | . | 18 | 4.5 | (2.1) | 4.7 | . | (0.92) | . | . | 28 | 50 | 0.40 | . | (0.95) |
| SARM 41 | . | . | . | . | (20) | . | . | . | . | . | . | . | . | . | . | . | (5) |
| US SBC-1 * | 7.1 | 3.8 | 1.98 | . | 27 | 8.5 | . | 3.7 | . | 1.4 | . | . | 52.5 | 163 | 0.54 | . | 2.4 |
| US ShPYR-1 * | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 294 | 23 |
| US SGR-1b | (1.9) | 1.1 | 0.56 | 1960 | (12) | (2) | . | 1.4 | (0.3) | (0.4) | . | . | 20 | 147 | . | 267 | 35 |
| US ShBOQ-1 * | 1.67 | 0.97 | 0.45 | . | 6.27 | 1.95 | . | (1.18) | . | 0.34 | . | . | 13.5 | 24.1 | 0.15 | . | 47.8 |
| JCRM R651 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

| Number | N | Nb | Nd | Ni | P | Pb | Pd | Pr | Pt | Rb | Rh | S% | Sb | Sc | Se | Sm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03104 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC60106a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GUW TS | . | (13) | (108) | 170 | . | 33 | . | . | . | 230 | . | 0.022 | (8.2) | 22 | . | (22.9) |
| US SCO-2 * | . | 11.2 | 25 | 27.8 | . | 20 | . | 6.6 | . | 101 | . | . | 0.9 | 11.4 | . | 4.9 |
| VS 8549-04 | . | 11 | 28 | 39 | . | 8.2 | (0.0013) | (6.5) | (0.0012) | 0.014% | . | 0.62 | . | 23 | . | 5.7 |
| UL AWI 1 | . | 17 | 37 | 61 | . | (24) | . | 9.3 | . | 130 | . | . | . | 16 | . | 7 |
| GBW 07107 | 540 | 14.3 | 48 | 37 | 690 | 8.7 | . | 13.6 | . | 205 | . | (0.0066) | 0.18 | 18.5 | 0.075 | 8.4 |
| VS 8550-04 | . | 12 | 25 | 50 | . | 14.9 | (0.0023) | 6.2 | (0.0022) | 112 | (0.001) | 1.02 | (1) | 20 | . | 5.4 |
| SARM 41 | . | (8) | . | 122 | . | (30) | . | . | . | 59 | . | (0.15) | . | . | . | . |
| US SBC-1 * | . | 15.3 | 49.2 | 82.8 | . | 35 | . | 12.6 | . | 147 | . | 0.715 | 1.01 | 20 | . | 9.6 |
| US ShPYR-1 * | . | . | . | 19 | 1200 | 24 | . | . | . | 64 | . | . | . | . | . | . |
| US SGR-1b | . | (5.2) | 16 | (29) | . | 38 | . | . | . | . | . | 1.53 T | 3.4 | 4.6 | (3.5) | 2.7 |
| US ShBOQ-1 * | . | (5.6) | 11 | 74.9 | . | (6.1) | . | 2.94 | . | 16.9 | . | 1.64 | 3.28 | (3.6) | . | 2.1 |
| JCRM R651 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

| Number | Sn | Sr | Ta | Tb | Te | Th | Ti | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03104 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC60106a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GUW TS | (4.1) | 88 | (0.97) | (2.4) | . | (9.1) | . | . | . | (22) | 960 | . | 150 | (15) | 63 | 290 |
| US SCO-2 * | . | 195 | 0.82 | 0.68 | . | 9 | . | . | 0.34 | 3.2 | 117 | . | 23.1 | 2.2 | 97 | . |
| VS 8549-04 | 2.2 | 150 | 0.86 | 0.95 | . | 8.2 | . | . | (0.5) | 2.1 | 148 | (3.5) | 28 | 2.9 | 96 | 176 |
| UL AWI 1 | . | 108 | 1.2 | 0.94 | . | 12 | . | . | 0.42 | 3 | 134 | . | 29 | 3 | 99 | 223 |
| GBW 07107 | 2.0 | 90 | 0.9 | 1.02 | (0.023) | 12.8 | 3950 | 0.71 | 0.43 | 1.5 | 87 | 0.79 | 26 | 2.6 | 55 | 96 |
| VS 8550-04 | (3.2) | 142 | (0.7) | (0.74) | . | 7.1 | . | . | (0.33) | 1.65 | 122 | (3.3) | 26 | 2.7 | 97 | 176 |
| SARM 41 | . | 54 | . | . | . | (12) | . | . | . | . | 139 | . | 17 | . | 76 | 146 |
| US SBC-1 * | 3.3 | 178 | 1.1 | 1.2 | . | 15.8 | . | 0.89 | 0.56 | 5.76 | 220 | 1.6 | 36.5 | 3.64 | 186 | 134 |
| US ShPYR-1 * | . | 753 | . | . | . | 5 | 1300 | . | . | 4 | 92 | . | . | . | 62 | . |
| US SGR-1b | (1.9) | 420 | . | . | . | 4.8 | . | . | (0.18) | 5.4 | 130 | 2.6 | (13) | (0.94) | 74 | (53) |
| US ShBOQ-1 * | (3.8) | 1078 | . | 0.29 | . | 2.74 | . | (2.7) | 0.15 | (9) | 419 | . | 9.6 | 0.98 | 97.8 | 52.6 |
| JCRM R651 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

last

Sample US ShPYR-1 also shows much more information on the certificate, such as oil yiled, particle size, programmed prolysis and minerology.

## SILLIMANITE

# = class, where 1 = CRM and 2 = RM

| # | Number | $Al_2O_3$ | $SiO_2$ | CaO | $Fe_2O_3$ | $K_2O$ | $Li_2O$ | MgO | MnO | $Na_2O$ | $TiO_2$ | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | CERAM 2CAS12 | 63.8 | 33.9 | 0.25 | 0.31 | 0.13 | . | 0.12 | . | 0.15 | 1.31 | 0.13 | 25 or 100 g |
| 1 | BCS 309 | 61.1 | 34.1 | 0.22 | 1.51 | 0.46 | (0.01) | 0.17 | (0.03) | 0.34 | 1.92 | . | 100 g |

## CRM SILLIMANITE SCHIST

analysis listed in mass % 100 g units

| Number | $Al_2O_3$ | CaO | $Fe_2O_3$ | FeO | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 44 | 58.80 | 0.14 | 2.06 | (1.0) | (0.18) | (0.1) | (0.03) | (0.05) | (0.10) | 34.84 | 1.83 |

continued analysis listed in mg/kg

| Number | Ba | Ce | Co | Cr | Cu | Ga | Mo | Nb | Ni | Pb | Rb | Sr | Th | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SARM 44 | (50) | (220) | (8) | 384 | (10) | (55) | (15) | 96 | (15) | (30) | 13 | 5 | 50 | 395 | 84 | 271 | 406 |

## CRM SILICA ROCK

analysis listed in mass % 50 g

| Number | $SiO_2$ | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC28016 | 99.42 | 0.250 | 0.045 | 0.050 | 0.077 | 0.0083 | 0.00074 | 0.055 | 0.0015 | 0.0073 |
| NCS DC28019 | 94.92 | 2.42 | 0.043 | 0.37 | 1.41 | 0.042 | 0.0050 | 0.32 | 0.0045 | 0.0083 |

## CRM SILICEOUS MINERAL SETS

available in SETS/3, as grouped 50 g units

| Number | Material | $SiO_2$ | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCRM R702 | **Albite** | 67.69 | 19.64 | 0.546 | 0.058 | 0.137 | 0.103 | 0.004 | 11.31 | 0.139 | . | 0.030 | 0.23 |
| JCRM R703 | **Potassium Feldspar** | 66.99 | 17.93 | 0.095 | 0.082 | 11.02 | 0.040 | 0.003 | 3.32 | 0.008 | . | 0.005 | 0.36 |
| JCRM R803 | **Prophylite** | 68.52 | 23.95 | 0.033 | 0.047 | 2.32 | 0.017 | 0.0014 | 0.165 | 0.018 | 0.02 | 0.104 | 4.40 |
| JCRM R604 | **Gairome Clay** | 47.88 | 35.37 | 0.216 | 1.357 | 0.468 | 0.251 | 0.006 | 0.083 | 0.020 | (0.014) | 0.865 | 13.37 |
| JCRM R605 | **Kaolin** | 49.77 | 35.64 | 0.004 | 0.283 | (0.008) | 0.004 | . | 0.032 | 0.105 | (0.023) | 0.068 | 13.90 |
| JCRM R751 | **Pottery Stone** | 79.32 | 14.15 | 0.033 | 0.340 | (3.00) | 0.049 | 0.003 | 0.121 | 0.009 | (0.0010) | 0.010 | 2.73 |

Also see our Industrial Materials catalog for more Siliceous Materials
http://www.brammerstandard.com/pdf/industrial.pdf

## CRM SILT

analysis listed in mass %

| Number | $SiO_2$ | $Al_2O_3$ | $Co_2$ | CaO | FeO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | L.O.I. | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 5366-90 | 60.9 | 14.35 | 2.4 | 2.95 | 1.9 | 5.44 | 3.58 | 2.54 | 0.088 | 2.33 | 0.18 | 0.08 | 0.62 | 6.5 | 50 g |
| VS 3133-85 | 60.85 | 14.40 | . | 2.95 | . | 5.45 | 3.56 | 2.54 | 0.087 | 2.33 | 0.18 | (0.10) | 0.62 | 6.39 | 100 g |
| VS 3132-85 | 60.54 | 16.46 | . | 0.41 | . | 8.76 | 2.43 | 1.60 | 0.13 | 1.61 | 0.19 | (0.027) | 0.98 | 6.78 | 100 g |
| VS 3131-85 | 47.0 | 9.48 | . | 7.76 | . | 5.92 | 2.26 | 6.06 | 0.30 | 0.53 | 0.13 | (0.037) | 0.50 | 20.10 | 100 g |
| VS 5367-90 | 46.7 | 9.45 | 9.8 | 7.74 | 1.1 | 5.88 | 2.24 | 6.0 | 0.30 | 0.53 | 0.13 | 0.03 | 0.50 | 20.0 | 50 g |

continued analysis listed mass %

| Number | As | B | Ba | Ce | Cr | Cu | Li | Ni | Rb | Sb | Sr | V | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 5366-90 | 0.04 | 0.007 | 0.09 | 0.007 | 0.008 | 0.019 | 0.0035 | 0.0036 | 0.011 | 0.013 | 0.027 | 0.011 | 0.0094 | 0.023 |
| VS 3133-85 | (0.043) | 0.006 | 0.091 | 0.008 | 0.0088 | 0.019 | 0.0037 | 0.0036 | 0.012 | (0.0015) | 0.028 | 0.011 | 0.009 | 0.023 |
| VS 3132-85 | (0.0038) | 0.007 | 0.057 | (0.006) | 0.014 | 0.0048 | 0.00716 | 0.0072 | 0.0077 | (0.00019) | 0.013 | 0.018 | 0.012 | 0.022 |
| VS 3131-85 | (0.0016) | 0.007 | 0.062 | (0.006) | 0.0068 | 0.0037 | 0.0096 | 0.0040 | 0.0061 | . | 0.025 | 0.011 | 0.005 | 0.013 |
| VS 5367-90 | . | 0.008 | 0.059 | 0.005 | 0.0062 | 0.0037 | 0.009 | 0.0040 | 0.0062 | . | 0.025 | 0.0097 | 0.0049 | 0.013 |

continued analysis listed in mg/kg

| Number | Ag | Be | Cd | Co | Cs | Ga | Ge | La | Mo | Nb | Nd | Pb | Sc | Sm | Sn | W | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 5366-90 | . | 4 | . | 13 | 5 | 18 | . | 55 | 6.5 | 11 | 30 | 55 | 12 | 5 | 5 | 12 | 25 | 2.9 |
| VS 3133-85 | (0.8) | 3.7 | (1.5) | 13 | 5.8 | 16 | 1.4 | 61 | 10 | 17 | . | 58 | 17 | . | 5 | . | 26 | 3.3 |
| VS 3132-85 | (0.17) | 2.8 | (0.2) | 30 | 4.1 | 16 | 1.6 | 43 | 2.5 | 13 | . | 23 | 20 | . | 3.9 | . | 30 | 4.3 |
| VS 3131-85 | (0.2) | 2.4 | (2.3) | 21 | 4 | 11 | (1.2) | (38) | 2.4 | 11 | . | 20 | 11 | . | 5 | . | 22 | (2.8) |
| VS 5367-90 | . | 2.1 | . | 21 | 3.2 | 11 | . | 35 | 2.1 | 9 | 15 | 17 | 10 | 3 | 3.6 | . | 21 | 3 |

## CRM SILVER ORE

analysis listed in mass % except * which is mg/kg USZ: 250g KZ: 100g SRM: 200g

| Number | Ag* | Ba | Cu | Fe | $Fe_2O_3$ | Pb | S | SO3 | Zn | $Al_2O_3$ | As | Bi | $CO_2$ | CaO | Cd | Co* | F | Ge* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 9-92 | 740 | . | 2.25 | . | . | 0.041 | . | . | 0.20 | . | . | . | . | . | . | . | . | . |
| USZ 17-94 | 347.92 | . | 0.44 | . | 7.425 | 10.00 | . | 21.25 | 8.72 | 5.82 | . | . | . | 3.87 | . | . | . | . |
| USZ 8-91 | 331 | . | 0.83 | . | 48.40 | 0.13 | . | 6.85 | 0.59 | 2.11 | 0.53 | 0.11 | . | 0.25 | 0.0020 | . | . | . |
| USZ 7-91 | 169 | . | 0.46 | . | . | 0.101 | . | . | 0.42 | . | . | . | . | . | 0.0015 | . | . | . |
| KZ 6587-93 | 60.2 | 33.6 | 0.019 | 2.5 | . | 2.86 | 11.5 | . | 2.72 | . | 0.016 | . | . | . | 0.012 | . | . | . |
| ~~KZ 3031-84~~ | ~~37.4~~ | ~~.~~ | ~~3.37~~ | ~~15.17T~~ | ~~.~~ | ~~.~~ | ~~2.78~~ | ~~.~~ | ~~.~~ | ~~4.93~~ | ~~.~~ | ~~.~~ | ~~2.87~~ | ~~28.05~~ | ~~.~~ | ~~.~~ | ~~0.056~~ | ~~.~~ |
| KZ 6586-93 | 19 | 0.38 | 0.013 | 2.03 | . | 3.5 | 0.55 | . | 0.045 | . | . | . | . | . | . | . | . | . |
| KZ 6588-93 | 13.7 | 0.42 | . | 3.67 | . | 1.57 | 5.88 | . | 4.68 | . | . | . | . | . | 0.013 | . | . | 4.4 |
| KZ 47-85 | 8.7 | . | 0.42 | 21.0 | . | . | 2.70 | . | . | . | . | . | . | . | . | . | . | . |
| ~~KZ 3030-84~~ | ~~8.6~~ | ~~.~~ | ~~.~~ | ~~13.84T~~ | ~~.~~ | ~~.~~ | ~~2.04~~ | ~~.~~ | ~~.~~ | ~~10.85~~ | ~~.~~ | ~~.~~ | ~~1.04~~ | ~~18.94~~ | ~~.~~ | ~~.~~ | ~~0.048~~ | ~~.~~ |
| KZ 8079-94 | 3.7 | . | 0.73 | . | . | 0.62 | 1.25 | . | 0.41 | . | . | . | . | . | 0.016 | . | . | . |
| KZ 3029-84 | 2.1 | . | 0.30 | 3.11T | . | . | 1.59 | . | . | 15.18 | . | . | . | . | . | . | 0.074 | . |
| KZ 8078-94 | 1.6 | . | 0.38 | . | . | 0.21 | 0.75 | . | 0.15 | . | . | . | . | . | 0.0036 | . | . | . |

continued

| Number | $K_2O$ | MgO | MnO | Mo | $Na_2O$ | Ni | $P_2O_5$ | Re* | Sb | Se* | $SiO_2$ | Sr | Te* | $TiO_2$ | Zr | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 9-92 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| USZ 17-94 | 1.56 | 0.45 | (2.39) | . | (0.13) | . | 0.12 | . | . | . | 42.08 | . | . | 0.30 | . | |
| USZ 8-91 | 0.53 | 1.48 | 2.77 | . | . | . | 0.54 | . | 0.50 | . | 17.80 | . | . | 0.12 | . | |
| USZ 7-91 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| KZ 6587-93 | . | . | . | . | . | . | . | . | 0.013 | . | . | 0.69 | . | . | . | |
| ~~KZ 3031-84~~ | ~~0.26~~ | ~~1.33~~ | ~~0.33~~ | ~~0.18~~ | ~~0.18~~ | ~~.~~ | ~~.~~ | ~~0.40~~ | ~~.~~ | ~~13.1~~ | ~~33.56~~ | ~~.~~ | ~~9.1~~ | ~~0.19~~ | ~~.~~ | |
| KZ 6586-93 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 0.019 | |
| KZ 6588-93 | . | . | . | . | . | . | . | . | 0.0066 | . | . | 0.029 | . | . | . | |
| KZ 47-85 | . | . | . | 0.012 | . | . | . | . | . | . | . | . | . | . | . | |
| ~~KZ 3030-84~~ | ~~0.48~~ | ~~2.06~~ | ~~0.41~~ | ~~0.38~~ | ~~0.16~~ | ~~.~~ | ~~0.17~~ | ~~0.30~~ | ~~.~~ | ~~.~~ | ~~42.32~~ | ~~.~~ | ~~.~~ | ~~0.54~~ | ~~.~~ | |
| KZ 8079-94 | . | . | . | . | . | . | . | 0.29 | . | . | . | . | . | . | . | last |
| KZ 3029-84 | 4.06 | . | 0.081 | 0.0086 | 1.95 | . | 0.094 | 0.043 | . | . | 68.09 | . | . | 0.42 | . | last |
| KZ 8078-94 | . | . | . | . | . | . | . | 0.072 | . | . | . | . | . | . | . | last |

## SLATE WITH EXTENSIVE ANALYSIS

# = class, where 1 = CRM and 2 = RM analysis listed in mass %

| # | Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GUW TB2 | 60.4 | 20.5 | . | 0.20 | 5.4 | 6.95T | 3.6+ | 0.86 | 1.86 | 0.047 | 1.29 | 0.095 | . | 0.93 | 3.46 |
| 1 | GUW TB | 60.23 | 20.64 | 0.14 | . | 5.43 | 6.90 | 3.78+ | 3.87 | (1.93) | (0.052) | 1.32 | 0.097 | . | 0.93 | . |
| 1 | JSl-1 | 59.47 | 17.60 | (0.769) | 1.479 | 4.523 | 1.875 | +3.92 -0.654 | 2.845 | 2.413 | 0.0599 | 2.184 | 0.202 | . | 0.725 | . |
| 1 | JSl-2 | 59.45 | 18.17 | (1.236) | 1.885 | 5.048 | 0.959 | +4.158 -0.362 | 3.008 | 2.385 | 0.0818 | 1.344 | 0.164 | 0.1467 | 0.754 | . |
| 2 | IAG OU-6 | 57.35 | 20.45 | (0.23) | 0.74 | (1.65) | 8.94T | (0.14-) | 3.03 | 2.41 | 0.28 | 1.76 | 0.12 | . | 0.99 | 3.62 |

continued analysis listed in mg/kg

| Number | As | Ba | Be | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Ga | Gd | Hf | Ho | La | Li | Lu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW TB2 | . | 649 | . | . | 14 | 92 | 11 | 49 | . | . | . | . | . | . | . | . | . | 109 | . |
| GUW TB | 10.5 | 780 | 4.1 | 104 | 14 | 82 | 9 | 49 | 1.8 | . | . | 740 | 25 | . | 5 | . | 61 | 111 | 0.45 |
| JSl-1 | 14.9 | 305 | 2.28 | 60.6 | 15.5 | 60.9 | 7.60 | 40.8 | (5.11) | . | 1.22 | 598 | . | . | 4.63 | 0.688 | 29.3 | (50.7) | 0.442 |
| JSl-2 | 11.4 | 302 | 2.68 | 69.6 | 15.7 | 64.7 | 8.24 | 44.5 | 4.71 | . | 1.14 | 678 | . | . | 5.54 | (0.671) | 32.7 | 52.6 | 0.404 |
| IAG OU-6 | 13.23 | 480 | (2.53) | 77.1 | 29.2 | 70.7 | 8.10 | 40.4 | 5.06 | 2.93 | 1.36 | . | 24.17 | 5.30 | 4.70 | 1.04 | 33.2 | (95.3) | 0.45 |

| Number | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Th | Tl | Tm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GUW TB2 | . | . | 39 | . | . | 185 | . | . | . | 5 | 159 | . | . | . | . | . |
| GUW TB | . | 50 | 40 | 8 | . | 180 | 3.4 | 16 | 8.4 | 6 | 160 | 1.4 | . | 18 | . | . |
| JSl-1 | 9.53 | 28.8 | 37.6 | 17.4 | 6.07 | 117 | . | 16.7 | 6.02 | . | 193 | 0.842 | 0.717 | 9.97 | . | . |
| JSl-2 | 12.3 | 32.0 | 40.6 | 19.7 | (6.44) | 118 | . | 16.8 | 5.95 | . | 230 | 1.04 | 0.727 | 11.5 | . | . |
| IAG OU-6 | 14.49 | 30.2 | 40.2 | 28.80 | 7.91 | 121.3 | (0.56) | 23.1 | 6.01 | 2.67 | 131.7 | 1.02 | 0.86 | 11.3 | (0.54) | (0.45) |

| Number | U | V | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|
| GUW TB2 | . | 96 | . | 3.8 | 94 | 180 | 50 g |
| GUW TB | . | 107 | 39 | 3.3 | 94 | 180 | 50 g |
| JSl-1 | 2.63 | 131 | 30.0 | 2.81 | 108 | 174 | 100 g |
| JSl-2 | 2.92 | 122 | 31.3 | 3.15 | 101 | 191 | 100 g |
| IAG OU-6 | 1.92 | 129.8 | 27.75 | 2.98 | 111.4 | 174.2 | ~35 g |

B: 0.0090% W: 0.00022%

## CRM SOIL - AQUA REGIA METHOD

certified analysis listed in mg/kg

| Number | As | Cd | Co | Cr | Cu | Hg | Mn | Ni | Pb | Zn | Units | Method Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BAM U110 * | 13.0 | 7.0 | 14.5 | 190 | 262 | 49.3 | 580 | 95.6 | 185 | 990 | 60 g | ISO 11466 |

informational analysis listed in mass %

| Number | Si | Al | Ca | Fe | K | S | Mg | Dry Matter | LOI | Org.C | Inorg.C | Tot.C | H | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BAM U110 * | 25.7 | 5.1 | 4.1 | 2.8 | 1.9 | 1.1 | 1.0 | 97.3 @ 105'C | 13.3 @ 550'C | 6.7 | 0.8 | 7.5 | 1.2 | 0.4 |

* BAM U110 spectroscopic analysis also certified, see "Soil - Contaminated"

## CRM MERCURY IN SOIL

analysis listed in mass % except * which is mg/kg

| Number | Hg* | $Al_2O_3$ | C | CaO | $Fe_2O_3T$ | $K_2O$ | MgO | MnO | N | $Na_2O$ | S | $SiO_2$ | $TiO_2$ | Dry Mass | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 305 | 2.75 | (13.38) | (1.31) | (4.02) | (4.95) | (2.88) | (2.10) | (0.104) | (0.085) | (1.63) | (0.071) | (61.89) | (0.659) | (98.90%) | 30 or 50 g |
| USZ 304 | 1.52 | (11.96) | (1.42) | (4.55) | (4.22) | (2.85) | (1.79) | (0.082) | (0.075) | (1.99) | (0.093) | (64.11) | (0.605) | (99.21%) | 30 or 50 g |
| USZ 303 | 0.157 | (13.10) | (1.19) | (3.39) | (4.68) | (2.98) | (1.68) | (0.097) | (0.088) | (1.84) | (0.021) | (64.39) | (0.65) | (99.05%) | 30 or 50 g |

## CRM AGRICULTRURAL SOIL

analysis listed in mass % except * which is mg/kg — 50 g units

| Number | C | C.Org | $Al_2O_3$ | $T.Fe_2O_3$ | Ti | $K_2O$ | MgO | CaO | N | $Na_2O$ | P | S | $SiO_2$ | Mn | Ag* | As* | B* | Ba* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71020 | 3.85 | 2.10 | 14.34 | 12.09 | 1.78 | 1.61 | 0.906 | 0.541 | 0.268 | 0.187 | 0.141 | 0.117 | 53.61 | 0.0560 | 0.093 | 14.9 | 63 | 184 |
| NCS ZC71021 | 2.02 | 1.12 | 14.26 | 6.59 | 0.570 | 3.25 | 1.12 | 0.377 | 0.211 | 0.168 | 0.106 | 0.0437 | 63.8 | 0.120 | 0.155 | 83 | 106 | 531 |
| NCS ZC71022 | 1.37 | 0.710 | 17.68 | 9.77 | 0.618 | 2.25 | 1.09 | 0.483 | 0.158 | 0.146 | 0.0704 | 0.0327 | 55.9 | 0.675 | 0.16 | 55.7 | 77 | 471 |
| NCS ZC71023 | 0.66 | 0.368 | 14.08 | 4.81 | 0.372 | 2.57 | 1.54 | 2.15 | 0.623* | 3.216 | 0.0811 | 0.0160 | 66.9 | 0.0594 | 0.094 | 4.45 | 23.3 | 733 |
| NCS ZC71024 | 1.60 | 0.84 | 13.26 | 4.42 | 0.431 | 2.66 | 1.29 | 1.67 | 0.129 | 1.99 | 0.0613 | 0.0677 | 66.9 | 0.0820 | 1.07 | 30.0 | 44.6 | 783 |
| NCS ZC71025 | 1.81 | 0.995 | 14.15 | 5.37 | 0.435 | 2.45 | 1.76 | 1.98 | 0.170 | 2.47 | 0.152 | 0.0379 | 63.1 | 0.0848 | 0.399 | 9.88 | 34.9 | 765 |

continued analysis in mg/kg

| Number | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cu | Dy | Er | Eu | F | F.Sol | Ga | Gd | Ge | Hg | Ho |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71020 | 3.40 | 0.483 | 4.6 | 0.57 | 116 | 51 | 32.8 | 152 | 98 | 8.8 | 4.6 | 2.80 | 878 | 2.29 | 23.1 | 9.7 | 1.59 | 0.249 | 1.72 |
| NCS ZC71021 | 2.57 | 0.611 | 4.2 | 1.47 | 98 | 52 | 19.9 | 86.1 | 32.6 | 5.4 | 3.22 | 1.25 | 960 | 2.3 | 19.3 | 5.4 | 1.62 | 12.2 | 1.13 |
| NCS ZC71022 | 3.83 | 0.85 | 4.0 | 12.1 | 107 | 42 | 23.9 | 106 | 52.2 | 7.6 | 4.23 | 1.87 | 883 | 1.91 | 25.8 | 8.0 | 1.89 | 0.395 | 1.53 |
| NCS ZC71023 | 1.78 | 0.173 | 2.86 | 0.130 | 59.3 | 104 | 13.8 | 82.8 | 25.2 | 3.48 | 1.97 | 1.24 | 485 | 6.1 | 16.9 | 4.11 | 1.21 | 0.029 | 0.692 |
| NCS ZC71024 | 2.11 | 2.38 | 9.0 | 26.2 | 77.8 | 410 | 13.4 | 61 | 63.1 | 4.42 | 2.57 | 1.32 | 503 | 10.9 | 16.6 | 5.11 | 1.54 | 4.64 | 0.88 |
| NCS ZC71025 | 2.09 | 1.06 | 5.5 | 1.99 | 71.7 | 140 | 16.3 | 95.2 | 54.2 | 4.33 | 2.44 | 1.4 | 521 | 6.2 | 18.0 | 5.01 | 1.27 | 0.309 | 0.86 |

| Number | I | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se | Sm | Sn | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71020 | 1.85 | 60 | 56 | 0.61 | 3.62 | 52 | 57 | 77.7 | 26.3 | 14.3 | 55 | 1.36 | 22.2 | 1.42 | 11.1 | 3.60 | 96 |
| NCS ZC71021 | 1.96 | 45 | 52.1 | 0.51 | 2.37 | 19.7 | 34.8 | 38.1 | 248 | 9.5 | 131 | 6.3 | 13.4 | 0.659 | 6.4 | 3.94 | 80.3 |
| NCS ZC71022 | 4.85 | 55.6 | 67 | 0.64 | 2.87 | 21.3 | 48 | 56.1 | 215 | 12.8 | 147 | 2.2 | 17.8 | 0.598 | 9.3 | 4.62 | 42.2 |
| NCS ZC71023 | 1.63 | 31.1 | 21.8 | 0.305 | 0.69 | 11.8 | 27.8 | 29.9 | 19.7 | 7.33 | 87.1 | 0.41 | 10.8 | 0.143 | 5.06 | 2.22 | 343 |
| NCS ZC71024 | 2.54 | 41.5 | 35.1 | 0.404 | 14.1 | 14.3 | 34.3 | 26.8 | 182 | 9.66 | 99 | 2.87 | 9.8 | 0.75 | 6.06 | 4.53 | 196 |
| NCS ZC71025 | 2.59 | 38.2 | 31.9 | 0.364 | 1.35 | 13.8 | 33.4 | 38.3 | 53.9 | 8.85 | 97.7 | 1.95 | 11.9 | 0.451 | 6.03 | 5.22 | 267 |

| Number | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71020 | 1.58 | 11.5 | 0.43 | 0.68 | 6.1 | 289 | 1.51 | 45.2 | 4.2 | 185 | 369 |
| NCS ZC71021 | 0.92 | 18.5 | 1.42 | 0.51 | 4.74 | 112 | 2.37 | 29.3 | 3.26 | 201 | 278 |
| NCS ZC71022 | 1.31 | 19.7 | 1.15 | 0.66 | 5.91 | 175 | 2.87 | 40.8 | 4.2 | 941 | 277 |
| NCS ZC71023 | 0.632 | 8.0 | 0.528 | 0.306 | 1.49 | 81.4 | 1.02 | 18.0 | 1.93 | 62.7 | 278 |
| NCS ZC71024 | 0.79 | 11.4 | 0.865 | 0.395 | 2.26 | 79 | 3.28 | 23.3 | 2.54 | 100 | 335 |
| NCS ZC71025 | 0.781 | 9.8 | 0.625 | 0.367 | 2.06 | 91 | 2.06 | 22.7 | 2.36 | 159 | 219 |

## CRM SOIL

analysis listed in mass % 100 g units

| Number | $Al_2O_3$ | CaO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSo-1 | 17.99 | 2.56 | 11.49 | 0.34 | 2.11 | 0.202 | 0.66 | 0.48 | . | 38.28 | 1.23 | . |
| USZ 15-94 | 14.66 | 2.49 | 5.65 | 2.49 | 1.52 | 0.103 | 3.06 | 0.154 | (0.03) | 63.28 | 0.87 | (5.22) |
| USZ 16-94 | 14.41 | 2.49 | 4.99 | 2.60 | 1.45 | 0.109 | 3.10 | 0.16 | (0.02) | 64.37 | 0.86 | (4.81) |

continued analysis listed in mg/kg

| Number | As | B | Ba | Be | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Hg | Ho | In |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSo-1 | . | (12) | (269) | . | . | . | . | (32) | (71) | (1.5) | (169) | . | . | . | . | . | . | . | . |
| USZ 15-94 | 9.46 | . | 657 | 2.17 | (0.32) | (0.13) | 67.84 | 14.01 | 68.88 | (3.74) | 29.40 | (4.43) | (2.61) | (1.43) | (17.92) | (5.54) | (0.02) | (0.96) | (0.07) |
| USZ 16-94 | 6.51 | . | 658 | 2.44 | (0.27) | (0.14) | 71.79 | (12.88) | 357.36 | (3.86) | 20.51 | (4.86) | (2.88) | (1.45) | (17.47) | (5.94) | (0.03) | (1.02) | (0.06) |

| Number | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Th |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSo-1 | . | (11.2) | . | . | . | . | (39) | (13) | . | (14.5) | . | . | . | . | (196) | . | . | . |
| USZ 15-94 | (33.9) | (23.09) | (0.31) | 1.11 | (12.21) | (32.46) | 31.55 | 17.26 | (8.5) | 80.49 | (1.09) | 11.18 | (6.08) | (2.55) | 387 | (1.19) | (0.75) | 8.69 |
| USZ 16-94 | (35.12) | 22.59 | (0.37) | 1.03 | 13.31 | (34.61) | 43.09 | 17.88 | (9.1) | 84.38 | (0.78) | 11.33 | (6.97) | (2.66) | 387 | (1.17) | (0.78) | 9.71 |

| Number | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|
| JSo-1 | . | . | . | (300) | . | (24.9) | . | (105) | (96) |
| USZ 15-94 | (0.42) | (0.32) | 1.84 | 97 | (1.36) | 22.15 | (2.58) | 74.67 | (298) |
| USZ 16-94 | (0.47) | (0.35) | 2.25 | 87.30 | (1.53) | 24.43 | (2.84) | 72.83 | (388) |

## CRM SOIL SET

available in SET/6 ONLY analysis listed in mg/kg% 25 g units

| Number | As | Cd | Cr | Hg | Pb | Se |
|---|---|---|---|---|---|---|
| JSAC 0466 | 1093 | 1199 | 1483 | 113.5 | 1214 | 1175 |
| JSAC 0465 | 550 | 607.4 | 738 | 57.8 | 612.4 | 587 |
| JSAC 0464 | 271.1 | 301.0 | 499 | 28.6 | 302.7 | 291.9 |
| JSAC 0463 | 137.6 | 146.8 | 244 | 14.76 | 151.6 | 141.5 |
| JSAC 0462 | 71.5 | 74.2 | 149.6 | 7.27 | 73.7 | 71.6 |
| JSAC 0461 | 21.53 | (0.30) | 97.2 | 0.075 | 24.4 | (0.44) |

## CRM SOIL (TILL) REFERENCE MATERIALS WITH ACID EXTRACTION

analysis listed in mass % 100 g units

| Number | $SiO_2$ | $Al_2O_3$ | CaO | Fe | $Fe_2O_3$ | $K_2O$ | MgO | Mn | MnO | $Na_2O$ | P | $P_2O_5$ | S | Ti | $TiO_2$ | LOI 1000'C | LOI 500'C | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN TILL-3 | 69.1 | 12.2 | 2.63 | 2.78 | 3.92 | 2.42 | 1.71 | 0.0520 | 0.06 | 2.64 | 0.0490 | 0.11 | <0.05 | 0.2910 | 0.49 | 4.6 | 3.6 | 99.88 |
| ~~CAN TILL-1~~ | ~~60.9~~ | ~~13.7~~ | ~~2.72~~ | ~~4.81~~ | ~~6.82~~ | ~~2.22~~ | ~~2.15~~ | ~~0.1420~~ | ~~0.18~~ | ~~2.71~~ | ~~0.0930~~ | ~~0.22~~ | ~~<0.05~~ | ~~0.5990~~ | ~~0.98~~ | ~~7.3~~ | ~~6.3~~ | ~~99.90~~ |
| CAN TILL-2 | 60.8 | 16.0 | 1.27 | 3.84 | 5.39 | 3.07 | 1.83 | 0.0780 | 0.10 | 2.19 | 0.0750 | 0.17 | <0.05 | 0.5300 | 0.88 | 8.1 | 6.8 | 99.80 |

continued analysis in mg/kg except % for mass percent and * for parts per billion

| Number | As | Au* | Ba | Be | Bi | Br | Ce | Co | Cr | Cs | Cu | Eu | Er | Hf | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Rb | Sb | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN TILL-3 | 87 | 6 | 489 | 2.0 | <5 | 4.5 | 42 | 15 | 123 | 1.7 | 22 | <1.0 | 1.4 | 8 | 21 | 21 | 0.2 | 2 | 7 | 16 | 39 | 26 | 55 | 0.9 | 10 |
| ~~CAN TILL-1~~ | ~~18~~ | ~~13~~ | ~~702~~ | ~~2.4~~ | ~~<5~~ | ~~6.4~~ | ~~71~~ | ~~18~~ | ~~65~~ | ~~1.0~~ | ~~47~~ | ~~1.3~~ | ~~3.6~~ | ~~13~~ | ~~28~~ | ~~15~~ | ~~0.6~~ | ~~2~~ | ~~10~~ | ~~26~~ | ~~24~~ | ~~22~~ | ~~44~~ | ~~7.8~~ | ~~13~~ |
| CAN TILL-2 | 26 | 2 | 540 | 4.0 | <5 | 12.2 | 98 | 15 | 74 | 12. | 150 | 1.0 | 3.7 | 11 | 44 | 47 | 0.6 | 14 | 20 | 36 | 32 | 31 | 143 | 0.8 | 12 |

continued

| Number | Sm | Sr | Ta | Tb | Th | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN TILL-3 | 3.3 | 300 | <0.5 | <0.5 | 4.6 | 2.1 | 62 | <1 | 17 | 1.5 | 56 | 230 |
| ~~CAN TILL-1~~ | ~~5.9~~ | ~~291~~ | ~~0.7~~ | ~~1.1~~ | ~~5.6~~ | ~~2.2~~ | ~~99~~ | ~~<1~~ | ~~38~~ | ~~3.9~~ | ~~98~~ | ~~502~~ |
| CAN TILL-2 | 7.4 | 144 | 1.9 | 1.2 | 18.4 | 5.7 | 77 | 5 | 40 | 3.7 | 130 | 390 |

partial extraction elements from dilute acid

| Number | Ag | Co | Cu | Fe% | Mn | Mo | Ni | Pb | Zn |
|---|---|---|---|---|---|---|---|---|---|
| CAN TILL-3 | 49 | 10 | 23 | 2.2 | 310 | 1 | 32 | 17 | 43 |
| ~~CAN TILL-1~~ | ~~<0.2~~ | ~~12~~ | ~~49~~ | ~~3.4~~ | ~~1020~~ | ~~1~~ | ~~17~~ | ~~14~~ | ~~71~~ |
| CAN TILL-2 | 12 | 12 | 152 | 3.4 | 570 | 13 | 30 | 24 | 116 |

continued partial extraction elements from concentrated acid

| Number | Ag | As | Ba | Bi | Cd | Co | Cr | Cu | Fe% | Hg* | Mn | Mo | Ni | Pb | V | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAN TILL-3 | 1.6 | 84 | 43 | <3 | <0.2 | 11 | 73 | 23 | 2.0 | 107 | 310 | <2 | 32 | 16 | 33 | 43 |
| ~~CAN TILL-1~~ | ~~0.2~~ | ~~13~~ | ~~84~~ | ~~<3~~ | ~~<0.2~~ | ~~12~~ | ~~30~~ | ~~48~~ | ~~3.1~~ | ~~92~~ | ~~950~~ | ~~<2~~ | ~~18~~ | ~~12~~ | ~~48~~ | ~~70~~ |
| CAN TILL-2 | 0.2 | 22 | 95 | 4 | 0.3 | 13 | 40 | 149 | 3.2 | 74 | 530 | 11 | 31 | 21 | 38 | 116 |

## CRM SOIL

analysis listed in mass % 100 g units

| Number | Type | $SiO_2$ | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $TiO_2$ | As | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2498-83 | Sandy, Turf-Ash | 91.24 | 3.36 | 0.27 | 0.99 | 1.23 | 0.13 | 0.011 | 0.51 | 0.036 | 0.29 | 0.0003 | 0.003 |
| VS 2507-83 | Black | 71.49 | 9.81 | 1.60 | 3.48 | 2.42 | 0.95 | 0.079 | 0.81 | 0.18 | 0.74 | 0.0008 | 0.0056 |
| VS 2508-83 | Black | 71.49 | 9.81 | 1.60 | 3.48 | 2.42 | 0.95 | 0.079 | 0.81 | 0.18 | 0.74 | 0.0021 | 0.0056 |
| VS 2509-83 | Black | 71.49 | 9.81 | 1.60 | 3.48 | 2.42 | 0.95 | 0.079 | 0.81 | 0.18 | 0.74 | 0.004 | 0.0056 |
| VS 2501-83 | Red | 59.18 | 17.01 | 0.17 | 7.86 | 0.98 | 0.92 | 0.051 | 0.15 | 0.10 | 1.56 | 0.0010 | 0.006 |
| VS 2502-83 | Red | 59.18 | 17.01 | 0.17 | 7.86 | 0.98 | 0.92 | 0.051 | 0.15 | 0.10 | 1.56 | 0.003 | 0.006 |
| VS 2503-83 | Red | 59.18 | 17.01 | 0.17 | 7.86 | 0.98 | 0.92 | 0.051 | 0.15 | 0.10 | 1.56 | 0.005 | 0.006 |
| VS 2504-83 | Grey | 52.65 | 11.48 | 11.47 | 4.60 | 2.09 | 2.99 | 0.089 | 1.64 | 0.17 | 0.64 | 0.0013 | 0.0063 |
| VS 2505-83 | Grey | 52.65 | 11.48 | 11.47 | 4.60 | 2.09 | 2.99 | 0.089 | 1.64 | 0.17 | 0.64 | 0.0029 | 0.0063 |
| VS 2506-83 | Grey | 52.65 | 11.48 | 11.47 | 4.60 | 2.09 | 2.99 | 0.089 | 1.64 | 0.17 | 0.64 | 0.006 | 0.0063 |

continued analysis listed in mass % except * which is mg/kg

| Number | Ba | Be* | Cd* | Ce | Co | Cr | Cs* | Cu | F | Ga* | Hg* | La* | Li | Mo* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2498-83 | 0.031 | 1.1 | 0.1 | 0.0017 | 0.00020 | 0.010 | 1.6 | 0.0009 | . | 5 | 0.03 | 10 | 0.00035 | 1.5 |
| VS 2507-83 | 0.050 | 2.0 | 0.10 | 0.007 | 0.0009 | 0.0083 | 4 | 0.0025 | 0.028 | 11 | 0.05 | 36 | 0.0023 | 1.2 |
| VS 2508-83 | 0.050 | 9 | 1.8 | 0.007 | 0.0046 | 0.0083 | 4 | 0.011 | 0.028 | 11 | 0.21 | 36 | 0.0023 | 6 |
| VS 2509-83 | 0.050 | 24 | 4.5 | 0.007 | 0.013 | 0.0083 | 4 | 0.027 | 0.028 | 11 | 0.4 | 36 | 0.0023 | 11 |
| VS 2501-83 | 0.027 | 1.6 | 0.12 | 0.007 | 0.0014 | 0.018 | 9 | 0.0047 | 0.04 | 15 | 0.08 | 30 | 0.005 | 3 |
| VS 2502-83 | 0.027 | 10 | 2.6 | 0.007 | 0.0063 | 0.018 | 9 | 0.017 | 0.04 | 15 | 0.26 | 30 | 0.005 | 8 |
| VS 2503-83 | 0.027 | 25 | 5 | 0.007 | 0.015 | 0.018 | 9 | 0.031 | 0.04 | 15 | 0.4 | 30 | 0.005 | 13 |
| VS 2504-83 | 0.050 | 2.2 | 0.3 | 0.006 | 0.0012 | 0.0084 | 5 | 0.0034 | 0.05 | 13 | 0.025 | 29 | 0.0032 | 1.4 |
| VS 2505-83 | 0.050 | 8 | 2.1 | 0.006 | 0.0057 | 0.0084 | 5 | 0.012 | 0.05 | 13 | 0.18 | 29 | 0.0032 | 6 |
| VS 2506-83 | 0.050 | 26 | 5.5 | 0.006 | 0.015 | 0.0084 | 5 | 0.029 | 0.05 | 13 | 0.4 | 29 | 0.0032 | 13 |

| Number | Nb* | Ni | Pb | Rb* | S | Sc* | Se* | Sn | Sr | V | Y* | Yb* | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2498-83 | 12 | 0.0010 | 0.0008 | 32 | . | 2.6 | (0.8) | 0.00019 | 0.0069 | 0.0014 | 13 | 1.5 | 0.0010 | 0.035 |
| VS 2507-83 | 14 | 0.0032 | 0.0018 | 88 | 0.05 | 11 | (3) | 0.0003 | 0.011 | 0.0072 | 31 | 4.1 | 0.0056 | 0.047 |
| VS 2508-83 | 14 | 0.011 | 0.009 | 88 | 0.05 | 11 | (3) | 0.0020 | 0.011 | 0.0072 | 31 | 4.1 | 0.018 | 0.047 |
| VS 2509-83 | 14 | 0.030 | 0.026 | 88 | 0.05 | 11 | (3) | 0.006 | 0.011 | 0.0072 | 31 | 4.1 | 0.046 | 0.047 |
| VS 2501-83 | 25 | 0.0054 | 0.0023 | 80 | 0.04 | 15 | (3) | 0.0005 | 0.005 | 0.018 | 27 | 3.6 | 0.0087 | 0.034 |
| VS 2502-83 | 25 | 0.016 | 0.015 | 80 | 0.04 | 15 | (3) | 0.0022 | 0.005 | 0.018 | 27 | 3.6 | 0.027 | 0.034 |
| VS 2503-83 | 25 | 0.038 | 0.028 | 80 | 0.04 | 15 | (3) | 0.006 | 0.005 | 0.018 | 27 | 3.6 | 0.061 | 0.034 |
| VS 2504-83 | 13 | 0.0045 | 0.0017 | 81 | 0.04 | 14 | (1) | 0.0004 | 0.031 | 0.009 | 26 | 3.3 | 0.0070 | 0.019 |
| VS 2505-83 | 13 | 0.013 | 0.010 | 81 | 0.04 | 14 | (1) | 0.0020 | 0.031 | 0.009 | 26 | 3.3 | 0.017 | 0.019 |
| VS 2506-83 | 13 | 0.032 | 0.028 | 81 | 0.04 | 14 | (1) | 0.006 | 0.031 | 0.009 | 26 | 3.3 | 0.039 | 0.019 |

## CRM SOIL

analysis listed in mass %

| Number | Si | Al | Ca | Fe | K | Mg | Mn | N | Na | P | Ti | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~GBW 08302~~ | ~~30.57~~ | ~~7.11~~ | ~~2.59~~ | ~~3.34~~ | ~~2.12~~ | ~~1.53~~ | ~~0.0677~~ | ~~0.128~~ | ~~1.52~~ | ~~0.086~~ | ~~0.40~~ | ~~15 g~~ |
| BCR 142R | . | . | . | . | . | . | 0.0970 | . | . | . | . | 40 g |
| ERM-CC690 | . | . | . | . | . | . | . | . | . | . | . | 70 g |

continued analysis listed in mg/kg except % which is mass %

| Number | As | B | Ba | Be | Br | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Hf | Hg | In | La | Lu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~GBW 08302~~ | ~~3.8~~ | ~~(25)~~ | ~~(509)~~ | ~~2.96~~ | ~~(1.3)~~ | ~~0.081~~ | ~~83.6~~ | ~~13.1~~ | ~~60.8~~ | ~~(7.3)~~ | ~~24.6~~ | ~~(5)~~ | ~~(239)~~ | ~~1.4~~ | ~~(13)~~ | ~~.~~ | ~~(7.3)~~ | ~~(0.018)~~ | ~~(0.06)~~ | ~~41.9~~ | ~~(0.48)~~ |
| BCR 142R | . | . | . | . | . | 0.34 | . | 12.1 | (113) | . | 69.7 | . | . | . | . | . | . | 0.067 | . | . | . |
| ERM-CC690 | . | . | . | . | . | . | 49.1 | . | . | . | . | 2.90 | . | . | . | 3.2 | . | . | . | 24.4 | . |

| Number | Mo | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se | Sm | Sr | Ta | Tb | Th | Tm | U | V | W | Y | Yb | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~GBW 08302~~ | ~~(0.8)~~ | ~~42.3~~ | ~~31.1~~ | ~~14.2~~ | ~~(9)~~ | ~~135~~ | ~~(0.4)~~ | ~~10.8~~ | ~~0.16~~ | ~~7.1~~ | ~~163~~ | ~~(1.1)~~ | ~~(0.9)~~ | ~~17.6~~ | ~~.~~ | ~~3.84~~ | ~~77.5~~ | ~~(3.5)~~ | ~~(25)~~ | ~~3.1~~ | ~~58~~ |
| BCR 142R | . | . | 64.5 | 40.2 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | (101) |
| ERM-CC690 | . | 19.1 | . | . | . | . | . | 7.9 | . | 3.5 | . | . | 0.50 | 7.6 | 0.232 | 1.90 | . | . | . | 1.57 | . |

**CRM SOIL**

analysis listed in mass % 70 g units

| Number | $Al_2O_3$ | C(tot) | CaO | $CO_2$ | C.Org | T.$Fe_2O_3$ | FeO | $H_2O+$ | $K_2O$ | MgO | Mn | N | $Na_2O$ | P | S | $SiO_2$ | Ti | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73319a | 12.9 | 7.8 | 2.7 | . | (6.8) | 4.4 | (2.25) | (4.3) | 2.85 | 1.17 | 0.131 | 0.32 | 1.65 | 0.23 | 0.0726 | 56.6 | 0.326 | 15.8 |
| NCS DC73320a | 11.7 | 1.37 | 4.0 | 2.4 | 0.71 | 4.2 | (0.78) | 2.8 | 3.03 | 1.40 | 0.092 | 0.075 | 2.67 | 0.0512 | 0.0316 | 65.9 | 0.28 | 5.8 |
| NCS DC73321a | 12.9 | 0.69 | 0.84 | . | 0.65 | 2.6 | (0.55) | 2.6 | 2.91 | 0.61 | 0.033 | 0.085 | 2.54 | 0.042 | (0.0146) | 72.9 | 0.22 | 3.7 |
| NCS DC73322a | 16.9 | 0.46 | (0.13) | . | 0.42 | 6.9 | (0.43) | 6.3 | 3.00 | 1.33 | 0.030 | 0.073 | (0.1) | 0.031 | 0.0130 | 63.3 | 0.46 | (6.97) |
| NCS DC73323a | 16.8 | (0.2) | (0.07) | . | (0.2) | 9.8 | (0.19) | 7.0 | 2.14 | 0.70 | 0.051 | 0.059 | (0.1) | 0.0353 | 0.0839 | 61.5 | 0.61 | 7.2 |
| NCS DC73324a | 26.6 | 0.23 | 0.13 | . | (0.2) | 12.3 | (0.1) | 12 | 0.44 | 0.20 | 0.23 | 0.021 | (0.14) | 0.024 | 0.0534 | 45.3 | 0.43 | (13.22) |
| NCS DC73325a | 27.3 | 1.3 | (0.2) | . | 1.18 | 18.0 | (1.46) | 13.6 | 0.35 | 0.31 | 0.19 | 0.13 | (0.1) | 0.21 | 0.0432 | 33.7 | 2.06 | 15.3 |
| NCS DC73326a | 11.8 | 1.91 | 7.5 | 5.3 | 0.50 | 4.3 | 1.23 | 3.4 | 2.30 | 2.00 | 0.063 | 0.06 | 1.71 | 0.068 | 0.0187 | 60.1 | 0.37 | 8.9 |

analysis listed in mg/kg

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | F | Ga | Gd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73319a | 0.81 | 33 | 69 | 700 | 3.3 | 1.4 | 4.1 | 2.5 | 71 | (87) | 10.3 | 44 | 7.2 | 42 | 6.0 | 3.8 | 0.89 | 513 | 18.1 | 5.5 |
| NCS DC73320a | 0.072 | 18 | 27 | 1187 | 2.6 | 0.29 | 4.6 | 0.2 | 123 | (51) | 11.1 | 52 | 4.7 | 20 | 4.5 | 2.5 | 1.8 | 723 | 14.8 | 6.2 |
| NCS DC73321a | 0.075 | 6.2 | 21 | 1117 | 1.7 | 0.21 | 3.8 | 0.079 | 45 | (73) | 6.9 | 35 | 3.2 | 13.4 | 2.8 | 1.7 | 0.8 | 354 | 15.7 | 3.1 |
| NCS DC73322a | 0.059 | 9.6 | 88 | 312 | 2.4 | 1.8 | 2.8 | 0.11 | 99 | (30) | 20 | 81 | 12.5 | 43 | 4.4 | 2.5 | 1.2 | 1127 | 23 | 5.5 |
| NCS DC73323a | 4.6 | 242 | 108 | 343 | 1.8 | 23 | (1.5) | 0.16 | 85 | (31) | 18 | 113 | 18 | 147 | 5.1 | 3.2 | 1.0 | 601 | 25 | 4.5 |
| NCS DC73324a | 0.24 | 88 | 28 | 181 | 6.9 | 89 | (1.1) | (0.5) | 85 | 110 | 20 | 86 | 9.4 | 358 | 5.4 | 3.7 | 0.39 | 1526 | 40 | 4.2 |
| NCS DC73325a | 0.08 | (4.2) | (19) | 237 | 2.9 | (0.37) | 6.4 | (0.23) | 113 | (54) | 93 | 379 | 2.9 | 84 | 5.7 | 2.4 | 3.0 | 341 | 39 | 8.3 |
| NCS DC73326a | 0.067 | 13.2 | 51 | 492 | 2.0 | 0.31 | 3.7 | 0.14 | 68 | 68 | 12.3 | 65 | 7.3 | 24 | 4.9 | 2.7 | 1.2 | 555 | 15.1 | 5.5 |

| Number | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73319a | 1.3 | 6.5 | 0.31 | 1.3 | 2.0 | 0.12 | 39 | 28 | 0.57 | 2.0 | 15.3 | 30.8 | 16.9 | 339 | 8.5 | 137 | 2.4 | 8.3 | 0.22) |
| NCS DC73320a | 1.2 | 6.3 | 0.017 | 0.9 | 2.6 | 0.048 | 61 | 22 | 0.38 | 1.6 | 35 | 55 | 24 | 27 | 14.8 | 95 | 0.86 | 9.5 | 0.26 |
| NCS DC73321a | 1.2 | 7.1 | 0.116 | 0.58 | 2.5 | 0.033 | 21 | 18 | 0.28 | 0.5 | 10.6 | 19 | 15 | 28 | 4.9 | 85 | 0.69 | 5.6 | 0.12 |
| NCS DC73322a | 1.7 | 6.9 | 0.072 | 0.85 | 4.0 | 0.095 | 54 | 27 | 0.40 | 0.70 | 16.1 | 40 | 36 | 37 | 11.2 | 152 | 1.4 | 15.9 | 0.31 |
| NCS DC73323a | 2.3 | 8.3 | 0.7 | 1.1 | 2.8 | 1.4 | 35 | 51 | 0.49 | 2.3 | 20 | 27 | 38 | 245 | 7.3 | 142 | 14.9 | 16.9 | 0.75 |
| NCS DC73324a | 6.2 | 6.5 | 0.086 | 1.1 | 13.2 | 4.1 | 31 | 43 | 0.80 | 169 | 38 | 20 | 75 | 478 | 5.6 | 118 | 14 | 17 | 0.47 |
| NCS DC73325a | 1.5 | 8.9 | 0.058 | 1.0 | 19.0 | 0.11 | 56 | 23 | 0.30 | 3.2 | 80 | 47 | 217 | 18.3 | 11.7 | 28 | 0.53 | 25 | 0.34 |
| NCS DC73326a | 1.3 | 6.9 | 0.027 | 0.98 | 1.6 | 0.053 | 35 | 33 | 0.042 | 0.76 | 13.1 | 31 | 30 | 21 | 8.0 | 96 | 1.2 | 11.5 | 0.098 |

| Number | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73319a | 5.9 | 9.8 | 192 | 1.3 | 0.98 | (0.06) | 13.1 | 1.2 | 0.61 | 6.3 | 61 | 3.5 | 38 | 3.8 | 475 | 218 |
| NCS DC73320a | 7.9 | 2.0 | 249 | (0.86) | 0.89 | (0.037) | 13.3 | 0.63 | 0.38 | 1.9 | 65 | 1.9 | 25 | 2.5 | 58 | 219 |
| NCS DC73321a | 3.5 | 2.6 | 325 | 1.2 | 0.50 | (0.04) | 6.7 | 0.51 | 0.28 | 1.2 | 45 | 1.1 | 16 | 1.8 | 39 | 247 |
| NCS DC73322a | 6.8 | 5.6 | 58 | 1.4 | 0.84 | (0.085) | 19 | 1.0 | 0.4 | 3.0 | 125 | 2.9 | 23 | 2.6 | 92 | 234 |
| NCS DC73323a | 4.5 | 7.2 | 39 | 1.6 | 0.80 | 6.6 | 17.2 | 1.1 | 0.5 | 4.0 | 136 | 7.4 | 29 | 3.2 | 172 | 272 |
| NCS DC73324a | 4.7 | 439 | 30 | 16 | 0.84 | (0.5) | 35 | 3.6 | 0.7 | 28 | 108 | 132 | 33 | 5.2 | 1529 | 156 |
| NCS DC73325a | 9.3 | 5.0 | 37 | 5.7 | 1.2 | (0.06) | 10.5 | 0.3 | 0.33 | 2.6 | 240 | 2.3 | 25 | 2.0 | 187 | 370 |
| NCS DC73326a | 6.0 | 2.9 | 197 | 1.1 | 0.86 | (0.034) | 12.2 | 0.57 | 0.43 | 2.3 | 80 | 1.8 | 26 | 2.8 | 66 | 241 |

**CRM SOIL**

analysis listed in mass % T = Total 100 g units

| Number | Type | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | $Cr_2O_3$ | FeO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC85112 | Agricultural | 83.34 | 8.89 | . | (0.16) | . | . | 1.34 | 0.65 | (0.20) | 0.015 | (0.038) | 0.124 | (0.014) | 0.22 | 4.86 |
| VS 5360-90 | Sod-Pozolic | 78.3 | 9.58 | . | 0.82 | . | 0.5 | 3.00 | 2.48 | 0.77 | 0.070 | 1.15 | 0.075 | 0.03 | 0.84 | 2.6 |
| SARM 42 | Sedimentary | 74.09 | 10.03 | . | 0.89 | 0.63 | (4.0) | 4.68 | 0.45 | 1.92 | 0.10 | (0.15) | (0.03) | (0.02) | 0.36 | . |
| NCS DC85111 | Agricultural | 69.68 | 14.58 | . | (0.22) | . | . | 5.21 | 1.08 | 0.54 | 0.029 | (0.090) | 0.122 | (0.014) | 0.96 | 7.52 |
| NCS DC85107 | Agricultural | 65.37 | 15.06 | . | 1.68 | . | . | 4.98 | 2.72 | 1.62 | 0.094 | 2.48 | 0.120 | (0.013) | 0.74 | 4.83 |
| NCS DC85108 | Agricultural | 63.06 | 12.76 | . | 4.57 | . | . | 4.49 | 2.43 | 2.01 | 0.077 | 1.69 | 0.162 | (0.017) | 0.68 | 7.71 |
| NCS DC85110 | Agricultural | 61.03 | 16.21 | . | 0.84 | . | . | 6.20 | 2.45 | 1.90 | 0.050 | 0.99 | 0.098 | (0.033) | 0.92 | 9.01 |
| NCS DC85109 | Agricultural | 53.72 | 14.74 | . | 7.93 | . | . | 5.72 | 2.72 | 2.09 | 0.106 | 0.99 | 0.197 | (0.019) | 0.65 | 11.17 |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | B% | Ba% | Be | C% | Ce% | Co | Cr% | Cs | Cu | F% | Ga | Ge | La | Li |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC85112 | . | (0.0020) | . | . | . | . | . | . | . | 2.8 | . | . | . | . | . |
| VS 5360-90 | 0.08 | 0.004 | 0.051 | 1.5 | 0.55 | 0.005 | 10 | 0.008 | 0.21 | 18 | 0.021 | 9 | . | 35 | 16 |
| SARM 42 | . | . | (0.0250) | . | . | (0.0030) | 35 | . | . | 17 | . | (12) | . | . | . |
| NCS DC85111 | . | 0.0071 | . | . | . | . | . | . | . | 32 | . | . | . | . | . |
| NCS DC85107 | . | 0.0034 | . | . | . | . | . | . | . | 24 | . | . | . | . | . |
| NCS DC85108 | . | 0.0054 | . | . | . | . | . | . | . | 25 | . | . | . | . | . |
| NCS DC85110 | . | 0.0065 | . | . | . | . | . | . | . | 42 | . | . | . | . | . |
| NCS DC85109 | . | 0.0075 | . | . | . | . | . | . | . | 29 | . | . | . | . | . |

| Number | Mo | Nb | Ni | Pb | Rb | Sc | Sn | Sr% | Th | V% | Y | Yb | Zn | Zr% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC85112 | 1.15 | . | . | . | . | . | . | . | . | . | . | . | 22 | . | |
| VS 5360-90 | 0.8 | 20 | 25 | 15 | 78 | 9 | 2.6 | 0.0012 | . | 0.0064 | 27 | 4 | 42 | 0.053 | last |
| SARM 42 | (5) | (8) | 125 | (10) | 22 | . | . | 0.0037 | (5) | 0.0094 | 11 | . | 44 | 0.0192 | |
| NCS DC85111 | 1.47 | . | . | . | . | . | . | . | . | . | . | . | 81 | . | |
| NCS DC85107 | 0.80 | . | . | . | . | . | . | . | . | . | . | . | 67 | . | |
| NCS DC85108 | (0.82) | . | . | . | . | . | . | . | . | . | . | . | 68 | . | |
| NCS DC85110 | 0.73 | . | . | . | . | . | . | . | . | . | . | . | 93 | . | |
| NCS DC85109 | 1.53 | . | . | . | . | . | . | . | . | . | . | . | 96 | . | |

## CRM SOIL WITH EXTENSIVE ANALYSIS

analysis listed in mass % Org = Organic Sol = Soluble T = Total 50 g units

| Number | $Al_2O_3$ | C | Org.C | CaO | F | T.$Fe_2O_3$ | $K_2O$ | MgO | Mn | N | $Na_2O$ | P | S | $SiO_2$ | Ti | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71008 | 10.31 | 7.90 | 4.73 | 15.0 | 0.0532 | 4.83 | 1.628 | 1.24 | 0.0648 | 0.281 | 0.709 | 0.0887 | 0.111 | 43.85 | 0.315 | 0.0201 |
| NCS ZC71009 | 15.41 | 2.81 | 2.75 | 1.000 | 0.0566 | 5.24 | 1.78 | 0.932 | 0.0438 | 0.276 | 1.00 | 0.0660 | 0.0502 | 62.54 | 0.493 | 0.0221 |
| NCS ZC71010 | 13.17 | 2.45 | 2.36 | 1.085 | 0.0520 | 4.97 | 1.732 | 0.973 | 0.0517 | 0.218 | 1.19 | 0.0833 | 0.0447 | 66.9 | 0.476 | 0.0230 |
| NCS ZC71011 | 9.45 | 1.11 | 1.07 | 0.412 | 0.0353 | 3.89 | 1.45 | 0.512 | 0.0424 | 0.120 | 0.475 | 0.0420 | 0.0364 | 77.1 | 0.571 | 0.00897 |
| NCS ZC71012 | 15.30 | 0.62 | 0.59 | 1.420 | 0.0762 | 9.06 | 3.11 | 0.783 | 0.0725 | 0.0613 | 1.11 | 0.106 | 0.301 | 61.5 | 0.410 | 0.0260 |
| NCS ZC71013 | 16.27 | 1.29 | 1.12 | 1.28 | 0.128 | 7.23 | 2.62 | 1.223 | 0.117 | 0.154 | 0.35 | 0.0863 | 0.0222 | 61.5 | 0.546 | 0.0117 |
| NCS ZC71014 | 11.77 | 1.56 | 1.04 | 3.65 | 0.0450 | 3.68 | 2.39 | 1.85 | 0.0503 | 0.107 | 2.17 | 0.105 | 0.0238 | 67.41 | 0.330 | 0.00644 |
| NCS ZC71015 | 11.94 | 1.23 | 1.18 | 1.22 | 0.0504 | 6.37 | 3.17 | 1.53 | 0.104 | 0.126 | 1.52 | 0.110 | 0.0470 | 67.4 | 0.495 | 0.0269 |
| NCS ZC71016 | 12.57 | 2.66 | 2.23 | 3.73 | 0.0757 | 4.78 | 2.74 | 3.76 | 0.0864 | 0.243 | 2.21 | 0.339 | 0.0644 | 59.7 | 0.397 | 0.0302 |
| NCS ZC71017 | 18.52 | 1.61 | 0.91 | 0.376 | 0.0547 | 4.74 | 2.65 | 0.609 | 0.0498 | 0.170 | 0.605 | 0.125 | 0.0308 | 61.8 | 0.536 | 0.0133 |
| NCS ZC71018 | 12.34 | 1.44 | 0.79 | 0.414 | 0.0441 | 5.98 | 1.79 | 1.34 | 0.0417 | 0.149 | 0.470 | 0.0607 | 0.0281 | 69.52 | 0.492 | 0.0261 |
| NCS ZC71019 | 10.52 | 0.84 | 0.468 | 1.51 | 0.0440 | 6.54 | 2.46 | 0.697 | 0.297 | 0.0693 | 0.428 | 0.0430 | 0.0468 | 72.28 | 0.306 | 0.0224 |

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cu | Dy | Er | Eu | Sol.F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71008 | 0.56 | 22.5 | 41 | 448 | 2.15 | 1.68 | 4.5 | 2.02 | 67 | 94 | 13.4 | 70 | 76 | 4.13 | 2.36 | 1.14 | 8.3 |
| NCS ZC71009 | 0.44 | 83.4 | 60 | 502 | 2.62 | 47.8 | 6.0 | 14.2 | 83 | 69 | 14.4 | 92 | 69.8 | 5.63 | 3.15 | 1.48 | 8.7 |
| NCS ZC71010 | 0.91 | 12.5 | 66 | 480 | 2.32 | 0.58 | 5.2 | 0.276 | 79 | 119 | 13.7 | 78.2 | 104 | 5.53 | 3.1 | 1.44 | 6.8 |
| NCS ZC71011 | 0.259 | 41.9 | 92 | 351 | 1.55 | 1.99 | 1.8 | 0.276 | 87 | 45 | 13.4 | 59.0 | 69 | 5.04 | 2.99 | 1.16 | 1.89 |
| NCS ZC71012 | 7.5 | 222 | 50 | 713 | 1.75 | 6.0 | 1.8 | 0.62 | 70.2 | 52 | 9.17 | 27.5 | 301 | 3.23 | 1.79 | 1.44 | 1.53 |
| NCS ZC71013 | 0.128 | 19.3 | 70 | 386 | 2.79 | 0.62 | 4.55 | 0.398 | 87 | 34 | 23.9 | 87.0 | 53.1 | 5.41 | 3.16 | 1.4 | 4.3 |
| NCS ZC71014 | 0.088 | 8.8 | 38.2 | 592 | 1.75 | 0.259 | 5.2 | 0.238 | 56.5 | 91 | 10.1 | 60.6 | 21.7 | 3.79 | 2.19 | 1.12 | 7.2 |
| NCS ZC71015 | 5.4 | 398 | 64.1 | 713 | 1.90 | 10.9 | 4.5 | 2.14 | 70 | 74 | 15.0 | 65.3 | 76 | 4.59 | 2.64 | 1.36 | 8.7 |
| NCS ZC71016 | 0.46 | 13.8 | 29.8 | 863 | 1.99 | 0.559 | 5.1 | 2.71 | 73.8 | 98 | 12.5 | 60.0 | 244 | 3.87 | 2.11 | 1.41 | 3.3 |
| NCS ZC71017 | 0.162 | 6.2 | 26.2 | 515 | 3.70 | 0.77 | 3.93 | 0.293 | 135 | 74 | 11.7 | 39.9 | 56.3 | 6.7 | 3.68 | 1.69 | 5.1 |
| NCS ZC71018 | 1.61 | 349 | 65 | 511 | 2.12 | 3.29 | 2.83 | 2.58 | 83 | 54 | 16.1 | 215 | 244 | 4.39 | 2.55 | 1.21 | 2.2 |
| NCS ZC71019 | 2.21 | 8.9 | 11.5 | 521 | 2.25 | 9.6 | 2.1 | 0.636 | 61 | 52 | 8.74 | 43.5 | 74 | 3.43 | 2.04 | 0.87 | 3.9 |

| Number | Ga | Gd | Ge | Hg | Ho | I | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71008 | 13.2 | 4.55 | 1.33 | 0.205 | 0.83 | 2.77 | 36.7 | 38.4 | 0.361 | 4.28 | 11.5 | 28.7 | 28.7 | 92 | 7.7 | 78 | 3.4 |
| NCS ZC71009 | 19.5 | 6.15 | 1.61 | 0.62 | 1.12 | 2.19 | 45.5 | 46.7 | 0.459 | 1.1 | 17.0 | 37.8 | 40.9 | 372 | 10.0 | 114 | 22.1 |
| NCS ZC71010 | 16.7 | 6.03 | 1.48 | 3.44 | 1.09 | 1.58 | 42.7 | 41.1 | 0.456 | 0.63 | 16.4 | 36.9 | 34.7 | 153 | 9.9 | 101 | 2.03 |
| NCS ZC71011 | 12.6 | 5.27 | 1.35 | 0.074 | 1.02 | 1.11 | 42.3 | 29.9 | 0.45 | 1.40 | 19.5 | 34.2 | 19.2 | 42.4 | 9.3 | 72 | 1.62 |
| NCS ZC71012 | 21.5 | 4.20 | 1.35 | 0.087 | 0.63 | 1.37 | 40.3 | 18.7 | 0.272 | 26.4 | 14.8 | 29.1 | 9.9 | 340 | 8.0 | 109 | 27.3 |
| NCS ZC71013 | 21.8 | 5.8 | 1.72 | 0.133 | 1.12 | 3.54 | 43.0 | 49.0 | 0.49 | 1.42 | 18.1 | 37.1 | 43.9 | 40.9 | 9.9 | 129 | 2.08 |
| NCS ZC71014 | 14.2 | 4.20 | 1.22 | 0.052 | 0.76 | 2.72 | 30.5 | 23.9 | 0.339 | 0.54 | 10.9 | 26.1 | 23.9 | 23.2 | 7.0 | 85.6 | 0.69 |
| NCS ZC71015 | 15.5 | 5.04 | 1.4 | 0.101 | 0.92 | 2.38 | 36.5 | 33.3 | 0.406 | 1.30 | 16.5 | 32.0 | 29.9 | 1050 | 8.46 | 98.1 | 6.3 |
| NCS ZC71016 | 16.0 | 4.77 | 1.27 | 0.061 | 0.76 | 2.73 | 39.5 | 23.7 | 0.314 | 2.53 | 13.1 | 33.3 | 22.8 | 50.9 | 8.9 | 85.1 | 0.84 |
| NCS ZC71017 | 24.2 | 7.8 | 1.4 | 0.157 | 1.26 | 1.79 | 69.8 | 25.1 | 0.57 | 2.49 | 24.2 | 53 | 17.2 | 60 | 14.9 | 154 | 0.72 |
| NCS ZC71018 | 15.8 | 4.8 | 1.69 | 0.231 | 0.90 | 1.96 | 46 | 43.3 | 0.396 | 2.67 | 18.9 | 33.3 | 90.6 | 166 | 9.3 | 99 | 7.8 |
| NCS ZC71019 | 14.7 | 3.65 | 2.09 | 0.085 | 0.70 | 2.86 | 32.7 | 21.6 | 0.340 | 7.3 | 19.4 | 24.5 | 10.9 | 467 | 6.9 | 127 | 0.59 |

| Number | Sc | Se | Sm | Sn | Sr | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71008 | 10.0 | 1.96 | 5.40 | 7.6 | 236 | 0.74 | 11.0 | 1.26 | 0.363 | 3.19 | 86.6 | 4.6 | 23.7 | 2.3 | 169 |
| NCS ZC71009 | 15.4 | 1.86 | 7.03 | 27.9 | 99.3 | 0.99 | 15.0 | 1.28 | 0.479 | 2.93 | 112 | 2.56 | 30 | 3.01 | 232 |
| NCS ZC71010 | 12.6 | 0.44 | 6.95 | 54 | 103 | 0.97 | 13.5 | 0.65 | 0.47 | 2.64 | 95.1 | 2.31 | 29.1 | 2.95 | 270 |
| NCS ZC71011 | 9.3 | 0.412 | 6.20 | 5.1 | 72.1 | 0.85 | 13.5 | 0.536 | 0.461 | 2.86 | 81.4 | 3.13 | 28.1 | 2.92 | 377 |
| NCS ZC71012 | 7.3 | 2.82 | 5.08 | 10.0 | 260 | 0.606 | 9.9 | 0.977 | 0.274 | 3.19 | 91 | 4.63 | 16.7 | 1.76 | 222 |
| NCS ZC71013 | 16.2 | 0.52 | 6.7 | 11.0 | 120 | 0.93 | 14.6 | 0.94 | 0.49 | 3.73 | 132 | 2.28 | 28.8 | 3.13 | 212 |
| NCS ZC71014 | 9.4 | 0.259 | 4.92 | 2.63 | 262 | 0.667 | 8.1 | 0.558 | 0.337 | 1.46 | 66.4 | 1.39 | 20.4 | 2.17 | 246 |
| NCS ZC71015 | 10.8 | 0.62 | 5.92 | 2.95 | 163 | 0.81 | 9.9 | 0.598 | 0.408 | 2.07 | 88 | 3.25 | 23.9 | 2.61 | 296 |
| NCS ZC71016 | 9.7 | 0.495 | 5.78 | 2.3 | 304 | 0.710 | 7.52 | 0.699 | 0.321 | 1.93 | 76.1 | 2.57 | 20.1 | 2.05 | 247 |
| NCS ZC71017 | 12.2 | 0.45 | 9.4 | 9.1 | 80 | 1.22 | 36.7 | 1.25 | 0.54 | 10.1 | 100 | 3.92 | 34.5 | 3.6 | 304 |
| NCS ZC71018 | 11.5 | 1.19 | 5.88 | 5.6 | 79 | 0.76 | 15.7 | 0.83 | 0.394 | 4.27 | 96 | 6.7 | 22.4 | 2.5 | 276 |
| NCS ZC71019 | 7.2 | 2.02 | 4.5 | 20.3 | 74 | 0.60 | 13.9 | 1.06 | 0.326 | 3.14 | 55 | 8.7 | 17.8 | 2.2 | 287 |

## CRM SOIL - CONTAMINATED

certified analysis listed in mg/kg T = Total

| Number | As | B | Be | Cd | Co | Cr | Cu | F | Hg | Mn | Ni | Pb | Se | V | Zn | Type | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BAM U110 * | 15.8 | . | . | 7.3 | 16.2 | 230 | 263 | . | 51.5 | 621 | 101 | 197 | . | . | 1000 | | 60 g |
| JSAC 0411 | 11.3 | . | 1.04 | 0.274 | . | 23.5 | 26.7 | . | . | 943 | 11 | 18.9 | 1.32 | 68.6 | 64.6 | Volcanic Ash Soil | 50 g |
| JSAC 0401 | 10.62 | . | 5.28 | 4.25 | . | 50.4 | 15.3 | . | . | 266 | 18.9 | 26 | 0.27 | 65.0 | 66.8 | Brown Forest Soil | 50 g |

* Aqua Regia values for BAM U110 listed under "Soil - Aqua Regia Method" in this catalog

## CRM SOIL - CONTAMINATED

analysis listed in mass % except as noted powder 75 g

| Number | Hexavalent Cr | Cr | Fe | Mn | Al | Tot.Org.C | Ca | K | Mg | Na | Si | Ti | V | PH | Redox Potential |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SRM 2701 | 0.05512 | 4.26 | 23.73 | 0.2137 | (5.05) | (3.69) | (7.47) | (0.174) | (7.47) | (0.255) | (4.17) | (0.547) | (0.236) | 9.6 | (526 mV) |

## CRM SOIL - CYANIDE

analysis in mg/kg powder

| Number | Total Cyanide | Uncertainty | Units | |
|---|---|---|---|---|
| BAM U114 | 23.1 | 1.3 | 66 g | last of stock |
| CGL 306 | 12.0 | 0.8 | 100 g | |

## SOIL - CONTAMINATED

# = class where 1 = CRM and 2 = RM  analysis listed in mg/kg except % which is mass %  CETEM: 80 g  all others: 50-55 g units

| # Number | Ag | Al% | As | Au | B | Ba | Be | Bi | Br | C% | Ca% | Cd | Ce | Co | Cr | Cs | Cu | Dy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 SRM 2780a | 72.5 | 8.43 | 65.9 | 6.6 | (27) | 930 | (1.1) | (45) | . | (0.19) | 0.247 | (4.8) | 67.7 | 16.5 | 205 | 8.3 | 240 | (3.1) |
| 1 SRM 2710a | (40) | 5.95 | 1,540 | (0.2) | (20) | 792 | . | . | . | . | 0.964 | 12.3 | (60) | 5.99 | (23) | (8.25) | 342 | (3) |
| 1 IRNT SVM ** | (4) | (8.96) | 13.6 | . | (70) | 582 | (500) | . | (5) | . | (0.692) | 0.214 | (100) | 15.4 | 79.8 | (6) | 30.0 | (5) |
| 1 IRNT SSP ** | (5) | (7.48) | 14.0 | . | . | 315 | . | . | . | . | 6.34 | 0.285 | . | 15.6 | 75.3 | . | 30.9 | . |
| ~~1 SRM 2709a~~ | ~~.~~ | ~~7.37~~ | ~~(10.5)~~ | ~~.~~ | ~~(74)~~ | ~~979~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.91~~ | ~~0.371~~ | ~~(42)~~ | ~~12.8~~ | ~~130~~ | ~~(5.0)~~ | ~~(33.9)~~ | ~~(3)~~ |
| 1 SRM 2586 | . | 6.652 | 8.7 | . | . | 413 | (1.4) | . | . | . | 2.218 | 2.71 | 58 | (35) | 301 | . | (81) | (5.4) |
| 1 SRM 2587 | . | 5.86 | 13.7 | . | . | 568 | (9.2) | . | . | . | 0.927 | 1.92 | (57) | (14) | 92 | . | (160) | . |

continued

| Number | Er | Eu | Fe% | Ga | Gd | Ge | Hf | Hg | Ho | In | K% | La | Li | Lu | Mg% | Mn% | Mo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SRM 2780a | (2.0) | (0.9) | 8.75 | (21) | (3.2) | (<6) | (5.5) | (0.2) | (0.7) | (1.65) | 3.99 | 34.4 | (14) | (0.33) | 0.465 | 0.0490 | 25.0 |
| SRM 2710a | . | (0.82) | 4.32 | . | (3.0) | . | (7) | 9.88 | . | . | 2.17 | 30.6 | . | (0.3) | 0.734 | 0.214 | . |
| IRNT SVM ** | . | (2) | 3.73 | . | (7) | . | (10) | 0.171 | . | . | 3.08 | (60) | (30) | (500) | (0.593) | 0.0897 | . |
| IRNT SSP ** | . | . | 3.73 | . | . | . | . | 0.0874 | . | . | 2.63 | . | . | . | (1.19) | 0.0734 | . |
| ~~SRM 2709a~~ | ~~.~~ | ~~(0.83)~~ | ~~3.36~~ | ~~.~~ | ~~(3.0)~~ | ~~.~~ | ~~(4)~~ | ~~(0.9)~~ | ~~.~~ | ~~.~~ | ~~2.11~~ | ~~(21.7)~~ | ~~.~~ | ~~(0.3)~~ | ~~1.46~~ | ~~0.0529~~ | ~~.~~ |
| SRM 2586 | (3.3) | (1.5) | 5.161 | (14) | (5.8) | . | . | 0.367 | (1.1) | . | 0.976 | 29.7 | (25) | . | 1.707 | 0.1000 | . |
| SRM 2587 | . | . | 2.813 | (13) | . | . | . | 0.29 | . | . | 1.583 | (29) | (32) | . | 0.6690 | 0.0651 | . |

continued

| Number | Na% | Nb | Nd | Ni | P% | Pb% | Pr | Rb | Re | S% | Sb | Sc | Se | Si% | Sm | Sn | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SRM 2780a | 0.108 | (20) | 28.3 | 95 | 0.0286 | 0.665 | (8) | 220 | (0.003) | 8.85 | 18.3 | 15.6 | (6) | 24.1 | 4.7 | (7.2) | 121 |
| SRM 2710a | 0.894 | . | (22) | (8) | 0.105 | 0.552 | . | (117) | . | . | 52.5 | (9.9) | (1) | 31.1 | (4.0) | . | 255 |
| IRNT SVM ** | (0.3) | . | (50) | 30.8 | (0.000013) | 0.00196 | . | (200) | . | . | 4.58 | (15) | ( 300) | 25 | (10) | . | (82.0) |
| IRNT SSP ** | . | . | . | 37.4 | . | 0.00413 | . | . | . | . | 2.11 | . | . | . | . | . | 274 |
| ~~SRM 2709a~~ | ~~1.22~~ | ~~.~~ | ~~(17)~~ | ~~(85)~~ | ~~0.0688~~ | ~~0.00173~~ | ~~.~~ | ~~(99)~~ | ~~.~~ | ~~.~~ | ~~1.55~~ | ~~(11.1)~~ | ~~(1.5)~~ | ~~30.3~~ | ~~(4)~~ | ~~.~~ | ~~239~~ |
| SRM 2586 | 0.468 | (6) | 26.4 | (75) | 0.1001 | 0.0432 | (7.3) | . | . | . | . | (24) | (0.6) | 29.15 | (6.1) | . | 84.1 |
| SRM 2587 | 1.127 | (14) | (25) | (36) | 0.0970 | 0.3242 | . | . | . | . | . | (11) | . | 33.13 | . | . | 126 |

continued

| Number | Ta | Tb | Te | Th | Ti% | Tl | Tm | U | V | W | Y | Yb | Zn% | Zr | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SRM 2780a | (1.2) | (0.5) | (22) | 12.0 | 0.643 | (5.5) | (0.31) | 4.0 | 152 | (17.4) | (18) | (2) | 0.102 | 206 | LOI: (11.1) |
| SRM 2710a | (0.9) | (0.5) | . | (18.1) | 0.311 | (1.52) | . | 9.11 | (82) | (190) | . | (2) | 0.418 | (200) | |
| IRNT SVM ** | (1) | (1) | . | (20) | 0.55 | (<200) | . | (3) | 98.3 | (3) | . | (4) | 0.00888 | (350) | last |
| IRNT SSP ** | . | . | . | . | . | . | . | . | 89.7 | . | . | . | 0.0119 | (200) | last |
| ~~SRM 2709a~~ | ~~(0.7)~~ | ~~(0.5)~~ | ~~.~~ | ~~(10.9)~~ | ~~0.336~~ | ~~(0.58)~~ | ~~.~~ | ~~(3.15)~~ | ~~110~~ | ~~.~~ | ~~.~~ | ~~(2)~~ | ~~(0.0103)~~ | ~~195~~ | ~~last~~ |
| SRM 2586 | . | (0.09) | . | (7) | 0.605 | . | (0.5) | . | (160) | . | (21) | 2.64 | 0.0352 | . | |
| SRM 2587 | . | . | . | (7.5) | 0.3920 | . | . | . | (78) | . | (15) | (1.6) | 0.03358 | . | |

** IRNT certificates expired, however use and sales continue without problems worldwide

## RM STEATITE

analysis listed in mass %  25 or 100 g units

| Number | $SiO_2$ | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|
| CERAM 2CAS14 | 62.7 | 0.149 | 0.249 | 0.314 | 0.002 | 31.28 | 0.008 | 0.005 | 5.10 |

## CRM SULPHUR

| Number | Recommended S Value (%) | 95% Confidence Limits Low% | High% | Standard Deviation of Laboratories (%) Between | Within | Number of Sets | Results | Units |
|---|---|---|---|---|---|---|---|---|
| CAN HCC-1 | 33.92 | 33.80 | 34.03 | 0.14 | 0.095 | 9 | 53 | 50 g |
| CAN INM-1 | 22.17 | 21.97 | 22.37 | 0.24 | 0.051 | 9 | 53 | 50 g |

## CRM SULPHUR IN VARIOUS FORMS - SEE ALSO "MULTI-METAL ORE"

analysis listed in mass %

| Number | Type | S | $SO_4$ | Al | $CO_2$ | Ca | Cu | Fe | $H_2O$ | Mg | Pb | Si | Zn | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71307 | Sulphide | 52.72 | . | . | . | . | 0.0431 | 46.08 | . | . | (0.00234) | . | 0.0219 | . | 5 g |
| NCS DC71308 | Sulphide | 34.69 | . | . | . | . | 33.30 | 30.30 | . | . | 0.0128 | . | 0.30 | . | 5 g |
| CAN HCC-1 | Concentrate | 33.92 | . | . | . | . | . | . | . | . | . | . | . | . | 50 g |
| NCS DC71310 | Sulphide | 32.33 | . | . | . | . | 0.10 | 2.14 | . | . | 0.099 | . | 62.51 | . | 5 g |
| CAN WMS-1A | Sulphide | 28.17 | . | 1.350 | . | 3.09 | 1.396 | 45.4 | (0.2) | (0.331) | (0.0033) | (4.7) | (0.0130) | . | 200 g |
| CAN INM-1 | Concentrate | 22.17 | . | . | . | . | . | . | . | . | . | . | . | . | 50 g |
| NCS DC71309 | Sulphide | 13.30 | . | . | . | . | 0.00624 | 0.0127 | . | . | 84.26 | . | 0.0533 | . | 5 g |
| CAN RTS-3a | Ore Tailings | 9.59 | (1.1) | 5.12 | 0.04 | 2.14 | 0.2353 | 20.49 | . | 2.483 | 0.0209 | 18.28 | 0.2890 | (10.6) | 100 g |

continued analysis listed in mass %

| Number | C | Cd | Co | K | Mn | Na | Ni | P | Sb | Sn | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71307 | . | 0.000071 | (0.00039) | . | 0.00289 | . | 0.00340 | . | 0.00011 | (0.00027) | . |
| NCS DC71308 | . | 0.00202 | 0.00751 | . | 0.00475 | . | 0.00413 | . | (0.00027) | (0.00058) | . |
| CAN HCC-1 | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC71310 | . | 0.15 | 0.0491 | . | 0.0169 | . | 0.00432 | . | 0.0249 | (0.00032) | . |
| CAN WMS-1A | (0.1) | (0.00014) | (0.145) | (0.0991) | (0.0600) | (0.0329) | 3.02 | (0.018) | (0.000692) | (0.00023) | (0.0840) |
| CAN INM-1 | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC71309 | . | 0.00165 | (0.00004) | . | . | . | . | . | 0.43 | 0.11 | . |
| CAN RTS-3a | (0.04) | 0.000921 | 0.0143 | 0.460 | 0.1585 | 0.684 | 0.00613 | 0.0446 | 0.000283 | . | 0.351 |

continued analysis listed in mg/kg

| Number | Ag | As | Au | Ba | Bi | Cr | Ga | Ge | In | Pd | Pt | Se | Sr | Te | Tl | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC71307 | 0.59 | (14.4) | . | . | 2.9 | . | 0.44 | (0.2) | . | . | . | 5.8 | . | 0.95 | . | . |
| NCS DC71308 | 846 | (3.1) | . | . | 16.1 | . | (0.3) | . | (66.6) | . | . | 48.3 | . | 10.4 | . | . |
| CAN HCC-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC71310 | 5.0 | (3.3) | . | . | 6.1 | . | 251 | 6.0 | 21.0 | . | . | (3.0) | . | (0.3) | . | . |
| CAN WMS-1A | (3.7) | 30.9 | 0.300 | (70) | (1.2) | (68) | (4) | . | (0.2) | 1.45 | 1.91 | (87) | (31.3) | . | . | (20) |
| CAN INM-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| NCS DC71309 | 0.97% | 5.3 | . | . | 1.4 | . | (0.3) | 1.47 | 0.29 | . | . | . | . | (0.07) | 0.65 | . |
| CAN RTS-3a | 11.1 | 18.2 | 0.561 | 106 | 31.3 | 176 | (30) | . | (1.6) | (0.004) | . | 44.8 | 44.7 | (2.0) | (3) | 78 |

## CRM SULPHUR ORE

analysis listed in mass %

| Number | $Al_2O_3$ | BaO | CaO | Cu | T.Fe | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | Zn | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS MII | 10.63 | 0.049 | 0.49 | 0.21 | 6.79 | 2.22 | 2.06 | 0.11 | 0.93 | (12) | (7) | (16) | 0.50 | 1.79 | (10) | 100 g |

continued analysis listed in mg/kg

| Number | Ag | As | B | Cd | Co | Cr | Cs | Eu | Ga | Hf | La | Mo | Ni |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS MII | (0.012) | 0.0901 | (0.005) | 0.0767 | 0.0223 | (0.012) | (0.003) | (0.003) | (0.008) | (0.003) | (0.003) | (0.003) | 0.0329 |

| Number | Pb | Rb | Sb | Sc | Sr | Ta | Th | U | V | W | Y | Yb | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNS MII | 0.868 | (0.005) | (0.004) | (0.003) | 0.0259 | (0.003) | (0.006) | (0.004) | 0.0845 | (0.004) | (0.008) | (0.006) | (0.008) |

## CRM SULPHUR ORE

| Number | S% | C% |
|---|---|---|
| GS908-4 | 30.08 | . |
| GS399-10 | 28.22 | . |
| GS310-2 | 27.59 | . |
| GS900-2 | 26.62 | . |
| GS300-5 | 26.54 | . |
| GS310-1 | 26.44 | . |
| GS316-8 | 25.59 | 0.07 |
| GS300-7 | 24.85 | . |
| GS916-8 | 23.76 | 0.60 |
| GS322-8 | 22.27 | 0.51 |
| GS907-10 | 21.94 | . |
| GS916-6 | 19.20 | 0.48 |
| GS317-2 | 18.66 | 0.48 |
| GS316-7 | 18.13 | 0.41 |
| GS916-7 | 17.67 | 0.52 |
| GS317-3 | 16.76 | 0.67 |
| GS916-9 | 14.55 | 0.60 |
| GS913-3 | 10.95 | 0.03 |
| GS312-7 | 10.53 | 2.63 |
| GS916-4 | 9.95 | 0.86 |
| GS312-6 | 9.80 | 3.10 |
| GS910-4 | 8.27 | . |
| GS921-9 | 8.04 | 3.18 |
| GS913-1 | 7.90 | 0.06 |
| GS314-8 | 7.82 | 0.26 |
| GS907-4 | 7.68 | . |
| GS917-1 | 7.33 | 0.47 |
| GS913-5 | 7.30 | 0.03 |
| GS913-6 | 7.22 | 0.04 |
| GS913-7 | 7.18 | 0.04 |
| GS307-7 | 7.04 | . |
| GS921-8 | 6.90 | 0.14 |
| GS901-2 | 6.59 | 0.30 |
| GS913-8 | 6.56 | 0.04 |
| GS314-10 | 6.50 | 0.37 |
| GS914-6 | 6.35 | 1.18 |
| GS921-10 | 6.13 | 0.28 |
| GS905-3 | 5.64 | . |
| GS914-4 | 5.44 | 1.00 |
| GS908-6 | 5.01 | . |
| GS311-7 | 4.41 | 0.50 |
| GS905-8 | 4.38 | . |
| GS921-7 | 4.08 | 0.09 |
| GS314-3 | 3.37 | 0.36 |
| GS310-3 | 3.3 | . |
| GS901-1 | 3.20 | . |
| GS399-7 | 3.09 | . |
| GS917-2 | 3.09 | 0.40 |
| GS314-2 | 2.56 | 5.15 |
| GS302-7 | 2.39 | . |
| GS311-1 | 2.35 | . |
| GS399-5 | 2.29 | . |
| GS305-1 | 2.20 | . |
| GS310-5 | 2.2 | . |
| GS916-3 | 2.17 | 0.26 |
| GS915-1 | 2.06 | 0.08 |
| GS916-5 | 2.05 | 0.07 |
| Number | S% | C% |

## CRM SULPHUR ORE

| Number | S% | C% |
|---|---|---|
| GS302-5 | 1.98 | . |
| GS302-9 | 1.94 | . |
| GS305-6 | 1.71 | . |
| GS921-3 | 1.66 | 1.93 |
| GS300-4 | 1.43 | . |
| GS305-7 | 1.41 | . |
| GS313-8 | 1.24 | 0.94 |
| GS310-4 | 1.17 | . |
| GS311-3 | 1.12 | . |
| GS322-7 | 1.10 | 2.71 |
| GS914-5 | 1.08 | 1.39 |
| GS915-7 | 1.07 | 0.16 |
| GS315-9 | 0.94 | 0.34 |
| GS900-3 | 0.92 | . |
| GS910-3 | 0.92 | . |
| GS910-7 | 0.86 | . |
| GS313-7 | 0.78 | 0.74 |
| GS907-3 | 0.78 | . |
| GS305-2 | 0.76 | . |
| GS900-4 | 0.71 | . |
| GS921-5 | 0.70 | 0.99 |
| GS921-6 | 0.70 | 0.97 |
| GS322-3 | 0.69 | 0.57 |
| GS322-2 | 0.68 | 1.46 |
| GS314-9 | 0.64 | 1.13 |
| GS903-1 | 0.63 | . |
| GS910-9 | 0.63 | . |
| GS322-6 | 0.61 | 0.03 |
| GS316-4 | 0.58 | 0.09 |
| GS316-2 | 0.56 | 0.08 |
| GS916-2 | 0.56 | 0.17 |
| GS311-4 | 0.54 | . |
| GS917-5 | 0.53 | 0.30 |
| GS322-5 | 0.52 | 0.05 |
| GS322-5 | 0.52 | 0.05 |
| GS912-3 | 0.52 | 0.07 |
| GS312-3 | 0.47 | 0.06 |
| GS301-6 | 0.40 | . |
| GS300-8 | 0.37 | . |
| GS316-1 | 0.36 | 0.04 |
| GS917-4 | 0.36 | 0.05 |
| GS921-4 | 0.36 | 1.93 |
| GS316-3 | 0.34 | 0.06 |
| GS303-9 | 0.31 | . |
| GS312-5 | 0.28 | 0.88 |
| GS312-5 | 0.28 | 0.88 |
| GS303-10 | 0.27 | . |
| GS310-10 | 0.27 | . |
| GS914-2 | 0.26 | 0.06 |
| GS315-8 | 0.25 | 0.19 |
| GS322-4 | 0.24 | 1.35 |
| GS914-10 | 0.24 | 0.21 |
| GS921-1 | 0.23 | 0.14 |
| GS921-2 | 0.23 | 0.18 |
| GS312-9 | 0.21 | 0.03 |
| GS317-1 | 0.21 | 0.15 |
| GS322-1 | 0.21 | 0.18 |
| GS906-6 | 0.21 | . |
| GS915-3 | 0.19 | 0.11 |
| GS914-1 | 0.18 | 0.04 |
| GS915-8 | 0.13 | 0.07 |
| GS917-8 | 0.11 | 5.78 |
| Number | S% | C% |

## CRM SULPHUR ORE

| Number | S% | C% |
|---|---|---|
| GS912-1 | 0.09 | 0.03 |
| GS915-6 | 0.09 | 0.04 |
| GS917-9 | 0.09 | 5.56 |
| GS316-10 | 0.08 | 0.03 |
| GS316-9 | 0.08 | 0.06 |
| GS311-5 | 0.07 | . |
| GS307-2 | 0.06 | . |
| GS912-2 | 0.06 | 0.03 |
| GS313-1 | 0.05 | 0.03 |
| GS316-5 | 0.05 | 0.46 |
| GS316-6 | 0.05 | 0.45 |
| GS317-6 | 0.05 | 0.05 |
| GS910-5 | 0.05 | . |
| GS911-5 | 0.05 | . |
| GS911-9 | 0.05 | . |
| GS912-10 | 0.05 | 0.11 |
| GS912-6 | 0.05 | 0.06 |
| GS915-4 | 0.05 | 0.03 |
| GS312-10 | 0.04 | 0.03 |
| GS312-2 | 0.04 | 0.22 |
| GS314-7 | 0.04 | 0.09 |
| GS315-4 | 0.04 | 0.11 |
| GS317-10 | 0.04 | 0.04 |
| GS910-2 | 0.04 | . |
| GS912-9 | 0.04 | 0.12 |
| GS917-3 | 0.04 | 0.05 |
| GS313-2 | 0.03 | 0.03 |
| GS313-4 | 0.03 | 0.26 |
| GS313-5 | 0.03 | 0.25 |
| Number | S% | C% |

for all GS Sulfur Ore samples, unit size is 10 g powder

## CRM SYENITE WITH EXTENSIVE ANALYSIS

analysis listed in mass % * Provisional Analysis 87Sr/86Sr ratio: 0.70375 GBW, US: 50 g all others: 100 g units

| Number | $SiO_2$ | $Al_2O_3$ | $CO_2$ | CaO | Cl | F | FeO | $Fe_2O_3$ | T.$Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SARM 2~~ | ~~63.63~~ | ~~17.34~~ | ~~0.27~~ | ~~0.68~~ | ~~.~~ | ~~CO2:0.09~~ | ~~0.30~~ | ~~1.11~~ | ~~1.40~~ | ~~+0.22~~ | ~~15.35~~ | ~~0.46~~ | ~~BaO:0.27~~ | ~~0.43~~ | ~~0.27~~ | ~~.~~ | ~~(0.04)~~ | ~~.~~ |
| ~~US STM-2 *~~ | ~~60.98~~ | ~~18.4~~ | ~~.~~ | ~~1.09~~ | ~~(0.0570)~~ | ~~.~~ | ~~(2.08)~~ | ~~.~~ | ~~5.39~~ | ~~T.Fe:3.77~~ | ~~4.07~~ | ~~0.12~~ | ~~Mn:0.1640~~ | ~~8.90~~ | ~~0.17~~ | ~~.~~ | ~~0.16~~ | ~~.~~ |
| JSy-1 | 60.02 | 23.17 | . | 0.25 | . | . | . | . | 0.084 | . | 4.82 | 0.016 | 0.0024 | 10.74 | . | . | . | . |
| VS 6104-91 | 57.86 | 16.68 | (0.20) | 6.94 | . | 0.082 | 2.51 | . | 5.41 | (-0.05, +0.28) | 4.77 | 1.25 | 0.14 | 4.51 | 0.39 | (0.017) | 0.78 | (0.38) |
| GBW 07109 | 54.48 | 17.72 | 0.26 | 1.39 | 0.059 | 0.048 | 1.23 | 6.04 | . | 2.38 | 7.48 | 0.65 | 0.12 | 7.16 | 0.018 | 0.011 | 0.48 | . |
| CGL 015 | 52.20 | 24.59 | . | 1.98 | . | (0.10) | 2.60 | . | 4.67 | (-0.104, +0.58) | 4.44 | 0.37 | (0.100) | 9.76 | 0.139 | . | 0.37 | 1.05 |
| CAN SY-5 | 49.83 | 14.35 | C:0.171 | 7.039 | . | . | . | 10.61 | . | 0.142 | 4.170 | 3.13 | 0.1283 | 4.15 | 2.04 | 0.421 | 1.777 | 0.86 |

continued analysis listed in mg/kg except % which is mass %

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Ge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SARM 2~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~11.9~~ | ~~(3)~~ | ~~12~~ | ~~.~~ | ~~19~~ | ~~(0.4)~~ | ~~.~~ | ~~0.30~~ | ~~11~~ | ~~.~~ | ~~.~~ |
| ~~US STM-2 *~~ | ~~(1.2)~~ | ~~.~~ | ~~(5.4)~~ | ~~639~~ | ~~9.7~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~256~~ | ~~.~~ | ~~.~~ | ~~1.52~~ | ~~.~~ | ~~(8.01)~~ | ~~(4.4)~~ | ~~3.45~~ | ~~34~~ | ~~(8)~~ | ~~.~~ |
| JSy-1 | . | . | . | 15.7 | . | . | . | . | 2.6 | . | 2.0 | 0.69 | 1.3 | 0.37 | 0.30 | 0.16 | 23.5 | 7.0 | 0.95 |
| VS 6104-91 | (0.03) | (12) | (7) | 0.69% | 1.9 | | | | 219 | 8 | 16 | (1) | 5 | (6.9) | (2.5) | 4.5 | 17 | (10) | (1.2) |
| GBW 07109 | . | 6.27 | 31.8 | 251 | 17.2 | 0.37 | 1.21 | 0.07 | 242 | 4.59 | 3.6 | 2.05 | 11.8 | 4.70 | 2.48 | 2.35 | 35.8 | . | . |
| CGL 015 | . | . | . | 1305 | (1.86) | . | . | . | 58.24 | (5.33) | 25.6 | (1.31) | 6.40 | (4.49) | (2.69) | (1.36) | 22.63 | (4.75) | . |
| CAN SY-5 | . | . | . | 6480 | 4.62 | . | . | . | 459 | 23.1 | 151.5 | 0.612 | 37.9 | 11.33 | 5.38 | 7.64 | 21.6 | 19.8 | . |

| Number | Hf | Hg | Ho | I | In | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Sb | Sc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SARM 2~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~(5)~~ | ~~.~~ | ~~.~~ | ~~Mn:80~~ | ~~.~~ | ~~(6)~~ | ~~(7)~~ | ~~(5)~~ | ~~.~~ | ~~530~~ | ~~.~~ | ~~.~~ |
| ~~US STM-2 *~~ | ~~27~~ | ~~.~~ | ~~(1.55)~~ | ~~.~~ | ~~.~~ | ~~154~~ | ~~36~~ | ~~0.60~~ | ~~6.2~~ | ~~267~~ | ~~81~~ | ~~(4.8)~~ | ~~12~~ | ~~25~~ | ~~114~~ | ~~.~~ | ~~.~~ |
| JSy-1 | 1.2 | . | 0.094 | . | . | 1.2 | . | 0.076 | . | 0.51 | 1.2 | 1.1 | 4.9 | 0.32 | 66.3 | 0.15 | . |
| VS 6104-91 | 5 | . | (1) | . | . | 108 | 10.5 | 0.33 | 1.1 | 20 | 102 | 8.4 | 21 | (23) | 56 | . | 4 |
| GBW 07109 | 34.0 | 0.005 | 0.96 | 0.14 | 0.15 | 149 | 32.9 | 0.43 | 0.26 | 66.9 | 65.1 | 1.75 | 196 | 22.5 | 130 | 0.15 | 2.22 |
| CGL 015 | (3.15) | . | (0.93) | . | . | 27.48 | 64.95 | (0.42) | (1.51) | 22.63 | 27.34 | (3.4) | 7.00 | (6.99) | 85.36 | (0.14) | 2.76 |
| CAN SY-5 | 15.3 | . | 2.04 | . | . | 225 | 49.5 | 0.702 | 8.893 | 22.2 | 208.1 | 79.8 | 65.9 | 55.3 | 76.9 | 0.524 | 12.37 |

| Number | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~SARM 2~~ | ~~.~~ | ~~(1)~~ | ~~.~~ | ~~62~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~1.0~~ | ~~Ti:265~~ | ~~.~~ | ~~.~~ | ~~10~~ | ~~.~~ | ~~.~~ | ~~(0.07)~~ | ~~(10)~~ | ~~(33)~~ |
| ~~US STM-2 *~~ | ~~.~~ | ~~12.0~~ | ~~(6.6)~~ | ~~782~~ | ~~16~~ | ~~(1.38)~~ | ~~.~~ | ~~27~~ | ~~.~~ | ~~0.55~~ | ~~(7.6)~~ | ~~(5.5)~~ | ~~(2.2)~~ | ~~43~~ | ~~4.2~~ | ~~223~~ | ~~1280~~ |
| JSy-1 | . | 0.27 | 0.17 | 19.3 | . | . | . | 0.23 | . | 0.053 | 0.20 | 2.1 | . | 2.6 | 0.41 | 3.2 | 70.2 |
| VS 6104-91 | . | 16 | (1.9) | 0.52% | (1.8) | (1.7) | . | (12) | . | (0.45) | (2) | 79 | . | 25 | 2.3 | 109 | 185 |
| GBW 07109 | 0.05 | 9.7 | 6.50 | 1160 | 1.96 | 1.02 | 0.012 | 79.3 | 0.76 | 0.46 | 14.6 | 179 | 1.24 | 24.7 | 2.56 | 112 | 1540 |
| CGL 015 | | (5.09) | . | 312 | (1.21) | (0.76) | . | (4.63) | (0.32) | (0.4) | (1.59) | (5.8) | (4.36) | 25.32 | 2.66 | 75.42 | 157 |
| CAN SY-5 | . | 31.1 | 2.56 | 3100 | 1.06 | 2.26 | . | 25.2 | 0.614 | 0.725 | 5.09 | 131.8 | . | 56.3 | 4.64 | 130.9 | 769 |

## NEPHELINE SYENITE

# = class, where 1 = CRM and 2 = RM analysis listed in mass % GBW: 50 g units all others: 100 g units

| # | Number | $SiO_2$ | $Al_2O_3$ | Ba | $CO_2$ | CaO | FeO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | Sr | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GBW 03124 | 60.64 | 20.05 | . | . | 0.52 | 0.28 | 1.37 | 2.34+ | 5.06 | 0.13 | 0.050 | 8.97 | 0.020 | (0.011) | . | 0.12 | 2.37 |
| 2 | BCS 201a | 57.3 | 23.54 | . | . | 1.07 | . | 0.12 | . | 8.90 | 0.025 | . | 7.53 | 0.025 | . | . | 0.05 | 0.76 |
| 1 | USZ 45-2007 | 51.88 | 22.58 | 0.0447 | (1.16) | 2.28 | 0.80 | 2.63 | . | 9.10 | 0.24 | 0.14 | 6.78 | 0.04 | . | 0.01740 | 0.37 | 3.35 |
| ~~1~~ | ~~VS 728-75~~ | ~~40.18~~ | ~~28.5~~ | ~~.~~ | ~~1.6~~ | ~~7.13~~ | ~~(1.43)~~ | ~~3.25T~~ | ~~(1.9+)~~ | ~~(3.3)~~ | ~~1.01~~ | ~~(0.04)~~ | ~~12.2~~ | ~~0.51~~ | ~~0.084~~ | ~~.~~ | ~~0.24~~ | ~~.~~ |
| 1 | GBW 03125 | 39.42 | 29.67 | . | 2.97 | 5.98 | 1.24 | 0.33 | 1.78+ | 4.72 | 0.92 | 0.031 | 12.59 | 0.072 | (0.064) | . | 0.14 | . |

continued analysis in mg/kg except % which is mass %

| Numeber | As | Ce | Cr | Cu | F% | Ga | La% | Li | Nb% | Pb | Rb% | Th | U | V | Y | Zn% | Zr% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03124 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| BCS 201a | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 45-2007 | 23.8 | 30.8 | 44 | (2.6) | (0.26) | 23 | 0.0163 | 54 | 0.0040 | 114 | 0.0207 | 61.6 | 12.4 | 30 | 23 | 0.0098 | 0.0600 |
| ~~VS 728-75~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~$Fe_2O_3$:(1.66%)~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~InsRes:(3.5%~~ |
| GBW 03125 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

## TALC

# = class, where 1 = CRM and 2 = RM  analysis listed in mass %  T = total  BCS: 100 g  JCRM, NCS: 50 g units

| # | Number | $Al_2O_3$ | $CO_2$ | CaO | $Fe_2O_3$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Ins.Res. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| available individually | | | | | | | | | | | | | | | |
| 1 | NCS DC60132 | 7.62 | 2.17 | 2.39 | 2.64T | 7.34 | 0.026 | 29.50 | 0.021 | 0.049 | 0.11 | 47.71 | 0.52 | 9.40 | (83.13) |
| 2 | BCS 203a | 0.30 | . | 0.25 | 0.22 | . | <0.01 | 32.08 | . | 0.02 | 0.13 | 59.7 | <0.01 | 6.78 | . |
| 1 | NCS DC60131 | 0.082 | 0.34 | 0.38 | 0.29T | 4.73 | 0.009 | 31.89 | 0.0015 | 0.022 | 0.14 | 62.03 | 0.0052 | 5.14 | (92.78) |
| sold in set/3 only, as grouped | | | | | | | | | | | | | | | |
| 1 | JCRM R903 | 2.447 | . | 0.998 | 0.564 | . | 0.007 | 31.84 | (0.003) | 0.029 | 0.051 | 55.76 | 0.075 | 8.23 | . |
| 1 | JCRM R901 | 0.924 | . | 0.438 | 0.1224 | . | 0.004 | 31.22 | 0.004 | 0.054 | 0.195 | 59.77 | 0.019 | 6.14 | . |
| 1 | JCRM R902 | 0.115 | . | 0.342 | 0.091 | . | 0.003 | 31.97 | (0.002) | 0.006 | 0.046 | 60.77 | 0.004 | 6.64 | . |

## CRM TANTALUM ORE

analysis listed in mass %

| Number | $Ta_2O_5$ | Ta | Al | $Al_2O_3$ | BeO | Ca | CaO | $Cs_2O$ | F | Fe | FeO | $Fe_2O_3$(T) | $H_2O+$ | K | $K_2O$ | $Li_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86315 | 1.02 | . | . | 14.58 | 0.00125 | . | 0.71 | 0.000814 | 0.019(F-) | . | 0.26 | 0.68 | 0.56 | . | 4.11 | 0.0106 |
| CAN TAN-1 | 0.288 | 0.2365 | (8.2) | . | . | (0.5) | . | . | . | (0.2) | . | . | . | (1.5) | . | . |
| NCS DC86305 | 0.00886 | . | . | 14.28 | 0.033 | . | 0.107 | 0.064 | 1.32 | . | (0.019) | 0.324 | 1.52 | . | 2.04 | 0.790 |

continued  analysis listed in mass %

| Number | Mg | MgO | Mn | MnO | Na | $Na_2O$ | $Nb_2O_5$ | $P_2O_5$ | $Rb_2O$ | Si | $SiO_2$ | Sn | $TiO_2$ | W | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86315 | . | 0.093 | . | 0.45 | . | 4.40 | 0.52 | (0.040) | 0.0244 | . | 72.34 | (0.000265) | 0.039 | 0.00214 | 0.61 |
| CAN TAN-1 | (0.02) | . | (0.02) | . | (4.6) | . | . | . | . | (33.4) | . | (0.01) | . | . | . |
| NCS DC86305 | . | 0.050 | . | 0.115 | . | 3.62 | 0.00423 | 0.347 | 0.244 | . | 75.06 | (0.0052) | 0.027 | 0.00164 | 2.21 |

continued  analysis listed in mg/kg

| Number | $CeO_2$ | $Dy_2O_3$ | $Er_2O_3$ | $Eu_2O_3$ | $Gd_2O_3$ | $Ho_2O_3$ | $La_2O_3$ | $Lu_2O_3$ | $Nd_2O_3$ | $Pr_6O_{11}$ | $RE_xO_y$* | $Sc_2O_3$ | $Sm_2O_3$ | $Tb_2O_3$ | $Tb_4O_7$ | $Tm_2O_3$ | $Y_2O_3$ | $Yb_2O_3$ | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86315 | 16.5 | 4.72 | 2.65 | 0.13 | 3.47 | 0.88 | 7.65 | 0.37 | 7.84 | 1.91 | 81.0 | 2.14 | 2.48 | . | 0.72 | 0.38 | 29.9 | 2.37 | 50 g |
| CAN TAN-1 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 200 g |
| NCS DC86305 | 3.6 | 0.65 | 0.27 | 0.16 | 1.2 | 0.22 | 3.3 | 0.028 | 3.4 | 0.86 | 18.6 | 0.64 | 0.77 | 0.14 | . | 0.040 | 3.7 | 0.24 | 50 g |

* $RE_xO_y$: Rare Earth Oxide

## CRM TIN AND TIN-TUNGSTEN ORE

| Number | Sn | As | Bi | Ca | Cu | F | Fe | MgO | Ni | Pb | S | Sb | Si | $SiO_2$ | Ti | W | Zn | Units | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC35002 | 62.49 | 0.306 | 0.020 | . | 0.043 | . | 9.53 | . | . | 1.62 | 0.090 | 0.016 | . | 0.930 | . | $WO_3$:0.182 | 0.120 | 100 g | |
| NCS DC35014 | 54.86 | 0.414 | 0.028 | . | 0.067 | . | 14.77 | (0.13) | . | 2.20 | . | 0.019 | . | (1.10) | . | . | 0.196 | 100 g | CaO: (0.11) |
| NCS DC35001 | 45.80 | 0.574 | 0.034 | . | . | . | 21.33 | . | . | 2.89 | 0.183 | 0.024 | . | . | . | . | 0.264 | 100 g | Ag: 0.00255 |
| ~~BCS 355~~ | ~~31.42~~ | ~~0.14~~ | ~~0.015~~ | ~~2.63~~ | ~~0.085~~ | ~~2.02~~ | ~~17.08~~ | ~~.~~ | ~~0.0040~~ | ~~0.012~~ | ~~0.50~~ | ~~.~~ | ~~7.14~~ | ~~.~~ | ~~0.37~~ | ~~0.35~~ | ~~0.059~~ | ~~100 g~~ | ~~Al: 4.12~~ |
| NCS DC35012 | 3.98 | 0.097 | . | . | 0.109 | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |
| NCS DC35011 | 0.737 | 0.046 | . | . | 0.077 | . | . | . | . | . | . | . | . | . | . | . | . | 70 g | |

## TITANIUM ORE

analysis listed in mass % T = TOTAL 35 g units

| Number | $Al_2O_3$ | CaO | $T.Fe_2O_3$ | FeO | $H_2O$ | $K_2O$ | MgO | Mn | $Na_2O$ | P | S | $SiO_2$ | $TiO_2$ | Zn | Zr | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73523 | 14.8 | 3.3 | 12.6 | 0.62 | (3.1) | 3.4 | 4.6 | 0.0700 | 1.4 | 0.25 | 0.0062 | 51.9 | 3.1 | 0.0111 | 0.0340 | (3.8) |
| NCS DC73524 | 15.3 | 3.2 | 10.9 | 0.52 | (3) | 2.9 | 3.6 | 0.0759 | 2.4 | 0.26 | 0.0055 | 51.0 | 6.3 | 0.0092 | 0.0701 | (3.4) |
| NCS DC73525 | 9.2 | 6.5 | 29.8 | 15.0 | (1.8) | 0.46 | 5.4 | 0.44 | 1.5 | 0.10 | 0.28 | 29.3 | 16.7 | 0.0193 | 0.0158 | 2.1 |
| NCS DC73526 | 0.94 | 0.32 | 48.1 | 22.5 | 0.8 | 0.030 | 0.57 | 1.1 | 0.08 | 0.0225 | 0.0185 | 2.1 | 48.1 | 0.0294 | 0.0414 | (0.7) |

Powder 35 g

continued analysis listed in mg/kg

| Number | As | Cd | Ce | Co | Cr | Cu | Dy | Er | Eu | Ga | Gd | Ho | La | Lu | Nb | Nd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73523 | 1.8 | 0.06 | 103 | 37 | 474 | 46 | 6.5 | 3.1 | 3 | 22 | 8.9 | 1.2 | 53 | 0.3 | . | 55 |
| NCS DC73524 | 2 | 0.07 | 107 | 26 | 286 | 31 | 6.7 | 3.3 | 3 | 21 | 9.1 | 1.3 | 54 | 0.35 | . | 55 |
| NCS DC73525 | (2) | 0.09 | 59 | 70 | 202 | 35 | 3.8 | 2.1 | 1.1 | 17 | 4.9 | 0.74 | 29 | 0.31 | 195 | 28 |
| NCS DC73526 | . | (0.005) | 143 | 50 | 397 | 18 | 7 | 4.1 | 0.6 | 11 | 10 | 1.3 | 68 | 0.6 | (707) | 62 |

| Number | Ni | Pb | Pr | Rb | Sc | Sm | Sr | Ta | Tb | Th | Tm | U | V | W | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73523 | 182 | 5.9 | 13 | 57 | 28 | 10 | 237 | (3.4) | 1.3 | 6 | 0.45 | 0.7 | 202 | (0.6) | 31 | 2.4 |
| NCS DC73524 | 104 | 6.7 | 14 | 48 | 24 | 10 | 298 | (8.7) | 1.3 | 7.6 | 0.5 | (2.2) | 264 | . | 32 | 2.7 |
| NCS DC73525 | 51 | 32 | 7 | 18 | 36 | 5.3 | 412 | (14) | 0.7 | 30 | 0.35 | 1.8 | 690 | (2.5) | 20 | 2.1 |
| NCS DC73526 | 15 | 104 | 16 | 1.5 | 50 | 11 | 21 | (40) | 1.3 | 99 | 0.6 | 4.7 | 723 | (8) | 37 | 4 |

## TITANIUM ORE

analysis listed in mass %

| # | Number | Ilmenite | $TiO_2$ | $Al_2O_3$ | C | CaO | Co | Cr | $Cr_2O_3$ | Fe | FeO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | OSO Ki-370-99 | 95.41 | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| 1 | NCS HC26619 | . | 98.21 | 0.65 | 0.011 | . | . | . | . | . | . | 0.006 | . | . | . | . |
| 1 | DSZU 123.22-95 | . | 65.33 | 3.17 | . | 0.51 | . | . | 1.32 | 16.10 | . | . | . | 0.53 | 0.92 | . |
| ~~1~~ | ~~DSZU 123.21-95~~ | ~~.~~ | ~~59.48~~ | ~~1.02~~ | ~~.~~ | ~~0.40~~ | ~~.~~ | ~~.~~ | ~~0.15~~ | ~~26.76~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.38~~ | ~~0.51~~ | ~~.~~ |
| 1 | VS R31 | . | 56.5 | 1.99 | . | . | . | . | 2.59 | 24.4 | . | . | . | . | . | . |
| 1 | NCS DC28139 | . | 55.68 | 2.30 | . | 0.070 | 0.0026 | . | 2.80 | 22.04 | 9.15 | . | . | 1.09 | 1.26 | . |
| 1 | DSZU 103.39-07 | . | 53.9 | 0.66 | . | . | . | . | 0.04 | 29.1 | . | . | . | 0.56 | 0.63 | . |
| 1 | NCS DC26705 | . | 51.35 | 0.75 | 0.043 | 0.16 | . | . | (0.07) | 31.40 | 23.81 | . | . | 0.84 | 0.90 | . |
| 1 | NCS DC28142 | . | 50.06 | 1.30 | . | 0.68 | 0.011 | . | 0.84 | 30.23 | 28.85 | . | . | 1.52 | 0.875 | . |
| 1 | NCS DC19019 | . | 49.78 | 0.53 | . | 0.028 | . | . | 0.054 | 34.56 | 25.05 | . | . | 0.32 | 1.55 | . |
| 1 | SARM 165 | . | 49.3 | 0.26 | . | 0.043 | . | . | 0.10 | . | 50.4 | . | . | 0.58 | 1.11 | . |
| 1 | NCS DC28138 | . | 47.82 | 0.68 | . | 0.68 | 0.0087 | . | 0.014 | 34.79 | 39.14 | . | . | 2.11 | 0.652 | . |
| 1 | NCS DC28140 | . | 45.73 | 0.95 | . | 2.23 | 0.051 | . | 0.012 | 33.02 | 36.68 | . | . | 1.68 | 0.882 | . |
| 1 | NCS DC19017 | . | 45.71 | 1.64 | . | 1.75 | . | . | 0.014 | 29.12 | 32.56 | . | . | 5.18 | 0.709 | . |
| 1 | NCS DC28141 | . | 45.61 | 0.867 | . | 1.65 | 0.0098 | . | 0.0067 | 33.58 | 37.51 | . | . | 1.74 | 0.799 | . |
| 1 | AMIS 0454 * | Ti: 26.78 | 44.45 | 0.731 | . | 0.216 | . | (0.0713) | (0.114) | see below | | 52.53 | (0.045) | 0.74 | 1.19 | (0.03) |
| 1 | NCS DC28137 | . | 40.66 | 1.35 | . | 4.78 | 0.010 | . | 0.0064 | 30.31 | 33.33 | . | . | 1.30 | 1.20 | . |
| 1 | NCS DC28143 | . | 35.60 | 1.65 | . | 6.25 | 0.013 | . | 0.0077 | 29.29 | 29.34 | . | . | 1.55 | 1.02 | . |
| 1 | NCS DC19018 | . | 33.94 | 4.47 | . | 3.14 | . | . | 0.0085 | 27.30 | 29.70 | . | . | 6.88 | 0.524 | . |
| 1 | NCS DC28136 | . | 27.23 | 2.31 | . | 9.49 | 0.015 | . | 0.0078 | 26.50 | 23.62 | . | . | 2.34 | 0.802 | . |
| 1 | CGL 129 | 17025 | 14.88 | 9.79 | | 1.16 | 0.0209 | 0.3068 | . | 61.86 | . | 61.86T | 0.137 | 3.05 | 0.240 | (0.086) |
| 1 | NCS DC28134 | . | 7.11 | 8.67 | . | 12.39 | 0.0052 | . | 0.0084 | 14.85 | 12.45 | . | . | 6.33 | 0.216 | . |
| 1 | NCS DC28135 | . | 6.14 | 8.82 | . | 9.87 | 0.0079 | . | 0.0095 | 15.07 | 12.77 | . | . | 6.78 | 0.187 | . |

| Number | Ni | P | $P_2O_5$ | S | $SiO_2$ | Sr | V | $V_2O_5$ | Zn | Zr | LOI | Units | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OSO Ki-370-99 | . | . | . | . | . | . | . | . | . | . | . | 1 kg of ~3mm material | |
| NCS HC26619 | . | . | . | 0.006 | . | . | . | . | . | . | . | 20 g | |
| DSZU 123.22-95 | . | . | 0.15 | 0.0090 | 1.45 | . | . | 0.18 | . | . | . | 100 g | |
| ~~DSZU 123.21-95~~ | ~~.~~ | ~~.~~ | ~~0.24~~ | ~~0.96~~ | ~~3.00~~ | ~~.~~ | ~~.~~ | ~~0.26~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~100 g~~ | |
| VS R31 | . | . | 0.25 | . | 1.24 | . | . | . | . | . | . | 100 g | |
| NCS DC28139 | 0.0007 | 0.047 | . | 0.025 | 1.54 | . | . | 0.266 | 0.017 | . | Cu:0.0093 | 50 g | |
| DSZU 103.39-07 | . | . | 0.10 | 0.59 | 1.88 | . | . | 0.25 | . | . | . | 100 g | |
| NCS DC26705 | . | 0.045 | . | 0.004 | 1.98 | . | . | 0.22 | . | . | . | 40 g | |
| NCS DC28142 | 0.0021 | 0.048 | . | 0.172 | 2.04 | . | . | 0.700 | 0.017 | . | Cu:0.0073 | 50 g | |
| NCS DC19019 | . | 0.0048 | . | 0.010 | 0.578 | . | . | 0.137 | . | . | . | 100 g | |
| SARM 165 | $Nb_2O_5$:0.076 | . | 0.022 | . | 0.72 | . | . | 0.26 | . | $ZrO_2$:0.10 | . | 100 g | |
| NCS DC28138 | 0.0029 | 0.0076 | . | 0.184 | 2.65 | . | . | 0.095 | 0.016 | . | Cu:0.0056 | 50 g | |
| NCS DC28140 | 0.0051 | 0.048 | . | 0.74 | 4.85 | . | . | 0.203 | 0.016 | . | Cu:0.013 | 50 g | |
| NCS DC19017 | . | 0.117 | . | 0.0080 | 5.99 | . | . | 0.090 | . | . | . | 100 g | |
| NCS DC28141 | 0.0046 | 0.047 | . | 0.536 | 4.16 | . | . | 0.188 | 0.015 | . | Cu:0.011 | 50 g | |
| AMIS 0454 * | . | . | (0.030) | . | 2.23 | . | . | (0.24) | . | $ZrO_2$:(0.12) | Nb:(0.0576) | 100 g | Density: 4.63 |
| NCS DC28137 | 0.0084 | 0.117 | . | 1.52 | 9.21 | . | . | 0.068 | 0.014 | . | Cu:0.022 | 50 g | |
| NCS DC28143 | 0.011 | 0.476 | . | 2.76 | 10.41 | . | . | 0.505 | 0.016 | . | Cu:0.027 | 50 g | |
| NCS DC19018 | . | 0.558 | . | 0.028 | 11.73 | . | . | 0.101 | . | . | . | 100 g | |
| NCS DC28136 | 0.013 | 1.07 | . | 4.77 | 14.41 | . | . | 0.066 | 0.015 | . | Cu:0.038 | 50 g | |
| CGL 129 | 0.0306 | . | 0.022 | . | 7.77 | 0.0152 | 0.02818 | . | 0.0575 | 0.00354 | (-0.25) | 150 g | |
| NCS DC28134 | 0.0037 | 0.883 | . | 0.196 | 38.43 | . | . | 0.062 | 0.019 | . | Cu:0.0082 | 50 g | |
| NCS DC28135 | 0.0098 | 0.232 | . | 0.021 | 42.61 | . | . | 0.092 | 0.018 | . | Cu:0.016 | 50 g | |

* AMIS 0454 certifies Fe by XRF 36.50%, Titration 37.14%, and M/ICP 36.37%.

Special Note: more Titanium Powders are in our "Other Chips & Powders Catalog."

## RM ILMENITE

typical analysis listed in mass % 100 g

| Number | $TiO_2$ | $Al_2O_3$ | C | CaO | $Co_3O_4$ | $Cr_2O_3$ | CuO | Fe | $K_2O$ | MgO | Mn | NiO | $P_2O_3$ | S | $SiO_2$ | SrO | $V_2O_5$ | ZnO | $ZrO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH 6706 | 32.37 | 4.46 | 0.044 | 1.179 | 0.024 | 0.143 | 0.017 | 36.83 | 0.118 | 2.82 | 0.094 | 0.049 | 0.017 | 0.288 | 7.31 | 0.016 | 0.285 | 0.020 | 0.044 |

## CRM TUNGSTEN ORE

analysis listed in mass % except * which is mg/kg CAN: 200 g GW: 10 g IGS: 65 g NCS: 50 g all others: 100 g

| Number | W | $WO_3$ | Ag* | As | Be | Bi | Cu | Fe | Ge* | Mo | Nb | P | Pb | S | $SiO_2$ | Sn | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~VS 1710-79~~ | ~~.~~ | ~~71.96~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.146~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | |
| NCS DC35018 | . | 70.50 | . | 0.028 | . | Ca:4.93 | 0.019 | . | . | 0.011 | . | 0.038 | . | 0.72 | 1.94 | 0.020 | |
| SRM 2430 | . | 70.26 | . | 0.002 | . | 0.078 | . | . | . | 0.22 | . | 0.017 | . | 0.26 | . | . | |
| NCS DC35019 | . | 69.19 | . | 0.052 | . | Ca:1.94 | 0.038 | . | . | 0.010 | . | 0.021 | . | 0.21 | 1.70 | 0.13 | |
| NCS DC35021 | . | 69.13 | . | . | . | . | 0.065 | . | Mn:0.042 | 0.031 | . | 0.044 | . | 0.73 | . | . | |
| SRM 277 | . | 67.50 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| NCS DC35020 | . | 67.18 | . | 0.083 | . | Ca:1.62 | 0.044 | . | . | 0.012 | . | 0.024 | . | 0.25 | 1.98 | 0.14 | |
| NCS DC35022 | . | 66.02 | . | . | . | . | 0.0034 | . | Mn:0.029 | 0.073 | . | 0.0079 | . | 0.35 | . | . | |
| NCS DC35023 | . | 57.01 | . | . | . | . | 0.13 | . | Mn:0.12 | 0.012 | . | 0.091 | . | 1.24 | . | . | |
| CAN CT-1 | 1.04 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| CAN BH-1 | 0.422 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| KZ 7027-93 | 0.17 | . | . | . | . | 0.015 | . | . | . | 0.0093 | 0.0014 | . | . | . | . | . | Zr: 0.013 |
| GW-03 | 0.1744 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| GW-02 | 0.1231 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| KZ 7026-93 | 0.11 | 1.2 | . | . | 0.0022 | 0.018 | 0.052 | . | 3.6 | 0.00098 | 0.0015 | . | . | Sr:0.017 | . | . | Sr: 0.017 |
| CAN TLG-1 | 0.083 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| IGS 27 | 0.036 | . | . | . | . | . | . | 1.76 | . | 0.276 | . | . | . | . | . | . | |
| ~~VS 1714-79~~ | ~~.~~ | ~~1.04~~ | ~~10.3~~ | ~~.~~ | ~~.~~ | ~~0.089~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.041~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~.~~ | ~~0.113~~ | |
| VS 1715-79 | . | 0.60 | . | . | 0.013 | 0.054 | 0.020 | . | 3.1 | 0.026 | . | . | 0.049 | . | . | 0.068 | last Zn: 0.038 |
| VS 2040-81 | . | 0.49 | . | . | . | 0.0058 | 0.053 | 0.94 | . | 0.016 | . | . | . | . | . | . | last |
| VS 2042-81 | . | 0.38 | . | . | . | 0.0032 | 0.105 | 4.17 | . | 0.039 | . | . | . | . | . | . | last |
| VS 2039-81 | . | 0.22 | . | . | . | 0.023 | 0.27 | 2.47 | . | 0.0026 | . | . | . | . | . | . | last |
| VS 1713-79 | . | 0.17 | 5.5 | . | 0.0058 | 0.015 | . | . | 2.9 | 0.011 | . | . | . | . | . | 0.028 | last |
| VS 1711-79 | . | 0.036 | . | . | 0.0022 | 0.0044 | . | . | . | 0.0026 | . | . | . | . | . | 0.0071 | last |

## CRM TUNGSTEN ORE

analysis listed in mass % T = Total GBW: 50 g USZ: 100 g units

| Number | $WO_3$ | $Al_2O_3$ | As | Bi | CaO | Cy | F | FeO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | Mo | $Na_2O$ | Pb | Rb | S | $SiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 26-99 | 0.41 | 14.14 | 0.09 | 0.0067 | 1.95 | . | . | 3.72 | 5.59T | 4.32 | 2.04 | 0.12 | 0.079 | 2.13 | 0.0076 | 0.106 | . | 64.87 |
| GBW 07241 | . | 11.15 | . | 0.068 | 4.17 | 0.096 | 4.84 | . | 5.60 | 1.58 | 0.14 | 0.090 | 0.098 | 0.12 | . | (0.05) | 1.90 | 71.27 |
| GBW 07240 | . | 8.24 | 0.18 | 0.011 | 37.73 | 0.79 | 9.91 | . | 7.79 | 1.94 | 1.45 | 0.97 | . | 0.16 | 0.26 | (0.08) | 3.12 | 13.27 |

analysis listed in mass % analysis listed in mg/kg except % which is mass %

| Number | Sn | $TiO_2$ | Zn | Ag | As | Cd | Ce | Co | Cu% | Dy | Eu | Er | Ga | Gd | Ge | Ho | In | La |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 26-99 | (0.016) | 0.82 | 0.017 | . | . | . | . | 11 | 0.022 | . | . | . | . | . | . | . | . | . |
| GBW 07241 | 0.17 | 0.044 | 0.010 | 1.8 | 69.6 | 0.94 | 60.3 | . | . | 20.7 | 0.17 | 13.1 | 16.5 | 14.8 | 11.2 | 4.5 | 1.3 | 1.8 |
| GBW 07240 | 0.14 | 0.079 | 0.29 | 8.3 | . | 26.1 | 10.0 | . | . | 0.46 | 0.15 | 0.23 | 17.8 | 0.64 | 2.5 | 0.11 | 8.7 | 5.0 |

analysis listed in mg/kg except % which is mass %

| Number | Lu | Mo | Nd | Ni | Pb | Pr | Sb | Sc | Se | Sm | Sr | Tb | Te | Th | Tl | Tm | Y | V% | Yb | Zr% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USZ 26-99 | . | . | . | 35 | . | . | (20) | . | . | . | 78 | . | . | . | . | . | . | 0.010 | . | 0.017 |
| GBW 07241 | 2.4 | . | 32.9 | 2.8 | 81.2 | 7.9 | 3.1 | 5.4 | 0.96 | 12.5 | . | 3.3 | 2.9 | 28.3 | 1.8 | 2.2 | 128 | . | 14.9 | . |
| GBW 07240 | 0.06 | 4.2 | 4.0 | 4.1 | . | 1.1 | 5.1 | 1.8 | 0.39 | 0.79 | . | 0.15 | 0.66 | 2.2 | 5.0 | 0.04 | 2.8 | . | 0.28 | . |

## CRM TUNGSTEN ORE

analysis in mass % except * is mg/kg more information on certificates

| Number | W | $WO_3$ | Au* | Cu | Fe | FeO | $Fe_3O_4$ | Mo | $SiO_2$ | Sn | Mass Recovered | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OREAS 701 | 2.43 | 3.07 | 1.11 | 0.491 | 23.98 | 17.35 | 17.95 | 0.0254 | 33.95 | 0.0197 | 20.80 | 10g, 500g, or 1 kg, last of stock |
| ~~OREAS 700~~ | ~~1.13~~ | ~~1.42~~ | ~~0.506~~ | ~~0.202~~ | ~~16.06~~ | ~~12.07~~ | ~~10.91~~ | ~~0.0081~~ | ~~47.30~~ | ~~0.0182~~ | ~~11.28~~ | ~~10g~~ |

## RM ULTRAMAFIC ROCK - KOMATIITE

analysis listed in mass %

| Number | $Al_2O_3$ | CaO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OKUM | 7.97 | 7.85 | 11.81 | 0.044 | 21.2 | 0.188 | 1.13 | 0.026 | 44.1 | 0.380 | (4.49) |

continued analysis listed in mg/kg

| Number | Ba | Be | Ce | Co | Cr | Cs | Cu |
|---|---|---|---|---|---|---|---|
| IAG OKUM | (6.2) | (0.065) | 1.27 | 88 | 2460 | 0.184 | 43 |

continued analysis listed in mg/kg

| Number | Dy | Er | Eu | Ga | Gd | Hf | Ho | La | Li | Lu | Nb | Nd | Ni | Pb | Pr | Rb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OKUM | 1.61 | 1.04 | 0.300 | 8.7 | (1.17) | 0.55 | 0.355 | 0.41 | (4.4) | 0.148 | 0.37 | 1.49 | 88 | (0.26) | 0.235 | 0.96 |

| Number | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Th | Tm | U | V | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OKUM | (0.079) | 27 | 0.71 | (0.25) | 16 | 0.026 | (0.229) | 0.031 | (0.155) | (0.012) | 167 | 9.0 | 1.00 | 61 | 17 | 100 g |

## CRM URANIUM ORE

analysis listed in mass % CGL: 100g GU: 10 g

| Number | U | $Al_2O_3$ | CaO | Cu | Fe | $TFe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | Zn | Zr | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GU-10 | 0.1876 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-09 | 0.1134 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-08 | 0.03124 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-07 | 0.02429 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| CGL 503 | 0.0147 | 14.28 | 0.822 | 0.00148 | . | 3.18 | 3.88 | 0.779 | 0.044 | 1.99 | 0.160 | (0.20) | 67.95 | 0.649 | 0.00797 | 0.0239 | (4.95) |
| GU-11 | 0.003467 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-03 | 0.00048 | . | . | 0.00210 | 3.5 | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-04 | 0.00042 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-06 | 0.000382 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| GU-05 | 0.000356 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |

continued analysis for CGL 503 listed in mg/kg

| Number | As | Ba | Be | Cd | Ce | Co | Cr | Cs | Dy | Er | Eu | Ga | Gd | Ge | Hf | Ho | La | Li | Lu | Mo | Nb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 503 | (9.96) | 662 | (4.96) | (0.23) | 87.9 | 7.5 | 45.4 | 12.2 | (4.44) | (2.43) | (1.29) | 22.2 | (5.45) | (1.74) | (2.89) | (0.84) | 46.9 | (41.31) | (0.30) | 8.8 | 17.2 |

| Number | Nd | Ni | Pb | Pr | Rb | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Th | Ti | Tm | V | W | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 503 | (36.51) | 12.6 | 35.5 | (9.67) | 234 | (0.31) | 7.9 | (4.31) | (6.49) | (4.44) | 269 | (0.99) | (0.71) | 17.6 | (1.45) | (0.33) | 82.3 | (4.43) | 24.4 | (1.98) |

## CRM URTITE

analysis listed in mass 40 g units

| Number | $SiO_2$ | $TiO_2$ | $Al_2O_3$ | $Fe_2O_3$ | MnO | MgO | CaO | $Na_2O$ | $K_2O$ | FeO | $P_2O_5$ | Ba | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2123-81 | 42.80 | 1.79 | 26.47 | 2.67 | 0.084 | 0.14 | 3.73 | 13.33 | 5.16 | 1.40 | 0.388 | 0.035 | 0.100 |

continued analysis listed in mg/kg

| Number | Be | Co | Cr | Cu | Ga | La | Li | Mo | Nb | Ni | Pb | Rb | Sn | V | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VS 2123-81 | 5.1 | 8.1 | 9.7 | 24 | 48 | 100 | 8.9 | 2.3 | 97 | 6.5 | 5.8 | 79 | 3.4 | 86 | 26 | 1.7 | 44 | 220 |

## CRM VANADIUM ORE

analysis listed in mass % 10 g units

| Number | $V_2O_5$ | $Al_2O_3$ | CaO | $Cr_2O_3$ | Fe | $K_2O$ | MgO | MnO | $Na_2O$ | $SiO_2$ | $TiO_2$ | Co | Cu | Ni | P | S | Zn | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GV-01 | 1.233 | 5.57 | 0.079 | 0.721 | 48.95 | 0.010 | 1.30 | 0.148 | 0.015 | 4.27 | 14.104 | 0.019 | 0.022 | 0.067 | 0.005 | 0.067 | 0.037 | 2.07 |
| GV-02 | 0.790 | 11.24 | 2.484 | 0.560 | 34.41 | 0.080 | 2.80 | 0.161 | 0.573 | 19.76 | 9.174 | 0.017 | 0.033 | 0.061 | 0.018 | 0.220 | 0.030 | 2.76 |
| GV-06 | 0.343 | 7.18 | 6.204 | 0.007 | 25.93 | 0.464 | 9.73 | 0.326 | 0.627 | 30.57 | 6.549 | 0.014 | 0.007 | 0.016 | 0.102 | 0.018 | 0.027 | 0.91 |
| GV-03 | 0.327 | 16.78 | 2.966 | 0.044 | 20.24 | 0.183 | 3.59 | 0.176 | 0.843 | 33.96 | 4.302 | 0.013 | 0.013 | 0.048 | 0.023 | 0.073 | 0.016 | 7.44 |
| GV-05 | 0.223 | 7.53 | 4.004 | 0.008 | 23.97 | 0.440 | 14.33 | 0.350 | 1.272 | 34.61 | 4.121 | 0.017 | 0.006 | 0.022 | 0.099 | 0.013 | 0.024 | -1.28 |
| GV-04 | 0.089 | 11.93 | 8.822 | <0.01 | 13.15 | 1.809 | 4.21 | 0.263 | 3.008 | 45.99 | 3.568 | 0.005 | 0.013 | 0.004 | 0.348 | 0.086 | 0.020 | 0.47 |

## RM VOLCANIC TUFF WITH EXTENSIVE ANALYSIS

analysis listed in mass % ~35 g units

| Number | $Al_2O_3$ | Ba | CaO | FeO | $T.Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | Sr | $TiO_2$ | V | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-1 | 15.136 | 0.01314 | 6.488 | 4.995 | 8.987 | 0.215 | 4.727 | 0.129 | 2.463 | 0.050 | 58.247 | 0.010476 | 0.440 | 0.022223 | 3.058 |

continued analysis listed in mg/kg

| Number | As | Be | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Hf | Ho | La | Li |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-1 | 8.221 | 0.43 | 0.17 | 12.49 | 24.41 | 27.65 | 0.14 | 61.55 | 3.40 | 2.40 | 0.52 | 13.63 | 2.78 | 1.65 | 0.80 | 5.60 | 20.35 |

| Number | Lu | Nb | Nd | Ni | Rb | Sb | Sc | Sm | Ta | Tb | Th | Tm | U | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAG OU-1 | 0.39 | 2.3 | 7.32 | 13.00 | 2.05 | 0.22 | 32.69 | 2.13 | 0.15 | 0.49 | 1.68 | 0.37 | 0.40 | 21.63 | 2.49 | 74.40 | 55.00 |

## CRM WOLLASTONITE

analysis listed in mass % 50 g units

| Number | $Al_2O_3$ | CaO | FeO | $Fe_2O_3$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBW 03123 | 0.39 | 40.39 | 0.28 | 0.10 | 0.14 | 0.95 | 0.096 | 0.052 | 0.052 | (0.010) | 50.50 | 0.022 | 6.93 |

## CRM ZEOLITE WITH EXTENSIVE ANALYSIS

analysis listed in mass % T = Total

| Number | $Al_2O_3$ | Ba | CaO | $Fe_2O_3$ | $H_2O-$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Rb | $SiO_2$ | Sr | $TiO_2$ | Zr | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLX CRM104 | 33.74 | . | 0.063 | 0.014 | . | . | . | . | 20.06 | . | . | 45.98 | . | . | . | (22.64) | 35 g |
| USZ 49-2009 | 12.98 | 0.0371 | 1.34 | 1.27T | . | 3.19 | 0.573 | 0.033 | 3.44 | 0.032 | 0.0106 | 67.44 | 0.0635 | 0.158 | 0.0177 | 8.80 | 70 g |
| **CGL 017** | 12.91 | 0.0383 | 1.30 | 0.802T | (4.17) | 3.21 | (0.55) | 0.007 | 3.35 | 0.030 | 0.0107 | 67.64 | 0.0651 | 0.161 | (0.0179) | (9.77) | 70 g |
| NH Zeolite 1 | 12.21 | 0.0779 | 4.51 | 1.75T | . | 2.19 | 1.41 | 0.045 | 0.612 | 0.055 | 0.00957 | 67.11 | 0.0617 | 0.190 | 0.0158 | . | 50 g |

continued analysis listed in mg/kg

| Number | As | Be | Bi | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu | Ga | Gd | Hf | Hg | Ho |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLX CRM104 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 49-2009 | 60.5 | (2.75) | (11.7) | (7.85) | 74.8 | 20.3 | 12.7 | 4.73 | 79.3 | (3.46) | (1.83) | (0.50) | 13.8 | (3.81) | (5.38) | (1.85) | (0.66) |
| **CGL 017** | (63) | (2.6) | . | . | (77) | (0.94) | (7.9) | . | (2.9) | (3.5) | (1.91) | (0.49) | 14.84 | (4.3) | (7.9) | . | (0.67) |
| NH Zeolite 1 | 1.96 | 1.96 | . | . | 52.3 | . | . | 3.88 | 5.12 | . | . | . | 13.9 | . | . | 0.329 | . |

| Number | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Sb | Sc | Sm | Sn | Ta | Tb | Th | Tm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLX CRM104 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USZ 49-2009 | 37.2 | (6.07) | (0.27) | (0.43) | 14.1 | 27.3 | 14.6 | 84.2 | (7.97) | (50.9) | 3.27 | (4.82) | (2.27) | (1.16) | (5.9) | 17.2 | (0.27) |
| **CGL 017** | (39.5) | (6.4) | (0.28) | . | 14.17 | (27.5) | (2.2) | 21.78 | (8.4) | . | (3.6) | (5.1) | (2.6) | (1.26) | (0.63) | (17.3) | (0.29) |
| NH Zeolite 1 | 32.6 | . | . | . | . | . | . | 20.8 | . | 0.379 | . | . | . | . | . | . | . |

| Number | U | V | W | Y | Yb | Zn |
|---|---|---|---|---|---|---|
| FLX CRM104 | . | . | . | . | . | . |
| USZ 49-2009 | 3.09 | 42.3 | (1.52) | 18.6 | (1.81) | 79.3 |
| **CGL 017** | (3.1) | (11.1) | . | 20.36 | (1.8) | 25.37 |
| NH Zeolite 1 | . | 12.6 | . | 21.8 | . | 38.2 |

**17025**

## CRM ZINC ORE

analysis listed in mass % except * which is mg/kg T = Total

| Number | Zn | S | $Al_2O_3$ | Ca | CaO | Cd | Cu | Fe | Hg* | Mg | MgO | Ni | Pb | Sb | $SiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IMN TC/P10 | 60.6 | 3.07 | 0.14 | . | 2.54 | . | . | 6.7 | . | . | 1.38 | . | 2.31 | . | 0.56 |
| CAN CZN-4 | 55.24 | 33.07 | Al:0.0715 | (0.0419) | . | 0.2604 | 0.403 | (9) | 4.54 | (0.0352) | . | (0.0016) | 0.1861 | (0.0010) | Si:0.295 |
| BCS 520 | 52.50 | 31.78 | 0.334 | . | 0.125 | . | 0.568 | 9.88 | . | . | 0.266 | . | 0.820 | . | 1.78 |
| NCS DC35017 | 46.93 | . | . | . | 2.65 | 0.199 | . | 0.432 | . | . | 1.46 | . | 1.69 | . | 6.65 |
| NCS DC28169 | 43.46 | 26.70 | . | . | 2.05 | 0.309 | 0.265 | 6.79 | . | . | 0.158 | . | 2.66 | . | 5.95 |
| GBM305-12 | 17.0581 | . | . | . | . | . | 0.0119 | . | . | . | . | 0.0042 | 0.4214 | . | . |
| GBM919-13 | 6.5874 | 5.78 | . | . | . | . | 1.6692 | . | . | . | . | 0.0056 | 0.3986 | . | . |
| GBM916-11 | 6.0894 | 9.89 | . | . | . | . | 1.0864 | . | . | . | . | 0.0009 | 0.2843 | . | . |
| IMN RG 8 | 5.4 | 0.57 | 0.9 | . | 26.45 | 0.047 | . | 6.34 | . | . | 12.16 | . | 0.84 | . | 2.64 |
| GBM907-14 | 3.1882 | 2.90 | . | . | . | . | 0.8167 | . | . | . | . | 0.0061 | 0.1973 | . | . |
| IMN RB 7 | 3.07 | (10.3) | . | . | 24.35 | 0.033 | . | 8.28 | . | . | 15.26 | . | (0.26) | . | (0.8) |
| GBM921-14 | 2.9758 | 4.13 | . | . | . | . | 0.5305 | . | . | . | . | 0.0025 | 0.2821 | . | . |
| GBM916-9 | 2.9716 | . | . | . | . | . | 0.5257 | . | . | . | . | 0.0026 | 0.2710 | . | . |
| GBM321-11 | 2.0664 | 2.17 | . | . | . | . | 0.6834 | . | . | . | . | 0.0031 | 0.6596 | . | . |
| GBM921-8 | 2.0559 | . | . | . | . | . | 0.6823 | . | . | . | . | 0.0034 | 0.6515 | . | . |
| GBM919-12 | 1.6668 | 23.18 | . | . | . | . | 0.7274 | . | . | . | . | 0.0048 | 0.0206 | . | . |
| BCR 109 | . | . | . | . | . | 0.46 | 0.946 | 14.51 | 0.96 | 0.020 | . | . | 0.738 | . | . |

continued

| Number | Ag* | As | Au* | Bi* | C | Cl | Co | F | In | Mn | PbO | Se* | Sn | ZnO | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IMN TC/P10 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 240 g |
| CAN CZN-4 | 51.4 | 0.0356 | (0.04) | (10) | (0.09) | (0.003) | 0.00935 | (0.004) | (0.020) | (0.009) | . | 86.7 | (0.05) | . | 200 g |
| BCS 520 | 36 | 0.0228 | . | . | . | . | . | . | . | . | . | . | . | . | 100 g |
| NCS DC35017 | 0.013 | . | . | . | . | . | . | . | . | . | . | . | . | . | 50 g |
| NCS DC28169 | 48 | 0.0014 | . | . | . | . | . | . | . | . | . | . | . | . | 25 g |
| GBM305-12 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 or 250 g |
| GBM919-13 | 17.3 | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| GBM916-11 | 68.0 | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| IMN RG 8 | . | . | . | . | . | . | . | . | . | . | (0.72) | . | . | (4.36) | 130 g |
| GBM907-14 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 or 250 g |
| IMN RB 7 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 170 g |
| GBM921-14 | 41.3 | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 or 250 g |
| GBM916-9 | 40.6 | 0.0233 | . | . | . | . | 0.0044 | . | . | . | . | . | . | . | |
| GBM321-11 | 45.2 | . | . | . | . | . | . | . | . | . | . | . | . | . | 10 or 250 g |
| GBM921-8 | 45.3 | 0.0077 | . | . | . | . | 0.0044 | . | . | . | . | . | . | . | 10 or 250 g |
| GBM919-12 | 5.3 | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| BCR 109 | . | . | . | . | . | . | . | 0.0081 | . | . | . | . | . | . | 10 or 250 g |

## CRM ZINC ORE WITH EXTENSIVE ANALYSIS

analysis listed in mass % T = Total * Provisional Analysis CGL: 200 g GBW: 50 g JZn-1: 100 g units

| Number | Zn | $Al_2O_3$ | CaO | T.C | Cu | F | $Fe_2O_3$ | $H_2O-$ | $H_2O+$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | Pb | S | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 207 | 49.14 | 0.112 | 0.850 | . | 0.1940 | . | 10.45T | . | . | . | (0.068) | 6.20 | (0.016) | (0.026) | 0.3407 | 31.12 | (1.73) | . | . |
| GBW 07237 | 2.75 | 2.80 | 1.91 | . | 0.71 | 1.20 | 3.50 | . | . | 0.99 | 0.082 | 0.026 | 0.56 | . | 0.25 | 2.87 | 82.95 | 0.017 | . |
| JZn-1 * | 2.22 | 6.32 | 18.1 | (1.28) | (0.0029) | . | 11.8 | (0.61) | (1.71) | 0.83 | 1.94 | 1.49 | 0.45 | . | 0.161 | (1.30T) | (43.95) | 0.20 | (6.61) |

continued analysis listed in mg/kg

| Number | Ag | As | Ba | Be | Bi | Cd | Ce | Co | Cr | Cs | Dy | Eu | Er | Ga | Gd | Ge | Ho | In | La | Li |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 207 | 33.43 | 167.7 | (9.48) | (0.254) | 309.6 | 910.5 | (9.82) | 424.4 | (29.86) | (0.425) | . | . | . | (2.83) | . | (0.743) | . | 152.9 | (7.30) | . |
| GBW 07237 | 13.5 | 12.4 | . | . | 56.4 | 29.3 | 2.3 | . | (62) | . | 0.49 | 0.06 | 0.28 | 8.0 | 0.31 | 1.4 | 0.13 | 0.23 | 1.3 | (86) |
| JZn-1 * | . | (99) | (208) | . | . | (114) | . | (24) | (21) | . | . | . | . | . | . | . | . | . | . | (19.5) |

| Number | Lu | Mo | Nd | Ni | Pr | Rb | Sb | Sc | Se | Sm | Sn | Sr | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGL 207 | . | 255.6 | . | 11.18 | (0.938) | . | (3.24) | . | . | . | . | (5.65) | . | . | (0.450) | . | . | 7.86 | (1.52) | . | . | . |
| GBW 07237 | 0.08 | 2.8 | 0.92 | 5.5 | 0.30 | (73) | 1.1 | 0.33 | 2.3 | 0.36 | 6.1 | . | 0.10 | 0.17 | (1.1) | 0.49 | 0.05 | . | . | 3.4 | 4.5 | 0.42 |
| JZn-1 * | . | . | | (6) | . | (42) | (31) | . | . | . | . | (358) | . | . | . | . | . | . | (24) | . | . | . |

## CRM ZINC ORE - EXTENSIVE ANALYSIS ON CERTIFICATE

analysis listed in mass % except * which is mg/kg

| Number | ZnO | Zn | Ag* | Au* | Cu | Pb | S | Units | |
|---|---|---|---|---|---|---|---|---|---|
| IMS-485 | 95.37 | . | (0.1) | . | (0.0020) | (0.0004) | . | 100 g | |
| OREAS 620 | . | 3.15 | 38.5 | 0.685 | 0.173 | 0.774 | 2.52 | 60 g | last |

## CRM ZINC ORE

analysis listed in mass % except * which is mg/kg — 50 g units

| Number | Zn | $Al_2O_3$ | As | CaO | Cu | F | Fe | $K_2O$ | MgO | $Na_2O$ | Pb | S | $SiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC11050 | 44.05 | 0.21 | 0.74 | 0.81 | 1.216 | 0.054 | 15.77 | 0.059 | 0.059 | 0.013 | 0.088 | 31.37 | 0.81 |
| NCS DC11049 | 41.72 | 0.24 | 1.80 | 0.69 | 0.130 | 0.012 | 14.03 | 0.037 | 0.418 | 0.009 | 0.74 | 29.47 | 4.13 |
| NCS DC11051 | 37.08 | 1.51 | 1.75 | 1.06 | 1.04 | 0.43 | 15.33 | 0.55 | 0.264 | 0.090 | 0.077 | 27.43 | 8.02 |
| NCS DC11052 | 31.23 | 2.66 | 2.80 | 1.35 | 0.88 | 0.80 | 14.78 | 0.97 | 0.46 | 0.163 | 0.067 | 24.08 | 15.15 |
| NCS DC11053 | 25.87 | 3.64 | 3.69 | 1.52 | 0.73 | 1.15 | 14.72 | 1.33 | 0.62 | 0.24 | 0.060 | 21.47 | 21.04 |
| NCS DC11054 | 20.33 | 4.56 | 4.46 | 1.76 | 0.59 | 1.38 | 14.36 | 1.68 | 0.76 | 0.29 | 0.048 | 18.12 | 25.96 |
| NCS DC11055 | 10.38 | 6.55 | 6.18 | 2.15 | 0.32 | 1.92 | 13.78 | 2.40 | 1.06 | 0.39 | 0.032 | 12.55 | 36.84 |
| NCS DC11056 | 15.30 | 5.57 | 5.46 | 1.93 | 0.46 | 1.66 | 14.00 | 2.07 | 0.92 | 0.35 | 0.040 | 15.38 | 31.71 |
| NCS DC11057 | 0.31 | 8.52 | 7.91 | 2.55 | 0.047 | 2.48 | 12.99 | 3.07 | 1.38 | 0.52 | 0.013 | 6.80 | 48.03 |

continued analysis

| Number | Ag | Au* | Bi | Cd | Co | Ge* | Hg | Mn | Sb | Se* | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC11050 | 0.0090 | 0.27 | 0.019 | 0.242 | 0.00090 | (0.3) | (0.00015) | 0.069 | 0.009 | (4) | 0.065 |
| NCS DC11049 | 0.021 | (0.05) | 0.00017 | 0.314 | 0.0051 | (0.7) | 0.0030 | 0.114 | 0.19 | (3) | 0.026 |
| NCS DC11051 | 0.0076 | 0.27 | 0.017 | 0.203 | 0.0022 | (0.5) | 0.00015 | 0.067 | 0.0097 | (4) | 0.058 |
| NCS DC11052 | 0.0067 | 0.27 | 0.015 | 0.170 | 0.0032 | (0.5) | 0.00013 | 0.063 | 0.011 | (4) | 0.052 |
| NCS DC11053 | 0.0058 | 0.26 | 0.015 | 0.144 | 0.0043 | (0.6) | 0.00011 | 0.062 | 0.012 | (4) | 0.050 |
| NCS DC11054 | 0.0047 | 0.27 | 0.014 | 0.107 | 0.0052 | (0.6) | 0.00009 | 0.063 | 0.013 | (3) | 0.044 |
| NCS DC11055 | 0.0030 | 0.24 | 0.012 | 0.059 | 0.0070 | (0.7) | 0.000040 | 0.054 | 0.014 | (3) | 0.037 |
| NCS DC11056 | 0.0039 | 0.25 | 0.013 | 0.085 | 0.0062 | (0.7) | 0.00007 | 0.057 | 0.013 | (3) | 0.041 |
| NCS DC11057 | 0.0012 | 0.24 | 0.0101 | 0.0019 | 0.0089 | (0.7) | 0.000011 | 0.047 | 0.017 | (2) | 0.025 |

## CRM ZIRCONIUM ORE

analysis listed in mass %

| Number | $ZrO_2$ | $Al_2O_3$ | CaO | F | FeO | $Fe_2O_3$(T) | $H_2O$+ | $HfO_2$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | $RE_xO_y$* | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86316 | 4.68 | (14.57) | 0.63 | 0.027(F-) | 0.10 | 0.38 | 0.49 | 0.084 | 3.90 | 0.079 | 0.021 | 4.20 | 0.040 | 0.0515 | 70.73 | 0.64 | 0.56 |
| NCS DC86308 | 1.25 | 14.70 | 2.64 | 0.082 | 1.82 | 4.69 | 1.29 | 0.025 | 3.31 | 2.01 | 0.083 | 3.74 | 0.167 | 0.022 | 65.66 | 0.410 | 1.51 |
| NCS DC86307 | 0.187 | 14.74 | 2.70 | 0.080 | 1.83 | 4.80 | 1.35 | 0.00421 | 3.37 | 2.10 | 0.085 | 3.83 | 0.163 | 0.018 | 66.02 | 0.420 | 1.55 |

* $RE_xO_y$: Rare Earth Oxide

continued analysis listed in mg/kg

| Number | $CeO_2$ | $Dy_2O_3$ | $Er_2O_3$ | $Eu_2O_3$ | $Gd_2O_3$ | $Ho_2O_3$ | $La_2O_3$ | $Lu_2O_3$ | $Nd_2O_3$ | $Pr_6O_{11}$ | $Sc_2O_3$ | $Sm_2O_3$ | $Tb_4O_7$ | Th | $Tm_2O_3$ | W | $Y_2O_3$ | $Yb_2O_3$ | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC86316 | 146 | 14.9 | 16.4 | 0.55 | 9.92 | 3.66 | 69.2 | 6.11 | 53.4 | 15.7 | 10.7 | 10.1 | 2.02 | 202 | 2.84 | 5.01 | 142 | 25.9 | 50 g |
| NCS DC86308 | 74.4 | 4.6 | 4.6 | 1.2 | (4.1) | 1.3 | 37.9 | 1.5 | 26.9 | 7.8 | 14.8 | 4.9 | 0.74 | 15.2 | 0.92 | . | 41.9 | 7.8 | 50 g |
| NCS DC86307 | 70.7 | 2.8 | 1.8 | 1.2 | 3.4 | 0.59 | 36.6 | 0.38 | 27.5 | 7.7 | 14.1 | 4.7 | 0.53 | 7.8 | 0.31 | . | 19.5 | 2.2 | 50 g |

## ZIRCONIUM MATERIALS

CERAM: 25 or 100 g IGS: 50 g NCS: 20 g all others: 100 g units

| Number | $ZrO_2$ | $HfO_2$ | $ZrO_2$ + $HfO_2$ | $Al_2O_3$ | CaO | $Fe_2O_3$ | $K_2O$ | MgO | $Na_2O$ | $P_2O_5$ | $SiO_2$ | $TiO_2$ | LOI | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CRM | | | | | | | | | | | | | | |
| NCS HC26618 | . | . | 99.48 | 0.009 | 0.17 | 0.054 | . | 0.093 | . | . | 0.11 | . | . | |
| BCS 358 | 92.70 | 1.63 | . | 0.08 | 1.50 | 0.065 | . | 3.42 | . | . | 0.21 | 0.20 | 0.08 | BaO: 0.10 SrO: 0.07 |
| VS K7/3 | . | . | 92.2 | (0.1) | 5.39 | 0.73 | . | . | . | . | 0.65 | . | . | |
| VS K8/2 | 65.9 | . | . | 1.16 | . | 0.081 | . | . | . | 0.110 | 32.3 | 0.163 | . | S: 0.0064 |
| BCS 388 | (64.9) | 1.28 | 66.2 | 0.291 | . | 0.049 | . | . | . | 0.122 | 32.7 | 0.232 | . | $ThO_2$:0.019 $U_3O_8$:0.034 $Y_2O_3$: 0.136 |
| SARM 13 | 64.01 | 1.29 | . | 0.61 | (0.14) | 0.187 | . | (0.0440) | . | 0.23 | 32.56 | 0.295 | . | Th: (0.0300) U:(0.0328) |
| IGS 35 | Zr:48.96 | Hf:1.20 | . | . | . | . | . | . | . | . | . | Ti:0.16 | . | |
| RM | | | | | | | | | | | | | | |
| CERAM 2CAS15 | (63.6) | (1.28) | 65.0 | 0.38 | 0.28 | 0.07 | 0.01 | 0.07 | 0.02 | . | 33.9 | 0.20 | 0.23 | |
| CERAM AN46 | 15.41 | 0.32 | 15.68 | 30.52 | 0.20 | 0.85 | 1.03 | 5.34 | 0.15 | . | 45.46 | 0.48 | 0.08 | $Li_2O$: 0.02 |
| BCS 204A | . | . | 53.8 | 0.74 | 0.15 | 0.18 | 0.017 | 0.012 | 0.014 | 0.77 | 37.6 | 2.22 | 0.50 | $SnO_2$: 1.69 |

## CRM ISO 17025 / 17034 ACCREDITED GEOLOGICAL SAMPLES

analysis in mass %

| Number | Type | Al | $Al_2O_3$ | Ca | CaO | Fe | $T.Fe_2O_3$ | K | $K_2O$ | Mg | MgO | Mn | MnO | Na | $Na_2O$ | $P_2O_5$ | Si | $SiO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH-ASC-21-P | ANORTHOSITE | 16.1 | 30.5 | 11.0 | 15.4 | 1.04 | 1.48 | 0.064 | 0.077 | 0.78 | 1.29 | 0.0167 | 0.0216 | 1.57 | 2.12 | . | 22.2 | 47.4 |
| MBH-AU-ORE1-21-P | GOLD ORE | 2.90 | 5.48 | 2.39 | 3.35 | 1.64 | 2.35 | 0.60 | 0.72 | 0.85 | 1.41 | 0.0066 | 0.0085 | (0.0400) | . | 0.143 | 36.8 | 78.8 |
| MBH-BAS-MC-22-P | BASALT | 8.84 | 16.7 | 7.05 | 9.87 | 8.6 | 12.3 | 0.69 | 0.83 | 4.80 | 7.96 | 0.145 | 0.187 | 2.49 | 3.36 | 0.722 | 21.8 | 46.6 |
| MBH-FCT-21-P | DACITE | 8.52 | 16.1 | 2.55 | 3.57 | 3.32 | 4.74 | 3.20 | 3.86 | 0.84 | 1.40 | 0.081 | 0.104 | 2.72 | 3.67 | 0.225 | 30.1 | 64.4 |
| MBH-NSC-21-P | NORITE | 13.4 | 25.4 | 10.0 | 14.0 | 2.34 | 3.34 | 0.041 | 0.049 | 4.08 | 6.77 | 0.046 | 0.059 | 0.91 | 1.23 | . | 22.5 | 48.1 |

continued analysis in mass %

| Number | Ti | $TiO_2$ | LOI |
|---|---|---|---|
| MBH-ASC-21-P | 0.035 | 0.058 | (1.34) |
| MBH-AU-ORE1-21-P | 0.167 | 0.278 | (6.3) |
| MBH-BAS-MC-22-P | 1.12 | 1.86 | (0.6) |
| MBH-FCT-21-P | 0.344 | 0.573 | (1.2) |
| MBH-NSC-21-P | 0.038 | 0.064 | (0.78) |

remainder analysis in mg/gkg except as noted

| Number | Ag | As | Au | Ba | Bi | C% | Cd | Ce | Co | Cr | Cs | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH-ASC-21-P | . | . | . | 32 | . | . | (0.03) | 1.56 | 6.2 | 56 | . | 17.4 | 0.206 | (0.1) | 0.22 |
| MBH-AU-ORE1-21-P | 0.21 | 1079 | 8.9 | 2311 | 0.199 | (1.03) | 0.96 | 41 | 4.5 | 45 | 3.76 | 29.9 | 2.47 | 1.34 | 0.7 |
| MBH-BAS-MC-22-P | . | (3.6) | . | 836 | . | . | (0.09) | 104 | 50 | 86 | 0.22 | 55 | 4.8 | 2.3 | 2.4 |
| MBH-FCT-21-P | (0.05) | 3.3 | . | 924 | (0.1) | . | (0.07) | 84 | 10.3 | (5) | . | 9 | 3.9 | 2.22 | 1.33 |
| MBH-NSC-21-P | . | . | . | 16.3 | . | . | . | (1) | 21.8 | 586 | . | 11.4 | 0.22 | 0.18 | 0.134 |

| Number | Ga | Gd | Ge | Hf | Hg | Ho | La | Li | Lu | Mo | Nb | Nd | Ni | P | Pb | Pr | Rb | Re | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH-ASC-21-P | 15.7 | (0.2) | . | 0.07 | . | (0.04) | (0.9) | 2 | (0.02) | (0.1) | . | (0.7) | 36 | (30) | (0.6) | (0.2) | 0.93 | . | . |
| MBH-AU-ORE1-21-P | 6.4 | 3.1 | (0.1) | 3.9 | 11.4 | 0.47 | 23.7 | 30.5 | 0.19 | 10.4 | 5.5 | 19.5 | 30 | 620 | 6.9 | 5.2 | 33.6 | (0.008) | 1.65 |
| MBH-BAS-MC-22-P | 20 | (6.2) | (0.6) | 3.6 | . | 0.9 | 53.5 | (7.6) | (0.31) | 1.6 | 42 | 47 | 91 | 3150 | 5.7 | 12 | 9.1 | . | (140) |
| MBH-FCT-21-P | 18.5 | 4.6 | . | 5.6 | . | 0.74 | 44.2 | 19.5 | 0.33 | (0.7) | 15.2 | 34.7 | (4) | 980 | 16 | 9.5 | 104 | . | . |
| MBH-NSC-21-P | 12.1 | 0.19 | . | (0.1) | . | (0.05) | 0.52 | 1.4 | (0.05) | . | (0.2) | (0.5) | 158 | (30) | (0.3) | (0.1) | 0.86 | . | . |

| Number | Sb | Sc | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | U | V | W | Y | Yb | Zn | Zr | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH-ASC-21-P | . | 4.4 | (0.2) | . | 151 | . | (0.03) | . | . | . | . | 24 | . | 1.18 | (0.1) | 9.5 | (2.3) | 75 g |
| MBH-AU-ORE1-21-P | 106 | 4.3 | 3.6 | 2.6 | 35 | 0.38 | 0.43 | 0.29 | 5.6 | 17.7 | 4.9 | 136 | 32 | 15.1 | 1.23 | 90 | 153 | 200 g |
| MBH-BAS-MC-22-P | (0.08) | 27.1 | 7.8 | (1.3) | 978 | 2.13 | 0.85 | . | 6 | . | 1.4 | 247 | (0.32) | 24.4 | 2 | 102 | 158 | 75 g |
| MBH-FCT-21-P | (0.3) | 8.1 | 6 | 1.7 | 526 | 1.02 | 0.66 | . | 10.8 | (0.4) | 3.6 | 69 | (0.6) | 21.8 | 2.2 | 68 | 209 | 75 g |
| MBH-NSC-21-P | . | 11 | 0.13 | . | 97 | . | (0.03) | . | (0.09) | . | (0.04) | 44 | . | 1.37 | (0.2) | 17.9 | 2.8 | 75 g |

## CRM ISO 17025 / 17034 ACCREDITED RARE EARTH ORE

# = class where 1 = CRM and 2 = RM analysis listed in mass %

| 2 | Number | Al | $Al_2O_3$ | Ba | BaO | C | $CO_3$ | Ca | CaO | Ce | $CeO_2$ | Dy | Eu | Fe | $Fe_2O_3$ | Ho |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | MBH REE-HI-22-P | 0.18 | 0.33 | 8.9 | 9.9 | . | . | 23.7 | 33.1 | 1.9 | 2.30 | 0.0025 | 0.0050 | 0.93 | 1.3 | 0.00033 |
| 2 | MBH REE-LO-22-P | 0.16 | 0.31 | 0.67 | 0.75 | . | . | 35.94 | 50.3 | 0.14 | 0.18 | 0.00026 | 0.00042 | 0.20 | 0.29 | 0.000038 |
| 2 | MBH REE-MID-22-P | 0.15 | 0.29 | 1.7 | 1.9 | . | . | 34.4 | 48.1 | 0.37 | 0.45 | 0.00056 | 0.0010 | 0.030 | 0.42 | 0.000076 |
| 1 | MBH REE-ORE1-22-P | 0.21 | 0.39 | 17.8 | 19.9 | 4.8 | 24 | 10.2 | 14.3 | 3.7 | 4.5 | 0.0049 | 0.0100 | 1.73 | 2.47T | 0.00056 |

| Number | K | $K_2O$ | La | $La_2O_3$ | Lu | Mg | MgO | Mn | MnO | Nb | Nd | $Nd_2O_3$ | P | $P_2O_5$ | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH REE-HI-22-P | 0.093 | 0.110 | 1.3 | 1.5 | 0.000060 | 1.8 | 3.0 | 0.18 | 0.23 | 0.0023 | 0.45 | 0.52 | 0.13 | 0.30 | 0.1990 |
| MBH REE-LO-22-P | 0.029 | 0.035 | 0.10 | 0.12 | 0.000007 | 1.7 | 2.8 | 0.028 | 0.037 | 0.00025 | 0.034 | 0.040 | 0.041 | 0.095 | 0.0149 |
| MBH REE-MID-22-P | 0.038 | 0.045 | 0.26 | 0.30 | 0.000015 | 1.7 | 2.9 | 0.047 | 0.061 | 0.00053 | 0.089 | 0.10 | 0.053 | 0.12 | 0.0383 |
| MBH REE-ORE1-22-P | 0.154 | 0.186 | 2.64 | 3.1 | 0.000104 | 1.93 | 3.2 | 0.333 | 0.43 | 0.0043 | 0.91 | 1.06 | 0.223 | 0.51 | (0.4100) |

| Number | Pr | $Pr_6O_{11}$ | Rb | $RE_xO_Y$ | S | Sc | Si | $SiO_2$ | Sm | $SO_3$ | $SO_4$ | $Sm_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH REE-HI-22-P | 0.16 | 0.2 | 0.00038 | 4.50 | 2.7 | 0.00057 | 3.3 | 7.2 | 0.0303 | 6.6 | . | . |
| MBH REE-LO-22-P | 0.013 | 0.015 | 0.00015 | 0.35 | 0.20 | 0.0085 | 0.88 | 1.9 | 0.0024 | 0.49 | . | . |
| MBH REE-MID-22-P | 0.031 | 0.038 | 0.00017 | 0.89 | 0.51 | 0.00015 | 1.2 | 2.6 | 0.0061 | 1.3 | . | . |
| MBH REE-ORE1-22-P | 0.34 | 0.41 | 0.0006 | . | 5.2 | 0.0010 | 6.1 | 13.1 | 0.064 | . | 15.6 | 0.074 |

| Number | Sr | SrO | Th | Ti | $TiO_2$ | U | Y | Yb | LOI | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| MBH REE-HI-22-P | 1.6 | 1.90 | 0.0127 | 0.012 | 0.021 | 0.0017 | 0.0089 | 0.00041 | 30.4 | 90 g |
| MBH REE-LO-22-P | 0.19 | 0.22 | 0.00098 | 0.012 | 0.019 | 0.00018 | 0.0010 | 0.000050 | 42.1 | 90 g |
| MBH REE-MID-22-P | 0.38 | 0.44 | 0.0025 | 0.012 | 0.019 | 0.00039 | 0.0021 | 0.000098 | 40.4 | 90 g |
| MBH REE-ORE1-22-P | 3.1 | 3.7 | 0.0246 | 0.015 | 0.025 | 0.0034 | 0.0165 | 0.00072 | 17.5 | 100 g |

## CRM ISO 17025 / 17034 ACCREDITED GEOLOGICAL SAMPLES

analysis in mass % 50 g units

| Number | Type | $Al_2O_3$ | C | CaO | $Fe_2O_3$ | $H_2O$ | $K_2O$ | MgO | MnO | $Na_2O$ | $P_2O_5$ | S | $SiO_2$ | $TiO_2$ | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC18.10657 | Basalt | 14.23 | (0.068) | 8.42 | 11.34 | (1.07) | 0.901 | 7.20 | 0.145 | 3.08 | 0.332 | 0.0142 | 51.05 | 1.80 | (1.26) |
| AC18.10658 | Ophiolite | 13.02 | (0.453) | 10.60 | 13.14 | (0.6) | 0.115 | 6.69 | 0.208 | 2.64 | 0.122 | 0.1968 | 47.19 | 1.20 | 4.76 |
| AC18.10659 | Gabbro | 16.65 | (0.032) | 9.32 | 10.40 | (0.56) | 2.07 | 5.10 | 0.166 | 2.58 | 0.421 | (0.014) | 51.68 | 1.27 | (0.184) |
| AC18.10660 | Flagstone | 11.37 | (2.31) | 6.13 | 5.48 | (0.56) | 2.85 | 5.94 | 0.0931 | 1.32 | 0.200 | 0.0406 | 55.46 | 0.829 | 10.54 |
| AC18.10661 | Andesite | 16.70 | (0.130) | 5.62 | 6.14 | (1.73) | 0.763 | 3.27 | 0.0885 | 4.27 | 0.233 | (0.011) | 57.67 | 0.713 | 4.90 |
| AC18.10662 | Granodiorite | 14.65 | (0.092) | 2.515 | 4.654 | (0.64) | 3.524 | 1.410 | 0.0514 | 2.658 | 0.203 | 0.0972 | 67.75 | 0.661 | 1.19 |
| AC18.10663 | Siltstone | 16.24 | (0.013) | 0.070 | 4.128 | (0.68) | 3.174 | 0.669 | 0.0042 | 0.227 | 0.0783 | (0.012) | 69.99 | 0.822 | 3.83 |

continued analysis listed in mg/kg

| Number | Ag | As | Au | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC18.10657 | <5 | <0.5 | <0.002 | <50 | 261 | 1.27 | <2 | <0.5 | <10 | 36.7 | (102) | 46.1 | 252 | 0.82 | 52 | 4.42 | 2.25 | 1.66 | (195) |
| AC18.10658 | <5 | <5 | <0.002 | <50 | 75 | <5 | <2 | <0.5 | <10 | 10.6 | . | 47.7 | 110 | (0.32) | 164 | 4.25 | 2.73 | 0.92 | (129) |
| AC18.10659 | <5 | <5 | <0.002 | <50 | 560 | 1.90 | <0.1 | <0.5 | <10 | 51 | (248) | 33.8 | 104 | 5.37 | 64 | 4.24 | 2.30 | 1.68 | (262) |
| AC18.10660 | <5 | 20.3 | <0.002 | 184 | 345 | 2.09 | 1.02 | <0.5 | <10 | 62.3 | . | 13.4 | 65 | 6.94 | 29.1 | 4.96 | 2.83 | 1.16 | (809) |
| AC18.10661 | <5 | <5 | <0.002 | <50 | 292 | 0.98 | <2 | <0.5 | <10 | 32.8 | . | 18.6 | 66 | 0.83 | 47.9 | 3.47 | 1.99 | 1.11 | (238) |
| AC18.10662 | <5 | 7.6 | <0.002 | 24.4 | 1036 | 2.42 | 0.93 | <0.5 | <10 | 82.5 | (110) | 9.7 | 58 | 12.03 | 24.9 | 6.40 | 3.26 | 1.50 | (725) |
| AC18.10663 | <5 | 501 | (0.025) | 1520 | 707 | 3.33 | 22.5 | <0.5 | <10 | 102.2 | . | 2.08 | 119 | 11.81 | 33 | 5.87 | 3.40 | 1.41 | (662) |

| Number | Ga | Gd | Ge | Hf | Hg | Ho | In | Ir | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb | Re |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC18.10657 | 19.6 | 5.26 | 1.29 | (3.57) | <1 | 0.83 | <0.2 | <0.005 | 18.29 | (76.2) | 0.24 | <5 | 20.6 | 20.3 | 146 | (5.85) | 4.55 | 22.5 | <0.1 |
| AC18.10658 | 16.1 | 3.65 | 1.12 | (1.88) | <1 | 0.89 | <0.2 | <0.005 | 4.34 | 9.72 | 0.40 | <1 | 3.41 | 8.61 | 64 | (3.88) | 1.62 | (2.25) | <0.1 |
| AC18.10659 | 20.5 | 5.26 | 1.66 | (2.63) | <1 | 0.80 | <0.2 | <0.005 | 24.6 | 15.9 | 0.309 | <5 | 7.55 | 28.0 | 45.4 | (11.1) | 6.56 | 102 | <0.1 |
| AC18.10660 | 15.8 | 5.57 | 1.80 | (5.56) | <1 | 0.95 | <0.2 | <0.005 | 32.5 | 58.2 | 0.37 | <1 | 10.8 | 29.3 | 23.9 | 20.4 | 7.65 | 129.8 | <0.1 |
| AC18.10661 | 18.1 | 3.92 | 1.02 | (3.34) | <1 | 0.656 | <0.2 | <0.005 | 15.3 | 15.9 | 0.285 | <5 | 3.71 | 18.9 | 31.3 | (10.3) | 4.27 | 17.43 | <0.1 |
| AC18.10662 | 20.3 | 7.56 | 1.68 | 7.0 | <1 | 1.17 | <0.2 | <0.005 | 41.9 | 54.7 | 0.403 | <5 | 11.8 | 38.4 | (20.9) | 30.9 | 9.91 | 174.8 | <0.1 |
| AC18.10663 | 21.8 | 6.44 | 2.04 | (7.62) | <1 | 1.18 | <0.2 | <0.005 | 52.0 | 48.1 | 0.47 | <5 | 16.4 | 41.9 | (17.7) | 22.6 | 11.57 | 150.2 | <0.1 |

| Number | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC18.10657 | <0.1 | 19.4 | <3 | 5.03 | (1.80) | 399 | 1.24 | 0.78 | <1 | 2.93 | <0.5 | 0.297 | 0.74 | 164 | <5 | 21.7 | 1.76 | 110 | 138 |
| AC18.10658 | <2 | 41.2 | <3 | 2.73 | <200 | 126 | <5 | 0.62 | <1 | 0.46 | <0.5 | 0.38 | <5 | 338 | <5 | 23.5 | 2.57 | 97 | 72 |
| AC18.10659 | <0.1 | 25.0 | <3 | 5.90 | 2.23 | 578 | <5 | 0.70 | <1 | 8.22 | <0.5 | 0.32 | 1.80 | 286 | <5 | 22.0 | 2.11 | 96 | 94 |
| AC18.10660 | <2 | 11.60 | <3 | 5.94 | 3.88 | 121.9 | <5 | 0.81 | <1 | 13.44 | 0.51 | 0.406 | 2.41 | 89.1 | <20 | 26.7 | 2.64 | 76.9 | 197 |
| AC18.10661 | <2 | 15.5 | <3 | 4.06 | <200 | 634 | <5 | 0.56 | <1 | 1.81 | <0.5 | 0.272 | 0.53 | 130 | <5 | 18.3 | 1.85 | 79.3 | 127 |
| AC18.10662 | <2 | 8.4 | <3 | 8.1 | 4.9 | 157.9 | <5 | 1.10 | <1 | 16.30 | 0.98 | 0.446 | 4.85 | 65 | 13.5 | 32.4 | 2.82 | 89.2 | 244 |
| AC18.10663 | 6.19 | 15.8 | <3 | 7.43 | 19.5 | 78.0 | 1.35 | 0.96 | <1 | 18.35 | 0.831 | 0.507 | 3.44 | 113.5 | 93 | 31.4 | 3.23 | 42 | 238 |

## CRM SOIL WITH EXTENSIVE ANALYSIS - CONTINUED ON THE NEXT PAGE

analysis listed in mass % 70 g units

| Number | $Al_2O_3$ | C | CaO | $CO_2$ | Org.C | T.$Fe_2O_3$ | FeO | $H_2O$ | $K_2O$ | MgO | $Na_2O$ | S | $SiO_2$ | Ti | LOI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73058 | 14.84 | 2.29 | 1.39 | | 2.07 | 5.13 | (1.1) | 4.90 | 2.72 | 1.24 | 1.73 | 0.0227 | 62.32 | 0.476 | (9) |
| NCS DC73059 | 13.21 | 1.03 | 2.18 | (1.1) | 0.76 | 4.98 | 1.32 | 3.13 | 2.51 | 2.07 | 1.95 | 0.0124 | 66.74 | 0.457 | 5.16 |
| NCS DC73060 | 12.70 | 1.68 | 1.18 | | 1.51 | 8.29 | 1.39 | 5.03 | 1.83 | 0.92 | 0.13 | 0.0401 | 65.60 | 0.41 | 7.92 |
| NCS DC73061 | 11.04 | 1.82 | 0.36 | | 1.63 | 3.84 | (1.1) | 4.31 | 1.76 | 0.42 | 0.26 | 0.0494 | 73.80 | 0.425 | 7.16 |
| NCS DC73062 | 12.10 | 2.25 | 6.42 | 4.48 | 1.06 | 4.52 | (1.5) | 3.89 | 2.46 | 2.34 | 1.68 | 0.0279 | 59.83 | 0.392 | 9.42 |
| NCS DC73063 | 11.92 | 2.35 | 9.33 | 6.89 | 0.52 | 4.40 | 1.74 | 3.67 | 3.11 | 3.20 | 1.83 | 0.27 | 53.97 | 0.313 | (10.9) |
| NCS DC73064 | 11.90 | 2.59 | 8.03 | 6.13 | 0.95 | 4.47 | (1.5) | 3.86 | 2.44 | 2.70 | 1.54 | 0.0348 | 56.71 | 0.348 | (10.9) |
| NCS DC73065 | 10.54 | 1.73 | 4.82 | 3.70 | 0.78 | 4.00 | 1.56 | 3.31 | 2.18 | 2.79 | 1.60 | 0.0368 | 65.49 | 0.280 | 7.70 |
| NCS DC73066 | 9.89 | 0.81 | 3.00 | (1.8) | 0.38 | 2.63 | 0.64 | 2.25 | 2.57 | 1.04 | 1.73 | 0.0141 | 74.15 | 0.240 | 4.31 |
| NCS DC73067 | 16.12 | 2.96 | 1.23 | . | 2.75 | 4.27 | (1.71) | . | 2.87 | 1.16 | 2.42 | 0.0351 | 60.21 | 0.442 | (10.57) |
| NCS DC73068 | 12.73 | 1.41 | 1.19 | . | 1.34 | 2.99 | (0.89) | . | 2.99 | 0.73 | 2.36 | 0.0229 | 70.86 | 0.355 | (5.15) |
| NCS DC73069 | 14.23 | 0.72 | 1.06 | . | 0.68 | 3.96 | (0.58) | . | 3.27 | 0.94 | 1.83 | 0.0104 | 68.47 | 0.336 | (5.51) |
| NCS DC73070 | 8.65 | 0.32 | 0.73 | . | 0.28 | 1.44 | (0.64) | . | 3.02 | 0.43 | 1.82 | 0.0107 | 81.68 | 0.189 | (1.59) |
| NCS DC73071 | 13.47 | 2.02 | 6.69 | . | 0.69 | 5.78 | (1.95) | . | 2.70 | 4.18 | 1.90 | 0.0000369 | 53.00 | 0.361 | (11.45) |
| NCS DC73072 | 12.54 | 0.85 | 2.59 | . | 0.71 | 3.36 | (1.52) | . | 2.57 | 1.63 | 3.21 | 0.0000213 | 68.33 | 0.290 | (4.57) |
| NCS DC73073 | 13.70 | 1.30 | 5.47 | . | 0.54 | 4.84 | (1.39) | . | 2.69 | 2.64 | 2.81 | 0.0000123 | 58.84 | 0.374 | (7.41) |
| NCS DC73074 | 11.69 | 1.95 | 7.28 | . | 0.55 | 3.79 | (1.85) | . | 2.59 | 2.38 | 2.15 | (0.0206) | 60.93 | 0.311 | (8.31) |
| NCS DC73075 | 11.20 | 2.44 | 9.44 | . | 0.48 | 3.96 | (1.71) | . | 2.42 | 2.61 | 1.88 | 0.0262 | 57.08 | 0.316 | (10.46) |
| NCS DC73076 | 13.03 | 0.99 | 4.42 | . | 0.34 | 4.08 | (0.79) | . | 2.70 | 2.37 | 2.07 | 0.0315 | 63.89 | 0.298 | (6.37) |
| NCS DC73077 | 9.54 | 3.81 | 15.26 | . | 0.44 | 3.46 | (0.86) | . | 2.09 | 1.98 | 1.01 | 0.0324 | 49.83 | 0.273 | (16.17) |
| NCS DC73078 | 13.50 | 0.80 | 3.46 | . | (0.12) | 5.70 | (0.69) | . | 2.24 | 1.82 | 0.54 | (0.0087) | 64.37 | 0.394 | (7.18) |
| NCS DC73079 | 11.48 | 0.91 | 4.22 | . | 0.17 | 4.46 | (1.35) | . | 2.16 | 1.50 | 1.44 | (0.0073) | 68.11 | 0.351 | (5.69) |
| NCS DC73080 | 12.15 | 0.69 | 1.95 | . | 0.66 | 3.15 | (1.10) | . | 2.50 | 0.97 | 2.29 | 0.0132 | 73.16 | 0.282 | (2.72) |
| NCS DC73081 | 10.74 | 1.70 | 6.62 | . | 0.30 | 4.31 | (1.83) | . | 2.12 | 3.09 | 1.72 | 0.0000229 | 61.47 | 0.334 | (8.85) |
| NCS DC73082 | 10.58 | 1.69 | 6.28 | . | 0.36 | 3.70 | (1.69) | . | 2.03 | 1.77 | 2.10 | 0.0291 | 65.18 | 0.313 | (7.49) |
| NCS DC73083 | 11.91 | 2.12 | 3.88 | . | 1.45 | 4.22 | (1.23) | . | 2.26 | 1.78 | 1.75 | 0.0322 | 65.27 | 0.407 | (7.71) |
| NCS DC73084 | 12.47 | 1.91 | 7.12 | . | 0.52 | 4.67 | (1.26) | . | 2.40 | 2.35 | 1.61 | 0.0173 | 58.76 | 0.385 | (9.55) |
| NCS DC73085 | 14.10 | 1.60 | 1.43 | . | 1.50 | 5.45 | (1.53) | . | 2.41 | 1.70 | 1.62 | 0.0286 | 65.32 | 0.461 | (6.77) |
| NCS DC73086 | 12.23 | 0.60 | 1.23 | . | 0.59 | 4.78 | (0.74) | . | 2.12 | 1.15 | 1.32 | 0.0119 | 71.11 | 0.470 | (4.62) |
| NCS DC73087 | 10.57 | 1.27 | 0.81 | . | 1.23 | 3.62 | (1.09) | . | 1.60 | 0.69 | 1.51 | 0.0216 | 74.76 | 0.500 | (5.09) |
| NCS DC73088 | 16.06 | 2.33 | 1.22 | . | 2.23 | 4.14 | (1.90) | . | 2.59 | 2.09 | 0.99 | 0.0459 | 62.03 | 0.537 | (9.35) |
| NCS DC73089 | 12.80 | 1.41 | 5.66 | . | 0.42 | 4.21 | (0.62) | . | 2.31 | 1.43 | 1.44 | 0.0170 | 62.62 | 0.344 | (8.58) |
| NCS DC73090 | 13.71 | 0.46 | 0.95 | . | 0.45 | 4.85 | (0.74) | . | 2.48 | 1.66 | 1.41 | 0.0119 | 68.21 | 0.434 | (5.84) |
| NCS DC73091 | 13.84 | 0.48 | 1.37 | . | 0.34 | 5.67 | (0.65) | . | 2.19 | 1.21 | 0.85 | (0.0102) | 67.62 | 0.539 | (5.69) |
| NCS DC73092 | 22.66 | (0.25) | (0.06) | . | (0.23) | 5.46 | (0.62) | . | 3.19 | 0.57 | (0.09) | (0.0094) | 58.51 | 0.445 | (8.09) |
| NCS DC73093 | 24.45 | (0.28) | (0.18) | . | (0.23) | 10.94 | (0.46) | . | 1.65 | 1.19 | (0.13) | 0.0184 | 48.80 | 0.556 | (11.36) |
| NCS DC73094 | 22.48 | (0.2) | 0.59 | . | (0.15) | 6.75 | (1.31) | . | 1.98 | 2.02 | 0.62 | (0.0107) | 56.28 | 0.505 | (7.57) |
| NCS DC73095 | 21.67 | 0.78 | 0.46 | . | (0.63) | 11.5 | (0.91) | . | 1.49 | 1.55 | (0.13) | (0.0176) | 49.13 | 1.05 | (11.49) |
| NCS DC73096 | 18.03 | 0.41 | (0.1) | . | 0.40 | 4.67 | (0.48) | . | 0.46 | 0.21 | (0.06) | 0.0271 | 67.23 | 0.424 | (8.15) |
| NCS DC73097 | 13.87 | (0.2) | (0.13) | . | (0.19) | 6.64 | (0.54) | . | 0.82 | 0.29 | (0.06) | 0.0247 | 71.18 | 0.465 | (6.29) |
| NCS DC73098 | 15.79 | 1.71 | 0.69 | . | 1.63 | 6.44 | (1.90) | . | 2.48 | 1.75 | 0.46 | 0.0284 | 62.60 | 0.655 | (8.40) |
| NCS DC73099 | 11.86 | 0.57 | 0.34 | . | 0.53 | 2.99 | (0.73) | . | 2.61 | 0.31 | 0.26 | 0.0120 | 75.50 | 0.372 | (4.92) |
| NCS DC73100 | 7.77 | 1.02 | 0.26 | . | 0.96 | 2.54 | (0.66) | . | 2.03 | 0.35 | 0.57 | 0.0158 | 81.70 | 0.413 | (3.72) |
| NCS DC73101 | 14.25 | 0.28 | 0.30 | . | 0.26 | 6.46 | (0.65) | . | 1.69 | 0.68 | 0.42 | 0.0174 | 68.94 | 0.662 | (5.90) |
| NCS DC73102 | 18.65 | (0.11) | (0.04) | . | (0.11) | 4.37 | (0.30) | . | 2.03 | 0.44 | (0.08) | 0.0119 | 66.91 | 0.229 | (7.09) |
| NCS DC73103 | 17.99 | (0.24) | 0.38 | . | (0.23) | 3.82 | (0.91) | . | 1.48 | 0.33 | 0.14 | 0.0222 | 67.75 | 0.397 | (7.19) |
| NCS DC73104 | 6.16 | (0.17) | (0.15) | . | (0.15) | 1.58 | (0.37) | . | 0.21 | 0.18 | (0.08) | 0.0107 | 88.45 | 0.343 | (3.06) |
| Number | $Al_2O_3$ | C | CaO | $CO_2$ | Org.C | T.$Fe_2O_3$ | FeO | $H_2O$ | $K_2O$ | MgO | $Na_2O$ | S | $SiO_2$ | Ti | LOI |

## CRM SOIL WITH EXTENSIVE ANALYSIS - CONTINUED ON THE NEXT PAGE

continued analysis listed in mg/kg 70 g units

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73058 | 0.088 | 12.4 | 39 | 639 | 2.7 | 0.38 | 8.5 | 0.098 | 82 | 53 | 16.0 | 69 | 7.9 | 23.0 | 5.6 | 3.2 | 1.4 |
| NCS DC73059 | 0.093 | 9.3 | 56 | 679 | 2.23 | 0.31 | 2.4 | 0.33 | 70 | 48 | 15.5 | 72 | 6.4 | 31 | 5.2 | 2.9 | 1.4 |
| NCS DC73060 | 2.3 | 323 | 85 | 255 | 16.3 | 301 | 3.3 | 2.8 | 111 | 44 | 9.5 | 62 | 26 | 173 | 7.8 | 4.6 | 1.27 |
| NCS DC73061 | 0.157 | 12.9 | 131 | 314 | 2.2 | 0.63 | 7.0 | 0.2 | 82 | 85 | (5.9) | 60 | 7.7 | 25.3 | 5.2 | 2.9 | 1.29 |
| NCS DC73062 | 0.086 | 13.1 | 57 | 502 | 2.06 | 0.37 | 4.2 | 0.31 | 74 | 75 | 12.6 | 69 | 7.6 | 28 | 5.2 | 2.9 | 1.27 |
| NCS DC73063 | 0.077 | 13.2 | 58 | 557 | 2.55 | 0.42 | 2.3 | 0.174 | 70 | 209 | 11.0 | 48 | 8.6 | 24 | 5.1 | 2.9 | 1.2 |
| NCS DC73064 | 0.072 | 14.2 | 61 | 505 | 2.02 | 0.36 | 4.3 | 0.186 | 66 | 113 | 12.6 | 67 | 8.1 | 25.6 | 4.6 | 2.6 | 1.15 |
| NCS DC73065 | 0.060 | 11.4 | 46 | 564 | 1.68 | 0.25 | 2.3 | 0.121 | 51 | 91 | 12.0 | 84 | 5.1 | 24.1 | 3.6 | 2.0 | 0.98 |
| NCS DC73066 | 0.053 | 13.5 | 31 | 615 | 1.54 | 0.22 | 5.2 | 0.057 | 41 | 72 | 7.5 | 38 | 4.1 | 23.7 | 2.9 | 1.6 | 0.84 |
| NCS DC73067 | 0.114 | 8.3 | 20 | 715 | 2.9 | 0.37 | 5.2 | 0.127 | 85 | 53 | 11.3 | 48 | 9.6 | 12.9 | 4.8 | 2.6 | 1.31 |
| NCS DC73068 | 0.081 | 6.0 | 23 | 657 | 2.4 | 0.24 | 1.9 | 0.074 | 60 | 56 | 7.4 | 38 | 6 | 12.6 | 4.1 | 2.4 | 1.13 |
| NCS DC73069 | 0.068 | 7.6 | 28 | 761 | 2.2 | 0.27 | 3.2 | 0.078 | 60 | 45 | 10.9 | 50 | 6 | 17.2 | 4.2 | 2.44 | 1.08 |
| NCS DC73070 | 0.049 | 3.9 | 13.2 | 544 | 1.6 | 0.11 | 1.5 | 0.042 | 26 | 42 | 3.8 | (23) | 3.4 | (6.4 | 1.94 | 1.17 | 0.58 |
| NCS DC73071 | 0.084 | 19.9 | 68 | 614 | 2.22 | 0.38 | 3.4 | 0.18 | 64 | 0.345 | 18.6 | 113 | 8.4 | 40.3 | 4.5 | 2.6 | 1.16 |
| NCS DC73072 | 0.059 | 3.6 | 47 | 357 | 3.2 | 0.46 | 11.8 | 0.108 | 62 | 574 | 8.9 | 47 | 7.6 | 16.9 | 6.3 | 3.6 | 1.34 |
| NCS DC73073 | 0.084 | 10.0 | 37 | 468 | 2.2 | 0.33 | 2.4 | 0.19 | 58 | 871 | 12.9 | 55 | 6.1 | 28 | 5.3 | 3.07 | 1.2 |
| NCS DC73074 | (0.065) | 12.1 | 60 | 483 | 2.2 | 0.43 | 2.1 | 0.138 | 57 | 125 | 10.1 | 55 | 12.7 | 19.8 | 4.2 | 2.3 | 1.05 |
| NCS DC73075 | 0.069 | 17.1 | 54 | 503 | 2.0 | 0.27 | 1.8 | 0.160 | 56 | 156 | 11.0 | 57 | 14.8 | 22 | 4.2 | 2.40 | 1.03 |
| NCS DC73076 | 0.067 | 21.2 | 58 | 457 | 2.7 | 0.38 | 2.1 | 0.130 | 58 | 116 | 13.4 | 110 | 16.3 | 22 | 3.8 | 2.1 | 1.02 |
| NCS DC73077 | 0.059 | 16.8 | 74 | 356 | 1.7 | 0.25 | 4.0 | 0.109 | 48 | 57 | 10.4 | 70 | 20.3 | 18.6 | 3.07 | 1.75 | 0.86 |
| NCS DC73078 | 0.075 | 6.8 | 40 | 341 | 2.1 | 0.29 | (0.77) | 0.066 | 69 | 428 | 12.9 | 82 | 9.0 | 16.2 | 4.3 | 2.45 | 1.23 |
| NCS DC73079 | 0.055 | 15.2 | 68 | 383 | 2.6 | 0.29 | (0.7) | (0.08) | 75 | (32) | 11.7 | 74 | 15.5 | 24 | 4.0 | 2.0 | 1.3 |
| NCS DC73080 | 0.085 | 5.7 | 27 | 431 | 2.4 | 0.31 | 1.4 | 0.18 | 79 | 71 | 7.6 | 34 | 8.8 | 16.0 | 4.7 | 2.6 | 1.19 |
| NCS DC73081 | (0.07) | 12.3 | 42 | 572 | 1.57 | 0.25 | 1.5 | 0.146 | 55 | 480 | 12.6 | 80 | 4.8 | 27.0 | 4.1 | 2.3 | 1.05 |
| NCS DC73082 | 0.053 | 14.3 | 51 | 429 | 1.7 | 0.27 | 1.6 | 0.113 | 54 | 633 | 9.6 | 48 | 5.9 | 21 | 3.9 | 2.2 | 1.01 |
| NCS DC73083 | 0.080 | 9.1 | 60 | 492 | 1.94 | 0.34 | 4.6 | 0.18 | 69 | 141 | 11.6 | 64 | 5.6 | 57 | 4.8 | 2.8 | 1.22 |
| NCS DC73084 | 0.071 | 12.8 | 49 | 513 | 2.07 | 0.33 | 3.8 | 0.156 | 68 | 66 | 13.5 | 70 | 8.0 | 25 | 4.7 | 2.7 | 1.2 |
| NCS DC73085 | 0.098 | 13.0 | 56 | 600 | 2.5 | 0.45 | 1.8 | 0.29 | 80 | 58 | 16.1 | 85 | 8.7 | 32.5 | 5.6 | 3.2 | 1.42 |
| NCS DC73086 | 0.074 | 11.0 | 62 | 509 | 2.0 | 0.36 | 3.6 | 0.104 | 76 | 41 | 15.0 | 90 | 6.9 | 25.4 | 5.4 | 3.1 | 1.28 |
| NCS DC73087 | 0.131 | 6.6 | 70 | 435 | 1.88 | 0.38 | 3.0 | 0.171 | 88 | 73 | 10.9 | 59 | 5.3 | 62 | 5.5 | 3.1 | 1.36 |
| NCS DC73088 | 0.122 | 5.0 | 65 | 570 | 2.38 | 0.45 | 1.8 | 0.28 | 81 | 65 | 15.1 | (448) | 9.6 | 31 | 5.5 | 3.1 | 1.41 |
| NCS DC73089 | 0.115 | 8.9 | 53 | 605 | 2.2 | 0.31 | 2.6 | 0.166 | 69 | 58 | 12.4 | 66 | 9.6 | 27.1 | 4.6 | 2.5 | 1.24 |
| NCS DC73090 | 0.077 | 3.9 | 41 | 585 | 2.1 | 0.29 | (1) | 0.131 | 75 | 55 | 14.4 | 63 | 6.2 | 26.2 | 4.3 | 2.46 | 1.19 |
| NCS DC73091 | 0.060 | 11.7 | 80 | 517 | 2.5 | 0.35 | 1.5 | 0.131 | 95 | (39) | 16.7 | 83 | 7.7 | 29.4 | 6.2 | 3.4 | 1.57 |
| NCS DC73092 | (0.028) | 5.4 | 14.8 | 652 | 2.6 | 0.28 | 2.8 | (0.03) | 121 | (33) | 5.4 | 31 | 11.6 | (5) | 3.0 | 1.57 | 1.16 |
| NCS DC73093 | 0.071 | 37 | 52 | 297 | 2.5 | 0.91 | (1.9) | 0.104 | 81 | (50) | 16.8 | 121 | 18.3 | 59 | 5.4 | 3.3 | 1.25 |
| NCS DC73094 | 0.087 | 7.5 | 88 | 285 | 4.7 | 0.62 | (0.8) | 0.36 | 95 | (30) | 21.9 | 95 | 10.3 | 37.2 | 7.9 | 4.6 | 1.87 |
| NCS DC73095 | 0.088 | 33 | 125 | 259 | 2.6 | 1.00 | 10.4 | 0.69 | 176 | (34) | 30.3 | 166 | 17.3 | 76 | 6.3 | 3.8 | 1.27 |
| NCS DC73096 | 0.041 | 3.8 | 13.4 | (74) | 1.89 | 2.1 | 2.9 | (0.035) | 90 | 49 | 8.8 | 37 | 4.0 | 16.0 | 1.7 | 0.94 | 0.49 |
| NCS DC73097 | (0.049) | 18.1 | 74 | 171 | 1.40 | 1.22 | (1.4) | 0.114 | 92 | 42 | 6 | 67 | 3.8 | 25.8 | 2.77 | 1.71 | 0.69 |
| NCS DC73098 | 0.128 | 35.6 | 144 | 615 | 3.0 | 0.86 | 2.7 | 0.30 | 94 | 64 | 17.6 | 118 | 12.4 | 41 | 6.0 | 3.2 | 1.55 |
| NCS DC73099 | 0.105 | 8.1 | 43 | 383 | 2.5 | 0.69 | 2.9 | 0.098 | 91 | 46 | 7 | 34 | 7.8 | 15.1 | 5.1 | 3.1 | 0.90 |
| NCS DC73100 | 0.076 | 5.4 | 74 | 457 | 1.66 | 0.35 | 1.4 | 0.17 | 73 | 62 | 5.0 | 27 | 6.2 | 18.3 | 6.2 | 3.6 | 1.08 |
| NCS DC73101 | 0.085 | 13.0 | 60 | 382 | 2.13 | 0.30 | (0.75) | 0.21 | 75 | 39 | 23.4 | (75) | 7.3 | 40 | 5.8 | 3.3 | 1.50 |
| NCS DC73102 | (0.042) | 7.7 | 12.8 | 376 | 1.8 | 0.18 | (1) | 0.042 | 74 | 46 | 13.4 | (20) | 7.2 | (8.9) | 8.0 | 4.6 | 1.60 |
| NCS DC73103 | 0.098 | 13.9 | 59 | 184 | 3.0 | 1.5 | 2.4 | 0.055 | 79 | (53) | 5.0 | 42 | 13.2 | (8) | 5.1 | (3.2) | 0.67 |
| NCS DC73104 | (0.028) | 3.5 | 37 | (47) | (0.4) | 0.35 | 4.4 | . | 17.6 | 34 | 1.79 | 31 | 2.7 | 9.5 | 1.39 | 0.9 | 0.19 |
| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cs | Cu | Dy | Er | Eu |

## CRM SOIL WITH EXTENSIVE ANALYSIS - CONTINUED ON THE NEXT PAGE

continued analysis listed in mg/kg 70 g units

| Number | F | Ga | Gd | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mn | Mo | N | Nb | Nd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73058 | 455 | 19.4 | 6.2 | 1.39 | 8.3 | 0.034 | 1.12 | 3.49 | 0.066 | 41 | 35.1 | 0.50 | 923 | 0.68 | 1799 | 16.3 | 37.0 |
| NCS DC73059 | 603 | 17.4 | 5.8 | 1.39 | 7.3 | 0.056 | 1.04 | 0.97 | 0.063 | 37 | 34.5 | 0.43 | 674 | 1.11 | 874 | 16.9 | 33.2 |
| NCS DC73060 | 3069 | 24 | 8.0 | 2.3 | 7.9 | 0.24 | 1.55 | 3.42 | 2.3 | 55 | 73.6 | 0.78 | 1675 | 12.2 | 1442 | 21.4 | 45.9 |
| NCS DC73061 | 577 | 15.2 | 6.0 | 1.50 | 8.3 | 0.075 | 1.04 | 2.93 | 0.080 | 42 | 26.1 | 0.44 | 119 | 3.2 | 1708 | 14.9 | 36.0 |
| NCS DC73062 | 690 | 15.4 | 5.8 | 1.29 | 7.4 | 0.081 | 1.04 | 2.30 | 0.056 | 38 | 35.8 | 0.45 | 666 | 0.98 | (1191) | 13.7 | 34.3 |
| NCS DC73063 | 954 | 17.1 | 5.5 | 1.15 | 5.5 | 0.015 | 1.03 | 1.59 | 0.062 | 36 | 42.6 | 0.44 | 721 | 1.32 | 606 | 15.5 | 31.8 |
| NCS DC73064 | 675 | 15.6 | 5.2 | 1.21 | 5.7 | 0.035 | 0.91 | 2.04 | 0.055 | 34 | 40.2 | 0.40 | 661 | 0.78 | 987 | 12.5 | 30.1 |
| NCS DC73065 | 530 | 12.8 | 3.9 | 1.20 | 4.0 | 0.027 | 0.72 | 1.33 | 0.044 | 26 | 24.8 | 0.32 | 590 | 0.72 | 840 | 10.0 | 23.1 |
| NCS DC73066 | 313 | 11.4 | 3.1 | 1.19 | 5.8 | 0.018 | 0.58 | 2.04 | 0.031 | 22 | 18.1 | 0.28 | 399 | 0.66 | 440 | 7.9 | 18.8 |
| NCS DC73067 | 603 | 21.7 | 5.8 | 1.26 | 7.4 | 0.055 | 0.94 | 1.9 | 0.061 | 44.6 | 50 | 0.41 | 0.107 | 2.08 | 0.247 | 16.7 | 38 |
| NCS DC73068 | 365 | 15.6 | 4.5 | 1.25 | 9.3 | 0.019 | 0.84 | 0.70 | 0.044 | 31.8 | 27 | 0.40 | 505 | 0.86 | 0.111 | 13.4 | 28.1 |
| NCS DC73069 | 357 | 17.5 | 4.5 | 1.33 | 5.6 | 0.024 | 0.85 | 2.33 | 0.052 | 31.5 | 25 | 0.40 | 700 | 0.5 | 692 | 12.9 | 27.1 |
| NCS DC73070 | (164) | 10.2 | 2.0 | 1.06 | 5.6 | 0.014 | 0.40 | 0.63 | 0.019 | 14.4 | 13.2 | 0.21 | 230 | 0.38 | 351 | 7.4 | 12.1 |
| NCS DC73071 | 750 | 17.5 | 4.9 | 1.29 | 4.1 | 0.031 | 0.90 | 2.0 | 0.063 | 34.0 | 39.3 | 0.40 | 879 | 1.92 | 592 | 12.8 | 29.2 |
| NCS DC73072 | 511 | 15.5 | 6.3 | 1.33 | 6.3 | 0.009 | 1.30 | 1.9 | 0.051 | 34 | 29 | 0.56 | 550 | 0.99 | 808 | 11.2 | 33.4 |
| NCS DC73073 | 589 | 17.4 | 5.2 | 1.28 | 4.9 | 0.012 | 1.09 | 1.7 | 0.061 | 30 | 31 | 0.52 | 800 | (1.1) | 637 | 12.0 | 28.2 |
| NCS DC73074 | 697 | 15.1 | 4.6 | 1.26 | 5.2 | 0.02 | 0.85 | 0.76 | 0.059 | 30 | 50 | 0.35 | 564 | 0.68 | 605 | 13.5 | 26.2 |
| NCS DC73075 | 617 | 14.4 | 4.5 | 1.15 | 4.9 | 0.029 | 0.85 | 1.08 | 0.050 | 30 | 38 | 0.36 | 592 | 0.86 | 552 | 12.1 | 25.6 |
| NCS DC73076 | 471 | 15.5 | 4.1 | 1.3 | 4.9 | 0.025 | 0.75 | 1.42 | 0.046 | 31 | 37 | 0.34 | 559 | 0.63 | (540) | 11.1 | 25 |
| NCS DC73077 | 613 | 12.1 | 3.4 | 1.15 | 4.0 | 0.028 | 0.62 | 2.6 | 0.039 | 26 | 40 | 0.28 | 532 | 0.42 | 639 | 10.0 | 21.3 |
| NCS DC73078 | 535 | 16.7 | 5.0 | 1.37 | 5.4 | 0.011 | 0.86 | 0.41 | 0.053 | 37.0 | 39 | 0.39 | 669 | 0.43 | 356 | 12.8 | 31.1 |
| NCS DC73079 | 403 | 15 | 5.2 | 1.48 | 5.2 | 0.015 | 0.76 | (0.44) | 0.048 | 38 | 46 | 0.29 | 496 | 0.53 | 366 | 12.0 | 33.8 |
| NCS DC73080 | 422 | 14.6 | 5.5 | 1.24 | 8.4 | 0.101 | 0.94 | 0.65 | 0.042 | 41 | 22.0 | 0.38 | 627 | 0.62 | 655 | 12.5 | 34.3 |
| NCS DC73081 | 526 | 13.4 | 4.4 | 1.20 | 5.2 | 0.018 | 0.82 | 0.90 | 0.049 | 28.8 | 25.2 | 0.38 | 626 | 0.85 | 276 | 11.1 | 25.5 |
| NCS DC73082 | 459 | 12.9 | 4.2 | 1.20 | 5.8 | 0.019 | 0.79 | 1.01 | 0.044 | 28 | 30 | 0.33 | 509 | 0.60 | 418 | 10.6 | 24.6 |
| NCS DC73083 | 537 | 14.8 | 5.3 | 1.32 | 8.4 | 0.069 | 0.97 | 1.9 | 0.051 | 36 | 33.8 | 0.44 | 572 | 0.79 | 0.146 | 14.3 | 32 |
| NCS DC73084 | 653 | 16.0 | 5.2 | 1.29 | 5.7 | 0.025 | 0.95 | 2.0 | 0.055 | 36 | 38 | 0.42 | 659 | (0.74) | 665 | 13.7 | 30.5 |
| NCS DC73085 | 622 | 18.3 | 6.2 | 1.47 | 7.0 | 0.161 | 1.12 | 0.95 | 0.065 | 42 | 43 | 0.48 | 701 | 0.79 | 1490 | 15.9 | 36.6 |
| NCS DC73086 | 431 | 15.1 | 5.7 | 1.42 | 9.8 | 0.049 | 1.08 | 1.5 | 0.051 | 39 | 31.8 | 0.48 | 878 | 0.50 | 666 | 15.7 | 33.6 |
| NCS DC73087 | 402 | 13.3 | 6.1 | 1.37 | 9.5 | 0.134 | 1.10 | 1.05 | (0.057) | 44 | 29.0 | 0.47 | 479 | 0.58 | 0.124 | 17.7 | 38 |
| NCS DC73088 | 649 | 20.5 | 5.8 | 1.50 | 7.0 | 0.19 | 1.11 | 0.56 | 0.077 | 41 | 57 | 0.49 | 519 | 0.66 | 0.239 | 16.4 | 36 |
| NCS DC73089 | 588 | 16.6 | 5.2 | 1.3 | 5.8 | 0.21 | 0.90 | 1.51 | 0.052 | 38 | 43 | 0.40 | 632 | 0.64 | 682 | 13.1 | 32 |
| NCS DC73090 | 531 | 18.0 | 4.9 | 1.39 | 7.0 | 0.044 | 0.87 | (0.61) | 0.054 | 40.0 | 35.6 | 0.39 | 749 | 0.32 | 591 | 15.1 | 31.8 |
| NCS DC73091 | 532 | 18.2 | 7.0 | 1.55 | 9.4 | 0.056 | 1.22 | 2.3 | 0.063 | 49 | 42.7 | 0.51 | 816 | 0.67 | 492 | 18.7 | 42 |
| NCS DC73092 | 540 | 30.9 | 5 .0 | 1.01 | 9.3 | 0.062 | 0.56 | 4.6 | 0.062 | 60 | 24.8 | 0.23 | 123 | 0.67 | (261) | 19.9 | 41.8 |
| NCS DC73093 | 909 | 32.3 | 5.8 | 2.1 | 5.7 | 0.33 | 1.12 | 2.2 | 0.122 | 49 | 96 | 0.54 | 318 | 3.2 | 762 | 19.3 | 38 |
| NCS DC73094 | 1250 | 29.1 | 8.4 | 2.22 | 5.1 | 0.069 | 1.6 | 0.7 | 0.106 | 57 | 106 | 0.68 | 919 | 0.43 | 696 | 21.4 | 45 |
| NCS DC73095 | 0.162 | 30.0 | 6.6 | 1.78 | 12.6 | 0.25 | 1.30 | 8.0 | 0.120 | 57 | 76 | 0.62 | 0.398 | 2.7 | 867 | 35 | 39 |
| NCS DC73096 | 212 | 21.7 | 2.4 | 1.6 | 8.6 | 0.053 | 0.35 | 5.3 | 0.069 | 21.3 | 23.8 | 0.17 | 189 | 7.3 | 309 | 23.2 | 16.2 |
| NCS DC73097 | 250 | 19.5 | 3.3 | 2.3 | (8.9) | 0.047 | 0.58 | 3.4 | 0.101 | 30.6 | 13.0 | 0.32 | 247 | 1.35 | 218 | 17.6 | 22.0 |
| NCS DC73098 | 635 | 21.9 | 6.9 | 1.47 | 7.8 | 0.060 | 1.16 | 1.25 | 0.089 | 47 | 33 | 0.44 | 648 | 1.01 | 0.146 | 20.6 | 40 |
| NCS DC73099 | 362 | 16.0 | 5.2 | 1.39 | 15.5 | 0.099 | 1.03 | 4.1 | 0.069 | 42 | 27.7 | 0.53 | 387 | 0.92 | 506 | 21.8 | 32.5 |
| NCS DC73100 | 254 | 11.2 | 5.8 | 1.59 | 14.7 | 0.038 | 1.26 | 0.56 | 0.048 | 38 | 14 | 0.59 | 311 | 0.38 | 960 | 17.2 | 31.6 |
| NCS DC73101 | 466 | 18.4 | 6.1 | 1.6 | 7.8 | 0.055 | 1.17 | 1.75 | 0.069 | 38 | 37 | 0.52 | 1230 | 0.44 | 555 | 17.7 | 34.3 |
| NCS DC73102 | 218 | 21.0 | 7.7 | 1.52 | (5.6) | 0.032 | 1.62 | 3.1 | 0.052 | 52 | 15.0 | 0.73 | 435 | 1.23 | (114) | 11.7 | 40.9 |
| NCS DC73103 | 485 | 25.2 | 5.0 | 1.83 | 10.8 | 0.100 | 1.1 | 2.9 | 0.093 | 46 | 45 | (0.55) | 116 | 1.84 | 267 | 35 | 31 |
| NCS DC73104 | 134 | 10.7 | 1.09 | 1.28 | 8.2 | 0.031 | 0.31 | 5.7 | 0.038 | 10.3 | 13.2 | 0.17 | (62) | 1.17 | 198 | 13.2 | 6.6 |
| Number | F | Ga | Gd | Ge | Hf | Hg | Ho | I | In | La | Li | Lu | Mn | Mo | N | Nb | Nd |

## CRM SOIL WITH EXTENSIVE ANALYSIS - CONTINUED ON THE NEXT PAGE

continued analysis listed in mg/kg 70 g units

| Number | Ni | P | Pb | Pr | Rb | Re | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS DC73058 | 31.0 | 752 | 26.6 | 9.6 | 124 | . | 0.80 | 12.6 | 0.36 | 7.1 | 3.4 | 186 | 1.26 | 1.00 | 0.049 | 13.6 | 0.73 |
| NCS DC73059 | 33.8 | 729 | 22.2 | 8.5 | 100 | . | 0.87 | 13.1 | 0.23 | 6.3 | 3.1 | 151 | 1.27 | 0.94 | (0.05) | 11.2 | 0.58 |
| NCS DC73060 | 22.3 | 806 | 727 | 12.5 | 206 | . | 18.2 | 11.4 | 1.3 | 9.0 | 411 | 26.3 | 2.63 | 1.34 | (1.6) | 23.9 | 2.13 |
| NCS DC73061 | 17.1 | 1249 | 27.0 | 9.4 | 94 | . | 1.1 | 11.1 | 1.2 | 6.6 | 6.0 | 80.1 | 1.26 | 0.93 | (0.05) | 13.9 | 0.81 |
| NCS DC73062 | 31.3 | 1278 | 25 | 8.7 | 101 | . | 1.16 | 11.8 | 0.19 | 6.5 | 3.0 | 203 | 1.12 | 0.93 | 0.039 | 13.0 | 0.59 |
| NCS DC73063 | 25.4 | 924 | 24.3 | 8.2 | 129 | . | 0.95 | 9.9 | 0.21 | 6.0 | 3.8 | 315 | 1.39 | 0.90 | 0.036 | 14.1 | 0.70 |
| NCS DC73064 | 31.7 | 1121 | 23.1 | 7.7 | 101 | . | 1.18 | 11.8 | 0.25 | 5.7 | 2.7 | 297 | 1.02 | 0.82 | (0.04) | 12.0 | 0.60 |
| NCS DC73065 | 38.4 | 718 | 19.5 | 6.0 | 86 | . | 1.01 | 10.7 | 0.26 | 4.4 | 2.1 | 221 | 0.85 | 0.63 | 0.032 | 9.8 | 0.50 |
| NCS DC73066 | 16.2 | 241 | 18.8 | 4.9 | 85 | . | 0.76 | 6.8 | 0.14 | 3.5 | 1.8 | 205 | 0.60 | 0.51 | 0.041 | 7.3 | 0.53 |
| NCS DC73067 | 16.8 | 990 | 26.4 | 10.0 | 130 | (0.003) | (0.5) | 10.8 | 0.137 | 6.8 | 2.9 | 252 | 1.3 | 0.87 | 0.039 | 14.5 | 0.82 |
| NCS DC73068 | 13.6 | 411 | 21.4 | 7.3 | 111 | (0.002) | (0.47) | 8.2 | 0.121 | 5.2 | 2.4 | 213 | 1.04 | 0.73 | 0.034 | 10.1 | 0.68 |
| NCS DC73069 | 21.5 | 499 | 23.1 | 7.0 | 122 | (0.002) | 0.58 | 9.6 | 0.152 | 5.1 | 2.7 | 155 | 1.03 | 0.72 | 0.038 | 10.5 | 0.74 |
| NCS DC73070 | 10.0 | 162 | 15.8 | 3.2 | 106 | (0.002) | 0.37 | 3.2 | 0.072 | 2.3 | 1.4 | 138 | 0.60 | 0.33 | (0.021) | 4.6 | 0.67 |
| NCS DC73071 | 63 | 559 | 25.0 | 7.5 | 110 | (0.004) | 1.58 | 15.6 | 0.42 | 5.5 | 2.7 | 308 | 0.99 | 0.78 | 0.052 | 12.5 | 0.68 |
| NCS DC73072 | 22.2 | 862 | 20.0 | 8.4 | 109 | (0.003) | 0.39 | 10.7 | 0.21 | 7.0 | 2.7 | 178 | 1.05 | 1.10 | (0.033) | 11.9 | 0.62 |
| NCS DC73073 | 27 | 885 | 20.2 | 7.1 | 94 | (0.002) | 1.00 | 14.0 | 0.29 | 5.6 | 2.4 | 285 | 0.93 | 0.89 | 0.049 | 9.7 | 0.56 |
| NCS DC73074 | 27.2 | 890 | 20.1 | 6.9 | 128 | (0.002) | 0.73 | 10.6 | 0.128 | 5.1 | 4.0 | 227 | 1.3 | 0.75 | 0.032 | 10.5 | 0.75 |
| NCS DC73075 | 28.2 | 671 | 20.3 | 6.7 | 100 | (0.002) | 1.39 | 10.7 | 0.16 | 5.0 | 2.7 | 259 | 0.98 | 0.75 | 0.036 | 10.4 | 0.63 |
| NCS DC73076 | 83 | 556 | 26.3 | 6.7 | 121 | (0.002) | 1.31 | 11.0 | 0.19 | 4.7 | 2.6 | 219 | 0.96 | 0.67 | 0.047 | 13.8 | 0.72 |
| NCS DC73077 | 36 | 432 | 18.0 | 5.5 | 93 | (0.002) | 0.80 | 8.6 | 0.11 | 4.0 | 1.9 | 477 | 0.75 | 0.55 | 0.040 | 9.0 | 0.52 |
| NCS DC73078 | 32.4 | 372 | 22.8 | 8.2 | 118 | (0.001) | 0.55 | 12.1 | 0.074 | 5.8 | 2.6 | 98 | 0.99 | 0.78 | 0.046 | 13.7 | 0.64 |
| NCS DC73079 | 41 | 491 | 24.9 | 8.7 | 101 | (0.002) | 2.6 | 10.1 | 0.118 | 6.3 | 2.6 | 141 | 0.89 | 0.77 | (0.054) | 11.1 | 0.57 |
| NCS DC73080 | 14.1 | 1100 | 25 | 9.2 | 110 | (0.002) | 0.33 | 8.2 | 0.087 | 6.3 | 2.8 | 214 | 1.08 | 0.86 | (0.028) | 16.0 | 0.64 |
| NCS DC73081 | 32.5 | 556 | 19.3 | 6.5 | 79 | (0.001) | 0.88 | 11.7 | 0.27 | 4.9 | 2.1 | 189 | 0.85 | (0.71) | 0.042 | 9.8 | 0.51 |
| NCS DC73082 | 23 | 612 | 18.7 | 6.5 | 82 | (0.004) | 1.8 | 9.2 | 0.107 | 4.8 | 2.3 | 233 | 0.81 | 0.68 | 0.038 | 9.0 | 0.51 |
| NCS DC73083 | 27.7 | (1580) | 25 | 8.3 | 86 | (0.002) | 0.90 | 10.8 | 0.38 | 6.0 | 4.6 | 174 | 1.08 | 0.85 | (0.038) | 11.4 | 0.53 |
| NCS DC73084 | 34 | 750 | 22 | 8.0 | 101 | (0.002) | 1.07 | 12.6 | 0.168 | 5.8 | 3.0 | 211 | 1.05 | 0.84 | 0.044 | 11.5 | 0.63 |
| NCS DC73085 | 38 | 876 | 33 | 9.5 | 115 | (0.003) | 1.19 | 13.9 | 0.25 | 7.0 | 4.0 | 162 | 1.20 | 1 | (0.049) | 13.8 | 0.70 |
| NCS DC73086 | 34.8 | 421 | 24.8 | 8.7 | 96 | (0.003) | 1.02 | 13.0 | 0.157 | 6.3 | 3.4 | 105 | 1.19 | 0.93 | (0.04) | 12.7 | 0.56 |
| NCS DC73087 | 23.0 | 584 | 71 | 9.8 | 78 | (0.002) | 4.3 | 9.6 | 0.30 | 6.9 | 12.1 | 111 | 1.31 | 0.96 | 0.040 | 13.0 | 0.50 |
| NCS DC73088 | 38 | 413 | 41 | 9.2 | 117 | (0.004) | 0.72 | 15.9 | 0.28 | 6.6 | 4.2 | 111 | 1.19 | 0.95 | 0.040 | 13.7 | 0.75 |
| NCS DC73089 | 36 | 693 | 24.4 | 8.3 | 102 | (0.003) | 0.70 | 10.6 | 0.099 | 5.9 | 2.5 | 130 | 1.00 | 0.81 | (0.042) | 12.3 | 0.63 |
| NCS DC73090 | 26.3 | 362 | 25.4 | 8.4 | 106 | (0.002) | 0.49 | 10.5 | 0.10 | 5.6 | 2.6 | 134 | 1.11 | 0.77 | (0.042) | 11.9 | 0.64 |
| NCS DC73091 | 37.1 | 542 | 24.4 | 11.0 | 109 | (0.003) | 1.06 | 13.6 | 0.165 | 7.8 | 3.5 | 94 | 1.4 | 1.09 | (0.046) | 15.7 | 0.64 |
| NCS DC73092 | 10.6 | (127) | 29.8 | 11.7 | 180 | (0.002) | 0.28 | 8.3 | 0.269 | 6.2 | 2.9 | (16) | 1.5 | 0.62 | 0.032 | 27.6 | 1.12 |
| NCS DC73093 | 80 | 578 | 42.6 | 10.0 | 134 | (0.001) | 2.3 | 21.7 | 0.34 | 6.5 | 5.1 | 37 | 1.6 | 0.93 | 0.11 | 22.8 | 1.09 |
| NCS DC73094 | 39.3 | 720 | 34 | 11.8 | 141 | (0.001) | 0.64 | 19.2 | 0.18 | 8.9 | 4.8 | 196 | 1.6 | 1.38 | (0.18) | 17.6 | 0.81 |
| NCS DC73095 | 60 | 720 | 71 | 10.7 | 128 | (0.001) | 1.86 | 21.9 | 0.28 | 6.9 | 6.2 | 58 | 2.6 | 1.06 | 0.10 | 26 | 1.18 |
| NCS DC73096 | 16.9 | 176 | 42 | 4.4 | 43 | (0.001) | 0.33 | 11.7 | 0.36 | 2.8 | 5.6 | (11.5) | 2.7 | 0.33 | 0.045 | 16.7 | 0.47 |
| NCS DC73097 | 15.5 | (319) | 56 | 5.9 | 43.1 | (0.003) | 1.2 | 13.9 | 0.53 | 3.8 | 4.1 | (17) | 1.4 | 0.49 | (0.07) | (20) | 0.44 |
| NCS DC73098 | 60 | 938 | 36.7 | 10.5 | 131 | (0.004) | 2.16 | 16.1 | 0.37 | 7.6 | 7.1 | 51 | 1.66 | 1.08 | 0.048 | 17.7 | 0.83 |
| NCS DC73099 | 10.7 | 440 | 39.5 | 8.8 | 149 | (0.002) | 0.42 | 7.9 | 0.19 | 6.0 | 9.3 | 49 | 2.2 | 0.87 | 0.032 | 21.7 | 0.94 |
| NCS DC73100 | 7.9 | 375 | 22.9 | 8.5 | 94 | (0.002) | 0.70 | 5.6 | 0.10 | 6.0 | 3.2 | 30 | 1.21 | 1.03 | (0.029) | 13.3 | 0.57 |
| NCS DC73101 | 37.5 | (180) | 21.0 | 8.7 | 94 | (0.003) | 1.3 | 15.6 | 0.21 | 6.6 | 3.0 | 60 | 1.28 | 0.99 | 0.052 | 12.1 | 0.56 |
| NCS DC73102 | 12.5 | (164) | 49 | 11.0 | 123 | (0.003) | 0.25 | 12.2 | 0.221 | 8.1 | 3.6 | (10) | 1.3 | 1.33 | 0.024 | 21.0 | 0.97 |
| NCS DC73103 | 13.6 | 177 | 46 | 8.7 | 135 | (0.003) | (0.87) | (9.1) | 0.57 | 5.6 | 11.0 | 28.5 | 3.9 | 0.85 | 0.047 | 37 | 1.11 |
| NCS DC73104 | 14.9 | 160 | 11.3 | 1.9 | 17.8 | (0.001) | (0.38) | (4.2) | (0.36) | 1.19 | 2.7 | (18.7) | 1.04 | 0.20 | 0.034 | 8.6 | (0.13) |
| Number | Ni | P | Pb | Pr | Rb | Re | Sb | Sc | Se | Sm | Sn | Sr | Ta | Tb | Te | Th | Tl |

**CRM SOIL WITH EXTENSIVE ANALYSIS - CONTINUED FROM THE PREVIOUS PAGE**

continued analysis listed in mg/kg 70 g units

| Number | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|
| NCS DC73058 | 0.51 | 3.1 | 95 | 2.1 | 29.9 | 3.2 | 75 | 306 |
| NCS DC73059 | 0.46 | 2.1 | 109 | 1.8 | 28.6 | 2.9 | 85 | 260 |
| NCS DC73060 | 0.75 | 15.6 | 79 | 164 | 43.7 | 5.1 | 514 | 257 |
| NCS DC73061 | 0.45 | 4.4 | 136 | 3.0 | 27.8 | 2.9 | 70 | 280 |
| NCS DC73062 | 0.47 | 2.6 | 83 | 2.1 | 27.7 | 3.0 | 78 | 264 |
| NCS DC73063 | 0.46 | 5.7 | 68 | 2.2 | 27.7 | 2.9 | 82 | 185 |
| NCS DC73064 | 0.40 | 2.8 | (82) | 1.9 | 25 | 2.6 | 72 | 201 |
| NCS DC73065 | 0.33 | 2.6 | 77 | 1.3 | 19.6 | 2.1 | 55 | 140 |
| NCS DC73066 | 0.27 | 1.4 | 54 | 1.4 | 15.8 | 1.8 | 35 | 201 |
| 2 | | | | | | | | |
| NCS DC73067 | 0.42 | 7.9 | 72 | 1.92 | 25.5 | 2.7 | 95 | 260 |
| NCS DC73068 | 0.39 | 3.0 | 51 | 1.7 | 22.8 | 2.6 | 53 | 330 |
| NCS DC73069 | 0.39 | 2.2 | 67 | 1.7 | 22.6 | 2.6 | 63 | 187 |
| NCS DC73070 | 0.20 | 0.97 | 28 | 0.64 | 12.4 | 1.32 | 21 | 206 |
| NCS DC73071 | 0.40 | 3.4 | 107 | 1.71 | 23.8 | 2.60 | 80 | 137 |
| NCS DC73072 | 0.57 | 12.5 | 59 | 2.7 | 34.9 | 3.7 | 53 | 200 |
| NCS DC73073 | 0.51 | 3.2 | 90 | 1.4 | 28.2 | 3.3 | 81 | 171 |
| NCS DC73074 | 0.37 | 3.3 | 66 | 2.5 | 23 | 2.3 | 65 | 180 |
| 3 | | | | | | | | |
| NCS DC73075 | 0.37 | 2.7 | 71 | 1.8 | 22.6 | 2.37 | 65 | 165 |
| NCS DC73076 | 0.34 | 2.3 | 75 | 2.0 | 20.4 | 2.18 | 64 | 169 |
| NCS DC73077 | 0.28 | 2.2 | 67 | 1.3 | 16.5 | 1.81 | 52 | 133 |
| NCS DC73078 | 0.39 | 1.94 | 99 | 1.5 | 22.6 | 2.52 | 76 | 184 |
| NCS DC73079 | 0.32 | 1.3 | 79 | 1.6 | 20.7 | 1.9 | 66 | 179 |
| NCS DC73080 | 0.40 | 2.6 | 57 | 1.99 | 25.7 | 2.6 | 67 | 264 |
| NCS DC73081 | 0.37 | 2.6 | 79 | 1.42 | 21.9 | 2.4 | 62 | 176 |
| NCS DC73082 | 0.34 | 2.1 | 60 | 1.8 | 21.5 | 2.19 | 57 | 201 |
| 4 | | | | | | | | |
| NCS DC73083 | 0.44 | 2.4 | 76 | 1.9 | 26.2 | 2.8 | 120 | 294 |
| NCS DC73084 | 0.42 | 2.5 | 84 | 1.84 | 25 | 2.7 | 71 | 191 |
| NCS DC73085 | 0.50 | 2.6 | 102 | 2.2 | 29.8 | 3.2 | 101 | 253 |
| NCS DC73086 | 0.49 | 2.5 | 92 | 2.1 | 29.3 | 3.1 | 56 | 348 |
| NCS DC73087 | 0.49 | 2.7 | 70 | 2.2 | 30.4 | 3.1 | 180 | 318 |
| NCS DC73088 | 0.50 | 3.5 | 118 | 1.9 | 30.1 | 3.2 | 111 | 250 |
| NCS DC73089 | 0.41 | 2.4 | 77 | 1.5 | 24 | 2.5 | 70 | 202 |
| NCS DC73090 | 0.38 | 2.1 | 81 | 1.6 | 23.6 | 2.5 | 75 | 249 |
| 5 | | | | | | | | |
| NCS DC73091 | 0.54 | 3.3 | 106 | 2.5 | 33.1 | 3.4 | 79 | 322 |
| NCS DC73092 | 0.24 | 2.9 | 76 | 3.3 | 16.2 | 1.50 | 78 | 302 |
| NCS DC73093 | 0.52 | 6.0 | 204 | 3.4 | 29.1 | 3.5 | 180 | 193 |
| NCS DC73094 | 0.71 | 3.3 | 131 | (2.7) | 46 | 4.5 | 137 | 171 |
| NCS DC73095 | 0.62 | 9.0 | 358 | 4.3 | 35.3 | 4.1 | 181 | 459 |
| NCS DC73096 | 0.16 | 5.1 | 72 | 5.7 | (9.8) | 1.06 | 39 | 253 |
| NCS DC73097 | 0.29 | 4.0 | 107 | 15.7 | 15 | 2.0 | 46 | 317 |
| NCS DC73098 | 0.48 | 4.0 | 132 | 3.3 | 31.5 | 3.0 | 102 | 265 |
| 6 | | | | | | | | |
| NCS DC73099 | 0.51 | 5.3 | 47 | 4.0 | 29 | 3.4 | 65 | 477 |
| NCS DC73100 | 0.58 | 3.2 | 37 | 2.2 | 35 | 3.8 | 59 | 50.5 |
| NCS DC73101 | 0.53 | 2.8 | (127) | 1.9 | 31.7 | 3.4 | 91 | 261 |
| NCS DC73102 | 0.73 | 8.4 | 60 | (0.84) | 44.0 | 4.8 | 51 | 154 |
| NCS DC73103 | 0.53 | 9.5 | 61 | 7.5 | 32 | 3.4 | 72 | 332 |
| NCS DC73104 | 0.16 | 1.45 | 39 | 1.64 | (9.9) | 1.09 | (19.4) | 278 |

| Number | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|

## CRM SOIL WITH EXTENSIVE ANALYSIS

analysis listed in mass % except * which is mg/kg 50 g units

| Number | $Al_2O_3$ | C | Org.C | CaO | F* | F(sol)* | $T.Fe_2O_3$ | $K_2O$ | MgO | Mn | N | $Na_2O$ | P | S | $SiO_2$ | Ti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71026 | 13.53 | 2.76 | 2.53 | 3.45 | 439 | 6.1 | 5.43 | 2.54 | 1.219 | 0.107 | 0.269 | 1.98 | 0.1074 | 0.0441 | 61.4 | 0.413 |
| NCS ZC71027 | 13.46 | 3.38 | 3.11 | 2.92 | 443 | 6.1 | 4.93 | 2.60 | 1.162 | 0.0963 | 0.285 | 1.99 | 0.1183 | 0.0429 | 61.7 | 0.390 |
| NCS ZC71028 | 13.63 | 3.54 | 3.19 | 2.00 | 429 | 6.9 | 4.20 | 2.72 | 1.061 | 0.0782 | 0.267 | 1.99 | 0.1175 | 0.0432 | 63.5 | 0.369 |
| NCS ZC71029 | 14.28 | 2.88 | 1.65 | 6.78 | 727 | 7.6 | 5.79 | 2.67 | 2.63 | 0.0873 | 0.184 | 1.18 | 0.155 | 0.0384 | 52.7 | 0.377 |
| NCS ZC71030 | 12.76 | 1.81 | 1.70 | 1.65 | 506 | 24 | 4.59 | 2.01 | 1.19 | 0.0872 | 0.117 | 1.53 | 0.0853 | 0.0524 | 68.43 | 0.380 |
| NCS ZC71031 | 13.19 | 0.68 | 0.66 | 0.94 | 466 | 10.2 | 3.57 | 2.98 | 0.707 | 0.0654 | 0.0683 | 2.04 | 0.0256 | 0.0390 | 71.58 | 0.264 |
| NCS ZC71032 | 10.87 | 1.11 | 0.92 | 4.52 | 625 | 8.8 | 7.83 | 2.54 | 1.80 | 0.101 | 0.0696 | 1.23 | 0.0959 | 1.33 | 61.4 | 0.273 |
| NCS ZC71033 | 13.57 | 2.69 | 1.74 | 4.98 | 640 | 14.1 | 4.81 | 2.25 | 2.08 | 0.0652 | 0.125 | 1.43 | 0.0765 | 0.0481 | 59.7 | 0.411 |
| NCS ZC71034 | 14.03 | 3.86 | 2.72 | 6.19 | 810 | 19.6 | 14.4 | 2.43 | 2.29 | 0.0717 | 0.246 | 0.70 | 0.212 | 0.0652 | 42.5 | 0.340 |
| NCS ZC71035 | 12.31 | 1.88 | 1.23 | 2.74 | 1020 | 6.6 | 6.11 | 2.88 | 2.86 | 0.118 | 0.122 | 1.21 | 0.0887 | 0.0576 | 62.3 | 0.443 |
| NCS ZC71036 | 12.19 | 1.15 | 1.13 | 1.61 | 558 | 9.1 | 5.05 | 2.56 | 1.48 | 0.0690 | 0.113 | 1.86 | 0.0933 | 0.0499 | 69.1 | 0.389 |
| NCS ZC71037 | 13.69 | 2.43 | 2.21 | 1.81 | 603 | 5.7 | 5.73 | 2.33 | 1.73 | 0.0909 | 0.233 | 1.12 | 0.227 | 0.0566 | 62.6 | 0.424 |

continued analysis in mg/kg

| Number | Ag | As | B | Ba | Be | Bi | Br | Cd | Ce | Cl | Co | Cr | Cu | Dy | Er | Eu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71026 | 0.78 | 503 | 52 | 600 | 2.30 | 4.37 | 4.9 | 2.61 | 64.2 | 83 | 12.0 | 55 | 128 | 5.1 | 2.90 | 1.39 |
| NCS ZC71027 | 0.53 | 323 | 43 | 619 | 2.31 | 2.84 | 4.9 | 1.62 | 66 | 88 | 11.7 | 54.1 | 88 | 4.62 | 2.61 | 1.26 |
| NCS ZC71028 | 0.20 | 89 | 32 | 658 | 2.51 | 0.97 | 4.60 | 0.53 | 68 | 77 | 11.2 | 55 | 37.5 | 4.39 | 2.51 | 1.18 |
| NCS ZC71029 | 0.094 | 17.4 | 55 | 538 | 2.42 | 0.483 | 10.2 | 0.66 | 73 | 161 | 16.5 | 79 | 37.0 | 5.21 | 2.95 | 1.37 |
| NCS ZC71030 | 0.131 | 10.3 | 62 | 924 | 2.28 | 0.50 | 7.1 | 6.48 | 73 | 99 | 50.8 | 79 | 30.0 | 5.00 | 2.88 | 1.33 |
| NCS ZC71031 | 2.11 | 8.4 | 27.0 | 978 | 1.96 | 1.19 | 4.2 | 0.50 | 49 | 85 | 8.2 | 54 | 30.1 | 3.25 | 1.96 | 0.98 |
| NCS ZC71032 | 7.7 | 71.3 | 38 | 654 | 1.52 | 11.0 | 2.3 | 16.5 | 45.8 | 100 | 25.6 | 55.6 | 358 | 3.11 | 1.78 | 1.00 |
| NCS ZC71033 | 0.098 | 13.5 | 65.8 | 477 | 2.37 | 0.427 | 6.7 | 0.218 | 78 | 91 | 13.38 | 69.1 | 25.9 | 5.3 | 3.04 | 1.32 |
| NCS ZC71034 | 0.129 | 18.6 | 47 | 517 | 2.30 | 0.511 | 4.2 | 0.319 | 72 | 137 | 15.8 | 2520 | 70 | 5.02 | 2.83 | 1.32 |
| NCS ZC71035 | 0.42 | 11.9 | 48 | 1820 | 2.99 | 4.0 | 2.32 | 0.68 | 235 | 55 | 16.6 | 75 | 47 | 6.5 | 3.64 | 2.62 |
| NCS ZC71036 | 1.11 | 9.48 | 45 | 1277 | 1.88 | 2.52 | 3.1 | 1.11 | 85 | 73 | 14.2 | 67 | 130 | 4.71 | 2.67 | 1.40 |
| NCS ZC71037 | 1.39 | 27.2 | 61 | 556 | 2.43 | 2.58 | 2.63 | 13.3 | 80 | 63 | 17.3 | 121 | 106 | 5.6 | 3.19 | 1.40 |

| Number | Ga | Gd | Ge | Hg | Ho | I | La | Li | Lu | Mo | Nb | Nd | Ni | Pb | Pr | Rb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71026 | 17.0 | 5.35 | 1.65 | 0.058 | 1.04 | 3.09 | 36.6 | 28.5 | 0.46 | 2.01 | 13.6 | 32.9 | 20.7 | 34.9 | 8.6 | 102 |
| NCS ZC71027 | 17.3 | 4.88 | 1.61 | 0.10 | 0.92 | 2.65 | 35.4 | 29.0 | 0.414 | 1.82 | 13.4 | 30.6 | 20.5 | 33.2 | 8.0 | 103 |
| NCS ZC71028 | 17.6 | 4.7 | 1.39 | 0.14 | 0.88 | 2.6 | 34.2 | 30.6 | 0.408 | 1.25 | 13.5 | 29.6 | 21.1 | 30.7 | 7.9 | 105 |
| NCS ZC71029 | 18.8 | 5.6 | 1.35 | 0.031 | 1.04 | 3.0 | 38.8 | 46.9 | 0.45 | 0.84 | 13.4 | 33.6 | 41.1 | 30.8 | 8.9 | 121 |
| NCS ZC71030 | 15.6 | 5.66 | 1.57 | 0.072 | 1.00 | 3.3 | 36.5 | 41.3 | 0.459 | 1.05 | 13.3 | 31.8 | 40.7 | 190 | 11.6 | 84 |
| NCS ZC71031 | 16.5 | 3.4 | 1.31 | 2.50 | 0.69 | 2.49 | 25.2 | 22.7 | 0.331 | 0.71 | 10.8 | 21.3 | 18.5 | 179 | 5.73 | 103 |
| NCS ZC71032 | 14.9 | 3.47 | 1.89 | 6.36 | 0.62 | 0.94 | 23.8 | 29.4 | 0.264 | 14.0 | 8.6 | 21.9 | 30.0 | 538 | 5.63 | 102 |
| NCS ZC71033 | 17.5 | 5.6 | 1.48 | 0.070 | 1.06 | 2.93 | 40.9 | 46.1 | 0.457 | 1.12 | 15.2 | 34.1 | 32.6 | 28.0 | 9.1 | 96 |
| NCS ZC71034 | 21.7 | 5.5 | 2.33 | 0.121 | 1.00 | 2.0 | 38.2 | 46.5 | 0.42 | 12.5 | 12.3 | 33.6 | 236 | 34.4 | 8.8 | 106 |
| NCS ZC71035 | 18.2 | 9.9 | 1.50 | 0.120 | 1.26 | 1.37 | 150 | 38.1 | 0.52 | 43 | 19.6 | 84 | 32.3 | 265 | 24.9 | 121 |
| NCS ZC71036 | 15.7 | 5.3 | 1.34 | 6.3 | 0.96 | 1.61 | 49 | 28.7 | 0.410 | 19.2 | 13.3 | 35.9 | 26.8 | 637 | 9.9 | 99 |
| NCS ZC71037 | 18.1 | 6.0 | 1.53 | 1.29 | 1.11 | 1.78 | 41 | 47.0 | 0.47 | 1.35 | 15.3 | 35.1 | 40.7 | 287 | 9.3 | 116 |

| Number | Sb | Sc | Se | Sm | Sn | Sr | Tb | Th | Tl | Tm | U | V | W | Y | Yb | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NCS ZC71026 | 1.34 | 10.6 | 0.36 | 6.27 | 11.4 | 192 | 0.89 | 10.7 | 0.62 | 0.45 | 2.69 | 74 | 5.9 | 27.9 | 2.91 | 353 | 272 |
| NCS ZC71027 | 1.18 | 9.7 | 0.29 | 5.81 | 9.9 | 202 | 0.8 | 10.8 | 0.65 | 0.407 | 2.65 | 70 | 4.6 | 25.3 | 2.64 | 236 | 270 |
| NCS ZC71028 | 1.04 | 9.4 | 0.23 | 5.6 | 4.9 | 216 | 0.76 | 11.0 | 0.692 | 0.39 | 2.52 | 69 | 2.60 | 23.8 | 2.50 | 133 | 273 |
| NCS ZC71029 | 1.49 | 14.5 | 0.297 | 6.5 | 3.39 | 184 | 0.92 | 14.4 | 0.77 | 0.447 | 2.6 | 101 | 2.10 | 27.8 | 2.84 | 108 | 180 |
| NCS ZC71030 | 1.24 | 10.7 | 1.47 | 6.06 | 26.4 | 208 | 0.88 | 11.6 | 0.59 | 0.451 | 2.47 | 87 | 1.72 | 26.8 | 2.88 | 312 | 837 |
| NCS ZC71031 | 0.66 | 7.6 | 0.26 | 3.96 | 2.61 | 232 | 0.56 | 7.6 | 0.57 | 0.325 | 1.73 | 54.6 | 2.15 | 18.3 | 2.10 | 96 | 229 |
| NCS ZC71032 | 6.0 | 9.1 | 0.46 | 4.10 | 3.25 | 166 | 0.557 | 6.2 | 0.97 | 0.267 | 2.24 | 71.9 | 44 | 17.0 | 1.73 | 2310 | 123 |
| NCS ZC71033 | 1.10 | 12.8 | 0.606 | 6.5 | 3.33 | 181 | 0.92 | 13.4 | 0.62 | 0.464 | 0.273 | 88.5 | 1.97 | 28.8 | 2.92 | 77.0 | 234 |
| NCS ZC71034 | 1.91 | 14.3 | 1.07 | 6.4 | 4.5 | 140 | 0.88 | 13.7 | 0.702 | 0.43 | 4.99 | 106 | 4.32 | 26.9 | 2.81 | 128 | 136 |
| NCS ZC71035 | 1.42 | 13.0 | 0.272 | 11.7 | 3.5 | 232 | 1.26 | 12.5 | 0.88 | 0.54 | 4.3 | 100 | 10.8 | 33.7 | 3.45 | 158 | 216 |
| NCS ZC71036 | 1.33 | 11.5 | 0.36 | 6.3 | 2.78 | 317 | 0.83 | 13.1 | 0.59 | 0.415 | 2.25 | 82 | 33.8 | 25.5 | 2.55 | 217 | 276 |
| NCS ZC71037 | 6.7 | 13.7 | 0.52 | 6.8 | 4.81 | 117 | 0.96 | 14.3 | 0.88 | 0.48 | 2.57 | 97 | 4.0 | 30.4 | 3.05 | 707 | 245 |