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INVENTORY OF TRACE ELEMENTS IN WATER  
MATRIX REFERENCE MATERIALS

Measurand	TM-07 lot 1123		TM-9.3 lot 1024		TM-23.5 lot 0524		TM-24.5 lot 1024		TM-26.5 lot 1024		TM-40.1 lot 0524	TM-40.1 lot 0524
	Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L	Value in µg/L
Aluminum			33.5 ± 3.5		95.9 ± 9.3		32.9 ± 3.9		73.6 ± 6.1		40.8 ± 4.6	104 ± 11
Antimony	2.21 ± 0.17		4.57 ± 0.43		3.44 ± 0.27		3.46 ± 0.34		2.92 ± 0.26		39.7 ± 4.2	15.3 ± 1.22
Arsenic	10.5 ± 0.8		20.9 ± 1.9		8.06 ± 0.70		5.75 ± 0.60		9.09 ± 0.79		40.5 ± 3.7	18.2 ± 1.6
Barium	28.4 ± 1.8		56.3 ± 3.9		14.0 ± 1.0		14.9 ± 1.2		26.7 ± 1.7		48.9 ± 3.2	72.4 ± 4.7
Beryllium	3.08 ± 0.34		6.02 ± 0.56		2.13 ± 0.24		2.07 ± 0.20		3.50 ± 0.32		47.5 ± 4.7	10.2 ± 1.2
Bismuth			1.41 ± 0.20		3.03 ± 0.53				2.89 ± 0.39		31.4 ± 6.9	
Boron			27.5 ± 4.4		17.5 ± 2.7		15.8 ± 2.6				48.3 ± 6.1	47.3 ± 5.7
Cadmium	1.92 ± 0.13		5.00 ± 0.36		2.98 ± 0.26		3.93 ± 0.30		7.14 ± 0.45		42.8 ± 3.3	25.4 ± 1.5
Chromium	1.99 ± 0.18		3.94 ± 0.32		7.12 ± 0.48		4.96 ± 0.34		12.3 ± 0.8		39.3 ± 2.6	63.8 ± 4.3
Cobalt	0.98 ± 0.08		2.00 ± 0.13		7.36 ± 0.54		5.87 ± 0.38		8.12 ± 0.48		41.4 ± 3.1	56.4 ± 4.3
Copper	15.8 ± 1.5		32.6 ± 2.2		7.68 ± 0.70		6.27 ± 0.53		14.1 ± 1.1		45.9 ± 3.6	74.4 ± 5.9
Gallium	1.43 ± 0.13		2.82 ± 0.21		0.910 ± 0.061		3.2 ± 0.218		5.45 ± 0.34			9.89 ± 0.98
Iron	56.2 ± 5.1		108 ± 9				16.1 ± 2.0				81.2 ± 6.7	106 ± 8
Lead	4.03 ± 0.34		8.40 ± 0.73		2.96 ± 0.27		5.32 ± 0.50		10.2 ± 0.9		35.6 ± 2.7	60.7 ± 4.0
Lithium			4.29 ± 0.51		9.99 ± 0.86						37.4 ± 3.4	
Manganese	4.95 ± 0.42		9.95 ± 0.65		8.41 ± 0.64		8.44 ± 0.61				42.7 ± 2.9	79.7 ± 5.9
Molybdenum	6.3 ± 0.6		12.8 ± 0.9		4.17 ± 0.39		6.31 ± 0.52		7.95 ± 0.65		42.6 ± 2.9	55.2 ± 4.8
Nickel	9.3 ± 0.7		18.7 ± 1.1		5.00 ± 0.45		4.93 ± 0.38		11.0 ± 0.7		43.1 ± 3.3	63.8 ± 4.8
Rubidium	2.22 ± 0.14				0.734 ± 0.069		3.68 ± 0.25		10.6 ± 0.5		1.45 ± 0.11	16.1 ± 1.0
Selenium	7.9 ± 0.8				4.95 ± 0.72		3.64 ± 0.44		5.64 ± 0.60		41.7 ± 4.9	14.6 ± 1.6
Silver	1.9 ± 0.2								6.89 ± 0.46		21.3 ± 2.2	11.1 ± 1.0
Strontium	115 ± 9		115 ± 9		114 ± 7		115 ± 8		120 ± 9		69.7 ± 4.8	114 ± 9
Thallium	1.01 ± 0.08		1.98 ± 0.16		4.08 ± 0.32		4.11 ± 0.34		5.43 ± 0.42		44.6 ± 3.4	18.3 ± 1.3
Tin	1.43 ± 0.16		2.93 ± 0.26		2.83 ± 0.29		3.64 ± 0.37		5.89 ± 0.50		38.5 ± 3.1	16.2 ± 1.3
Titanium	3.88 ± 0.34		8.08 ± 0.59		3.33 ± 0.36		7.19 ± 0.50		6.27 ± 0.54			13.9 ± 1.0
Tungsten					4.07 ± 0.53				3.57 ± 0.412			
Uranium	0.95 ± 0.08		1.84 ± 0.16		5.01 ± 0.37		4.20 ± 0.29		7.34 ± 0.48		39.5 ± 2.6	28.6 ± 1.9
Vanadium	1.60 ± 0.24		3.00 ± 0.27		0.326 ± 0.080		7.15 ± 0.52		13.5 ± 0.8		42 ± 3.0	46.8 ± 3.7
Zinc	28.5 ± 3.0		50.6 ± 5.0								100 ± 10	

\*denotes a measurand which was removed from the previous lot #

\*denotes a new lot #, new RM or newly added measurand

Measurand	TM-40.1 lot 1123		TM-40.1 lot 0524		TM-40.1 lot 1024		TM-40.1 lot 1024		TM-40.1 lot 1024		TM-40.1 lot 1024		TM-40.1 lot 0524	
	Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L		Value in µg/L	
Aluminum			389 ± 30		60.0 ± 6.4		117 ± 9		289 ± 24		419 ± 37		56.8 ± 5.5	
Antimony	16.4 ± 1.3				34.7 ± 3.0		60.1 ± 4.6		123 ± 10		23.4 ± 2.1		3.37 ± 0.33	
Arsenic	25.1 ± 1.9		45.1 ± 3.4		35.8 ± 2.9		57.4 ± 4.7		167 ± 15		48.4 ± 4.2		4.77 ± 0.42	
Barium	138 ± 9		324 ± 22		64.0 ± 4.8		115 ± 7		284 ± 18		317 ± 19		147 ± 10	
Beryllium	16.9 ± 1.9		17.2 ± 1.6		37.9 ± 4.6		54.5 ± 4.9		157 ± 17		16.4 ± 1.6		14.0 ± 1.3	
Bismuth	10.2 ± 1.6				19.3 ± 2.2				112 ± 12		12.6 ± 1.7			
Boron	12.4 ± 1.9		59.1 ± 6.6		45.6 ± 4.9		114 ± 13				39.2 ± 4.9		79.8 ± 7.9	
Cadmium	83.2 ± 5.3		156 ± 9		58.2 ± 4.0		92.0 ± 5.0		256 ± 14		138 ± 8		4.82 ± 0.39	
Chromium	156 ± 11		420 ± 26		68.4 ± 4.2		90.9 ± 5.5		273 ± 18		389 ± 26		44.3 ± 2.8	
Cobalt	124 ± 9		304 ± 21		62.3 ± 3.3		92.2 ± 6.6		252 ± 16		280 ± 19		51.4 ± 3.5	
Copper	179 ± 12		393 ± 30		57.7 ± 4.6		87.2 ± 5.7		251 ± 16		389 ± 29		163 ± 11	
Gallium	13.6 ± 1.1		12.5 ± 0.9		8.50 ± 0.73		32.1 ± 1.6		49.4 ± 3.2					
Iron	334 ± 23		368 ± 22		78.1 ± 5.8		113 ± 8		292 ± 21		369 ± 26		225 ± 14	
Lead	332 ± 27		491 ± 39		54.8 ± 3.7		94.1 ± 6.4		277 ± 21		440 ± 35		6.85 ± 0.54	
Lithium			21.4 ± 2.0		35.3 ± 5.0		57.8 ± 6.5						20.2 ± 1.9	
Manganese	191 ± 12		274 ± 15		75.0 ± 4.7		91.6 ± 5.9		288 ± 17		312 ± 20		47.3 ± 3.2	
Molybdenum	196 ± 14		293 ± 22		73.0 ± 5.6		98.6 ± 6.4		281 ± 21		261 ± 19		65.9 ± 4.3	
Nickel	260 ± 20		323 ± 20		55.6 ± 3.7		92.7 ± 6.3		246 ± 15		326 ± 22		83.1 ± 5.1	
Rubidium	15.8 ± 0.9		14.2 ± 0.9		3.31 ± 0.20		15.7 ± 0.9		29.1 ± 1.7		0.663 ± 0.084		0.462 ± 0.071	
Selenium	22.4 ± 1.9		34.8 ± 3.4				53.1 ± 4.5		158 ± 13		28.6 ± 2.5			
Silver			12.9 ± 1.1		11.4 ± 1.0						8.56 ± 0.66		9.59 ± 0.76	
Strontium	272 ± 18		574 ± 39		114 ± 9		145 ± 10		622 ± 44		445 ± 29		240 ± 17	
Thallium	18.0 ± 1.1		28.2 ± 2.2				51.0 ± 3.4		144 ± 10		21.4 ± 1.44		8.43 ± 0.66	
Tin	18.9 ± 1.3		45.3 ± 3.3		56.8 ± 5.3		105 ± 8		281 ± 24					
Titanium	110 ± 8		32.8 ± 2.8		37.0 ± 2.5		56.7 ± 3.5		121 ± 8					
Tungsten			8.47 ± 1.23				1.03 ± 0.20							
Uranium	21.5 ± 1.5		56.8 ± 4.2		35.1 ± 2.9		54.2 ± 3.6		132 ± 11		60.0 ± 3.8		14.5 ± 1.0	
Vanadium	135 ± 10		341 ± 22		71.0 ± 6.0		112 ± 7		280 ± 19		313 ± 20		45.5 ± 2.9	
Zinc	273 ± 23		540 ± 37		75.0 ± 7.2		121 ± 11		329 ± 25		502 ± 40		393 ± 28	

All values are in µg/L, unless otherwise specified. Values and pricing subject to changes.

