Contents

CRM: A reference material characterized by a metrologically valid procedure for one or more specified properties, accompanied by a reference material certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability.

A complete listing of ERA's CRMs can be found on our Scope of Accreditation for general requirements for competence of reference material producers available at www.eraqc.com/AboutERA/Accreditations.

PT: A Proficiency Test (PT) is an analysis of what is often referred to as a blind sample or a sample with unknown concentrations of analytes for the purpose of evaluating a laboratory's analytical performance.

QR: Similar to a Proficiency Test, a QuiK Response (QR) is a sample with unknown concentrations. However, unlike a scheduled PT, QR is on-demand and available at any time. Plus, your results are returned within two business days. QuiK Response can be used as a bilateral PT as referenced in the IUPAC/CITAC guide: Selection and use of PT schemes for a limited number of participants – chemical analytical labs.

RM: A material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process.

Description	CRM/ RM	PT	QR	Page
Aldehydes and Ketones on Sorbent	1114	1014 Q	1114QR	55
Ammonia in Impinger Solution	1145	1045 Q	1145QR	57
Chromium on Filter Paper	1131	1031 Q	1131QR	56
Fluoride in Impinger Solution	1141	1041 Q	1141QR	57
Hexavalent Chromium in Impinger Solution	1132	1032 Q	1132QR	56
Hydrogen Halides & Halogens in Impinger Solution	1140	1040 Q	1140QR	57
Lead in Impinger Solution	1130	1030 Q	1130QR	56
Lead on Filter Paper	1129	1029 Q	1129QR	56
Mercury in Impinger Solution	1128	1028 Q	1128QR	56
Mercury on Filter Paper	1127	1027 Q	1127QR	56
Metals on Filter Paper	1125	1025 Q	1125QR	56
Metas in Impinger Solution	1126	1026 Q	1126QR	56
Nitrogen Oxide in Impinger Solution	1142	1042 Q	1142QR	57
Organochlorine Pesticides on Polyurethane Foam	1111	1011 Q	1111QR	55
PAHs on Polyurethane Foam	1113	1013 Q	1113QR	55
Particulate Matter in Impinger Solution	1151	1051 Q	1151QR	57
Particulate Matter on Filter Paper	1150	1050 Q	1150QR	57
PCBs on Polyurethane Foam	1112	1012 Q	1112QR	55
Semivolatiles on Polyurethane Foam	1110	1010 Q	1110QR	55
Sulfur Dioxide in Impinger Solution	1143	1043 Q	1143QR	57
Sulfuric Acid & Sulfur Dioxide in Impinger Solution	1144	1044 Q	1144QR	57
Volatiles in Gas Cylinder	1100	1000 Q	1100QR	54
Volatiles on Sorbent	1101	1001 Q	1101QR	54

Q All Waters ERA Air & Emissions PTs open quarterly. Quarterly months are January, April, July, and October.

Volatiles

Volatiles in Gas Cylinder*

RM**	PT	QR
Cat. #1100	Cat. #1000 Q	Cat. #1100QR

One pressurized gas cylinder containing 87 L of gas at 1500 psig (103 bar) for use with EPA methods TO-14, TO-15, or other applicable methods. Contains at least 10 analytes, randomly selected from the list below, at 2–50 ppbv (4–100 ppbv) for Total Xylenes.

- Acetone
- Benzene
- Benzy chloride
- Bromodichloromethane
- Bromoform
- Bromomethane
- 1,3-Butadiene
- 2-Butanone (MEK)
- Methyl tert-butyl ether (MTBE)
- Carbon disulfide
- Carbon tetrachloride
- Chlorobenzene
- Chlorodibromomethane
- Chloroethane
- Chloroform
- Chloromethane
- Cyclohexane
- 1,2-Dibromoethane (EDB)
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Dichlorodifluoromethane (Freon 12)
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- 1,1-Dichloroethylene
- cis-1,2-Dichloroethylene
- trans-1,2-Dichloroethylene
- 1,2-Dichloropropane
- cis-1,3-Dichloropropylene
- trans-1,3-Dichloropropylene
- 1,2-Dichlorotetrafluoroethane (Freon 114)
- Ethyl acetate
- Ethylbenzene
- p-Ethyltoluene
- n-Heptane
- Hexachlorobutadiene
- n-Hexane
- 2-Hexanone
- Isopropyl alcohol
- Methylene chloride
- Methyl methacrylate
- 4-Methyl-2-pentanone (MIBK)
- Methyl tert-butyl ether (MTBE)
- Propylene
- Styrene
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethylene
- Toluene
- Trichloroethene
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichlorofluoromethane (Freon 11)
- Trichlorotrifluoromethane (Freon 113)
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- Vinyl bromide
- Vinyl chloride
- Xylenes, total
- m&p-Xylene
- o-Xylene

*Volatiles in Gas Cylinder ships as dangerous goods.

** Reference Material (RM)

Volatiles on Sorbent

CRM	PT	QR
Cat. #1101	Cat. #1001 Q	Cat. #1101QR

One 2 mL flame-sealed ampule for spiking client-specific sorbent. Use with EPA Methods TO-17, 0030, 0031, or other applicable methods. Contains at least 24 analytes, randomly selected from the list below, at 50–2000 ng/sample (200–3000 ng/sample for Total Xylenes) after preparation.

- Acetone
- Acetonitrile
- Acrolein
- Acrylonitrile
- Benzene
- Bromobenzene
- Bromochloromethane
- Bromodichloromethane
- Bromoform
- Bromomethane
- 2-Butanone (MEK)
- n-Butylbenzene
- sec-Butylbenzene
- tert-Butylbenzene
- Carbon disulfide
- Carbon tetrachloride
- Chlorobenzene
- Chlorodibromomethane
- Chloroethane
- 2-Chloroethyl vinyl ether
- Chloroform
- Chloromethane
- 2-Chlorotoluene
- 4-Chlorotoluene
- 1,3-Dichloropropane
- 2,2-Dichloropropane
- 1,1-Dichloropropene
- 1,2-Dibromo-3-chloropropane (DBCP)
- 1,2-Dibromoethane (EDB)
- Dibromomethane
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Dichlorodifluoromethane (Freon 12)
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- 1,2-Dichloropropane
- cis-1,3-Dichloropropene
- trans-1,3-Dichloropropene
- Ethylbenzene
- Hexachlorobutadiene
- Hexachloroethane
- 2-Hexanone
- Isopropylbenzene
- 4-Isopropyltoluene
- Methyl tert-butyl ether (MTBE)
- Methylene chloride
- 4-Methyl-2-pentanone (MIBK)
- Naphthalene
- Nitrobenzene
- n-Propylbenzene
- Styrene
- 1,1,1,2-Tetrachloroethane
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethene
- Toluene
- 1,2,3-Trichlorobenzene
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethlyene
- Trichlorofluoromethane
- 1,2,3-Trichloropropane
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- Vinyl acetate
- Vinyl chloride
- Xylenes, total
- m&p-Xylene
- o-Xylene

Semivolatiles

Semivolatiles on Polyurethane Foam

CRM	PT	QR
Cat. #1110	Cat. #1010 Q	Cat. #1110QR

Two 2 mL flame-sealed ampules plus one polyurethane foam. Use with EPA Method 0010, or other applicable methods. Contains at least 42 analytes, randomly selected from the list below, at 10–225 µg/sample (200–1000 µg/sample for Benzidine) after preparation.

- Acenaphthene
- Acenaphthylene
- Aniline
- Anthracene
- Benzidine
- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(a)pyrene
- Benzyl alcohol
- 4-Bromophenyl phenyl ether
- Butyl benzyl phthalate
- Carbazole
- 4-Chloroaniline
- Bis(2-chloroethoxy)methane
- Bis(2-chloroethyl)ether
- Bis(2-ethylhexyl)phthalate
- 1-Chloronaphthalene
- 2-Chloronaphthalene
- 4-Chlorophenyl phenyl ether
- Chrysene
- Dibenz(a,h)anthracene
- Dibenzofuran
- Di-n-butyl phthalate
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- 3,3'-Dichlorobenzidine
- Diethyl phthalate
- Dimethyl phthalate
- 2,4-Dinitrotoluene
- 2,6-Dinitrotoluene
- Di-n-octyl phthalate
- Fluoranthene
- Fluorene
- Hexachlorobenzene
- Hexachlorobutadiene
- Hexachlorocyclopentadiene
- Hexachloroethane
- Indeno(1,2,3-cd)pyrene
- Isophorone
- 2-Methylnaphthalene
- Naphthalene
- 2-Nitroaniline
- 3-Nitroaniline
- 4-Nitroaniline
- Nitrobenzene
- N-Nitrosodiethylamine
- N-Nitrosodimethylamine (NDMA)
- N-Nitrosodiphenylamine
- N-Nitroso-di-n-propylamine
- 2,2'-Oxybis(1-chloropropane)
- Pentachlorobenzene
- Phenanthrene
- Pyrene
- Pyridine
- o-Toluidine
- 1,2,4,5-Tetrachlorobenzene
- 1,2,4-Trichlorobenzene
- Benzoic Acid
- 4-Chloro-3-methylphenol
- 2-Chlorophenol
- 2,4-Dichlorophenol
- 2,6-Dichlorophenol
- 2,4-Dimethylphenol
- 2,4-Dinitrophenol
- 2-Methyl-4,6-dinitrophenol
- 2-Methylphenol (o-Cresol)
- 4-Methylphenol (p-Cresol)
- 2-Nitrophenol
- 4-Nitrophenol
- Pentachlorophenol
- Phenol
- 2,3,4,6-Tetrachlorophenol
- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol

Organochlorine Pesticides on Polyurethane Foam

CRM	PT	QR
Cat. #1111	Cat. #1011 Q	Cat. #1111QR

One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Methods TO-04A, TO-10A, or other applicable methods. Contains at least 16 analytes, randomly selected from the list below, at 1–20 µg/sample after preparation.

- Aldrin
- alpha-BHC
- beta-BHC
- delta-BHC
- gamma-BHC (Lindane)
- alpha-Chlordane
- gamma-Chlordane
- 4,4'-DDD
- 4,4'-DDE
- 4,4'-DDT
- Dieldrin
- Endosulfan I
- Endosulfan II
- Endosulfan sulfate
- Endrin
- Endrin aldehyde
- Endrin ketone
- Heptachlor
- Heptachlor epoxide (beta)
- Methoxychlor

PCBs on Polyurethane Foam

CRM	PT	QR
Cat. #1112	Cat. #1012 Q	Cat. #1112QR

One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Methods TO-04A, TO-10A, or other applicable methods. Contains one aroclor, randomly selected from the list below, at 2–10 µg/sample after preparation.

- Aroclor 1016
- Aroclor 1221
- Aroclor 1232
- Aroclor 1242
- Aroclor 1248
- Aroclor 1254
- Aroclor 1260

PAHs on Polyurethane Foam

CRM	PT	QR
Cat. #1113	Cat. #1013 Q	Cat. #1113QR

One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Method TO-13A, or other applicable methods. Contains at least 13 analytes, randomly selected from the list below, at 10–200 µg/sample after preparation.

- Acenaphthene
- Acenaphthylene
- Anthracene
- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(a)pyrene
- Chrysene
- Dibenz(a,h)anthracene
- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Naphthalene
- Phenanthrene
- Pyrene

Aldehydes & Ketones on Sorbent

CRM	PT	QR
Cat. #1114	Cat. #1014 Q	Cat. #1114QR

One 2 mL flame-sealed ampule to be spiked onto sorbent. Use with EPA Method TO-11A, or other applicable methods. Contains at least four analytes, randomly selected from the list below, at 0.5–10 µg/sample after preparation.

- Acetaldehyde
- Acetone
- Benzaldehyde
- 2-Butanone (MEK)
- Butyraldehyde (Butanal)
- Crotonaldehyde
- 2,5-Dimethylbenzaldehyde
- Formaldehyde
- Hexaldehyde (Hexanal)
- Isovaleraldehyde
- Propionaldehyde (Propanal)
- o-Tolualdehyde
- m-Tolualdehyde
- p-Tolualdehyde
- Valeraldehyde (Pentanal)

CRM – Certified Reference Material
PT – Proficiency Testing
QR – QuiK Response
RM – Reference Material

Q All Waters ERA Air & Emissions PTs open quarterly. Quarterly months are January, April, July, and October.

Metals

Metals on Filter Paper

CRM	PT		QR
Cat. #1125	Cat. #1025	Q	Cat. #1125QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter ready for use with EPA Method 29 or other applicable methods.

Antimony	25–250 µg/filter
Arsenic	20–250 µg/filter
Barium	20–250 µg/filter
Beryllium	10–250 µg/filter
Cadmium	10–250 µg/filter
Chromium	15–250 µg/filter
Cobalt	10–250 µg/filter
Copper	10–250 µg/filter
Lead	20–350 µg/filter
Manganese	10–250 µg/filter
Nickel	20–250 µg/filter
Phosphorus	10–250 µg/filter
Selenium	20–250 µg/filter
Silver	30–250 µg/filter
Thallium	30–250 µg/filter
Zinc	20–250 µg/filter

Metals in Impinger Solution

CRM	PT		QR
Cat. #1126	Cat. #1026	Q	Cat. #1126QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 29, or other applicable methods.

Antimony	0.25–20 µg/mL
Arsenic	0.2–20 µg/mL
Barium	0.15–25 µg/mL
Beryllium	0.05–20 µg/mL
Cadmium	0.1–20 µg/mL
Chromium	0.2–20 µg/mL
Cobalt	0.1–25 µg/mL
Copper	0.2–20 µg/mL
Lead	0.2–20 µg/mL
Manganese	0.1–20 µg/mL
Nickel	0.15–30 µg/mL
Phosphorus	0.15–25 µg/mL
Selenium	0.15–25 µg/mL
Silver	0.5–20 µg/mL
Thallium	0.15–25 µg/mL
Zinc	0.15–25 µg/mL

Mercury on Filter Paper

CRM	PT		QR
Cat. #1127	Cat. #1027	Q	Cat. #1127QR

One 2 mL flame-sealed ampule containing approximately 2 mL of standard concentrate and a 50 mm polystyrene petri dish containing a single 47 mm glass fiber filter. Sample is ready for use with EPA Method 29, or other applicable methods.

Mercury	1–75 µg/filter

Mercury in Impinger Solution

CRM	PT		QR
Cat. #1128	Cat. #1028	Q	Cat. #1128QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Methods 29, 101a, or other applicable methods.

Mercury	0.9–200 ng/mL

Lead on Filter Paper

CRM	PT		QR
Cat. #1129	Cat. #1029	Q	Cat. #1129QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter spiked with lead ready-for-use with EPA Method 12 or other applicable methods.

Lead	20–350 µg/filter

Lead in Impinger Solution

CRM	PT		QR
Cat. #1130	Cat. #1030	Q	Cat. #1130QR

One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 12, or other applicable methods.

Lead	0.2–120 µg/mL

Chromium on Filter Paper

CRM	PT		QR
Cat. #1131	Cat. #1031	Q	Cat. #1131QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm fiber film filter for use with CARB Method 425, or other applicable methods.

Total chromium	1–20 µg/filter
Hexavalent chromium	1–20 µg/filter

Hexavalent Chromium in Impinger Solution

CRM	PT		QR
Cat. #1132	Cat. #1032	Q	Cat. #1132QR

One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 0061/7199, or other applicable methods.

Hexavalent chromium	45–880 µg/L

Inorganics

Hydrogen Halides & Halogens in Impinger Solution

CRM	PT	QR
Cat. #1140	Cat. #1040 Q	Cat. #1140QR

Two impinger solution samples packaged in 15 mL screw-top vials containing approximately 14 mL of standard concentrate for use with EPA Methods 26, 26a, or other applicable methods.

Total halides	10–1000 mg/L
Total halogens	10–200 mg/L
Hydrogen chloride	5–500 mg/L
Hydrogen fluoride	5–500 mg/L
Hydrogen bromide	5–100 mg/L
Bromine	5–100 mg/L
Chlorine	5–100 mg/L

Fluoride in Impinger Solution

CRM	PT	QR
Cat. #1141	Cat. #1041 Q	Cat. #1141QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Methods 13a, 13b, 14, or other applicable methods.

Fluoride	1–50 mg/dscm

Nitrogen Oxide in Impinger Solution

CRM	PT	QR
Cat. #1142	Cat. #1042 Q	Cat. #1142QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 7, or other applicable methods.

Oxides of nitrogen (NOx)	100–2000 mg/dscm

Sulfur Dioxide in Impinger Solution

CRM	PT	QR
Cat. #1143	Cat. #1043 Q	Cat. #1143QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 6 and Method 8, or other applicable methods.

Sulfur dioxide	50–2000 mg/dscm

Sulfuric Acid & Sulfur Dioxide in Impinger Solution

CRM	PT	QR
Cat. #1144	Cat. #1044 Q	Cat. #1144QR

One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 8, or other applicable methods.

Sulfuric acid	5–150 mg/dscm

Ammonia in Impinger Solution

CRM	PT	QR
Cat. #1145	Cat. #1045 Q	Cat. #1145QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA CTM 027, or other applicable methods.

Ammonium	0.1–10 mg/L

Particulate Matter on Filter Paper

CRM	PT	QR
Cat. #1150	Cat. #1050 Q	Cat. #1150QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter ready for use with EPA Methods 5, 5A, 5B, 5D, 5F, or other applicable methods.

Particulate matter	50–600 mg/filter

Particulate Matter in Impinger Solution

CRM	PT	QR
Cat. #1151	Cat. #1051 Q	Cat. #1151QR

One impinger solution sample packaged in a 250 mL polyethylene bottle containing approximately 250 mL of standard ready for use with EPA Methods 5, 5A, 5B, 5D, 5F, or other applicable methods.

Particulate matter	140–675 mg/L

CRM – Certified Reference Material
PT – Proficiency Testing
QR – QuiK Response

Q All Waters ERA Air & Emissions PTs open quarterly. Quarterly months are January, April, July, and October.

Learn more about Air & Emissions products