



# CALIBRATION STANDARDS

A variety of inorganic standards including metals, anions, pH, and other common inorganics that can be used for primary calibration or to prepare second source calibration standards.



# 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](http://www.eraqc.com/AboutERA/Accreditations).

**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	Page
AA/ICP Metals	78
Anions	77
Cations by Ion Chromatography - 100 mg/L	76
Cations by Ion Chromatography - 1000 mg/L	76
Chemical Oxygen Demand (COD) - 1000 mg/L	76
Flame AA Cations	78
Flame AA Trace Metals	78
ICP Trace Metals	78
ICP-MS Major Cations	77
ICP-MS Metals	77
ICP-MS Trace Metals	77
Inorganics - 1000 mg/L	76
Ion Chromatography	77
Ions - 1000 mg/L	76
MBAS/LAS Surfactants - 1000 mg/L	76
Metals - 1000 mg/L	77
pH Buffers	78
Phenol - 1000 mg/L	76
Sulfide - 1000 mg/L	76
Total Kjeldahl Nitrogen (TKN) - 1000 mg/L	76
Total Organic Carbon (TOC) - 1000 mg/L	76
Total Organic Halides (TOX) - 1000 mg/L	76

# 1000 mg/L Standards

Standards can be used for primary calibration or to prepare second source calibration check standards. They are analytically traceable to NIST SRM's where available, and are guaranteed stable for one year. The certification documentation includes manufacturing uncertainties, traceability summaries and densities to aid in performing gravimetric dilutions. The documentation for metal standards includes impurities.

## Inorganics – 1000 mg/L

### Chemical Oxygen Demand (COD)

500 mL Bottle  
Cat. #974

125 mL Bottle  
Cat. #042

One 1000 mg/L standard preserved with H<sub>2</sub>SO<sub>4</sub> in an amber glass bottle.

### Total Kjeldahl Nitrogen (TKN)

500 mL Bottle  
Cat. #996

125 mL Bottle  
Cat. #043

One 1000 mg/L standard preserved with HCl in a poly bottle.

### MBAS/LAS Surfactants

Cat. #975

One 15 mL screw-cap vial with LAS at 1000 mg/L preserved with H<sub>2</sub>SO<sub>4</sub>.

### Total Organic Carbon (TOC)

Cat. #978

One 500 mL amber glass bottles with TOC at 1000 mg/L preserved with H<sub>2</sub>SO<sub>4</sub>.

### Total Organic Halides (TOX)

Cat. #976

One 2 mL flame-sealed ampule with TOX at 1000 mg/L in methanol.

### Phenol

Cat. #982

One 500 mL amber glass bottle with phenol at 1000 mg/L preserved with H<sub>2</sub>SO<sub>4</sub>.

### Sulfide

Cat. #999

One 10 mL flame-sealed ampule containing 1000 mg/L sulfide preserved with NaOH and zinc acetate.

## Ions – 1000 mg/L

Parameter	Matrix	500 mL Bottle	125 mL Bottle
Acetate	H <sub>2</sub> O	—	Cat. #78202
Ammonia as NH <sub>3</sub>	H <sub>2</sub> O	Cat. #986	Cat. #044
Ammonia as N	H <sub>2</sub> O	Cat. #985	Cat. #045
Bromate	H <sub>2</sub> O	—	Cat. #065
Bromide	H <sub>2</sub> O	Cat. #987	Cat. #046
Chlorate	H <sub>2</sub> O	—	Cat. #066
Chloride	H <sub>2</sub> O	Cat. #988	Cat. #047
Chlorite	H <sub>2</sub> O	—	Cat. #067
Complex cyanide*	NaOH	Cat. #998	Cat. #049
Cyanide (free)*	NaOH	Cat. #997	Cat. #048
Fluoride	H <sub>2</sub> O	Cat. #989	Cat. #050
Iodide	H <sub>2</sub> O	—	Cat. #78212
Nitrate as NO <sub>3</sub>	H <sub>2</sub> O	Cat. #992	Cat. #051
Nitrate as N	H <sub>2</sub> O	Cat. #991	Cat. #052
Nitrite as N	H <sub>2</sub> O	Cat. #990	Cat. #053
Perchlorate	H <sub>2</sub> O	—	Cat. #068
Phosphate as PO <sub>4</sub>	H <sub>2</sub> O	Cat. #994	Cat. #060
Phosphate as P	H <sub>2</sub> O	Cat. #993	Cat. #061
Sulfate	H <sub>2</sub> O	Cat. #995	Cat. #062

\*Dangerous good. Requires special shipping.

## Cations by Ion Chromatography – 100 mg/L

Parameter	Matrix	125 mL Bottle
Ammonium as NH <sub>4</sub>	H <sub>2</sub> O	Cat. #78102
Ammonium as N	H <sub>2</sub> O	Cat. #78104

## Cations by Ion Chromatography – 1000 mg/L

Parameter	Matrix	125 mL Bottle
Calcium	H <sub>2</sub> O	Cat. #K10
Magnesium	H <sub>2</sub> O	Cat. #K11

# Metals – 1000 mg/L

Parameter	Matrix		125 mL Bottle
Aluminum	HNO <sub>3</sub>	DG	Cat. #011
Arsenic	HNO <sub>3</sub>	DG	Cat. #013
Beryllium	HNO <sub>3</sub>	DG	Cat. #015
Bismuth	HNO <sub>3</sub>	DG	Cat. #K01
Calcium	HNO <sub>3</sub>	DG	Cat. #018
Chromium	HNO <sub>3</sub>	DG	Cat. #020
Chromium VI	H <sub>2</sub> O	—	Cat. #019
Cobalt	HNO <sub>3</sub>	DG	Cat. #021
Copper	HNO <sub>3</sub>	DG	Cat. #022
Iron	HNO <sub>3</sub>	DG	Cat. #023
Lead	HNO <sub>3</sub>	DG	Cat. #024
Lithium	HNO <sub>3</sub>	DG	Cat. #K04
Magnesium	HNO <sub>3</sub>	DG	Cat. #025
Manganese	HNO <sub>3</sub>	DG	Cat. #026
Mercury	HNO <sub>3</sub>	DG	Cat. #027
Molybdenum	HNO <sub>3</sub>	DG	Cat. #028
Nickel	HNO <sub>3</sub>	DG	Cat. #029
Phosphorus	HNO <sub>3</sub>	DG	Cat. #063
Potassium	HNO <sub>3</sub>	DG	Cat. #030
Selenium	HNO <sub>3</sub>	DG	Cat. #031
Silica	H <sub>2</sub> O	—	Cat. #064
Silicon	HNO <sub>3</sub>	DG	Cat. #032
Silver	HNO <sub>3</sub>	DG	Cat. #033
Sodium	HNO <sub>3</sub>	DG	Cat. #034
Strontium	HNO <sub>3</sub>	DG	Cat. #035
Thallium	HNO <sub>3</sub>	DG	Cat. #036
Tin	HCl	DG	Cat. #037
Titanium	HCl	DG	Cat. #038
Vanadium	HNO <sub>3</sub>	DG	Cat. #039
Yttrium	HNO <sub>3</sub>	DG	Cat. #K08
Zinc	HNO <sub>3</sub>	DG	Cat. #040

DG – Dangerous good. Requires special shipping.

Other metals, concentrations, and volumes are also available.

Call Waters ERA Customer Service for more information.

# ICP-MS Metals

These standards come with a Certificate of Traceability and Uncertainty. Use for initial as well as continuing calibration and tuning verification. Provided as convenient concentrates with densities allowing you to easily perform gravimetric dilutions.

## ICP-MS Trace Metals

CRM  
Cat. #TMS001\*

One 125 mL screw-cap poly bottle preserved with HNO<sub>3</sub> and tartaric acid\*

Aluminum.....	10.0 mg/L	Manganese.....	10.0 mg/L
Antimony.....	10.0 mg/L	Molybdenum.....	10.0 mg/L
Arsenic.....	10.0 mg/L	Nickel.....	10.0 mg/L
Barium.....	10.0 mg/L	Selenium.....	10.0 mg/L
Beryllium.....	10.0 mg/L	Silver.....	10.0 mg/L
Cadmium.....	10.0 mg/L	Thallium.....	10.0 mg/L
Chromium.....	10.0 mg/L	Thorium.....	10.0 mg/L
Cobalt.....	10.0 mg/L	Uranium.....	10.0 mg/L
Copper.....	10.0 mg/L	Vanadium.....	10.0 mg/L
Iron.....	10.0 mg/L	Zinc.....	10.0 mg/L
Lead.....	10.0 mg/L		

\*Dangerous good. Requires special shipping.

## ICP-MS Major Cations

CRM  
Cat. #TMS002\*

One 125 mL screw-cap poly bottle preserved with HNO<sub>3</sub>\*

Calcium.....	50.0 mg/L	Potassium.....	50.0 mg/L
Magnesium.....	50.0 mg/L	Sodium.....	50.0 mg/L

\*Dangerous good. Requires special shipping.

# Anions

## Ion Chromatography

CRM  
Cat. #981

One 15 mL screw-cap vial yields up to 200 mL after dilution. Designed to calibrate or verify IC calibrations.

Call for anion standards at lower levels.

Bromide.....	0.2-20 mg/L	Nitrate as N.....	0.2-20 mg/L
Chloride.....	0.2-20 mg/L	Phosphate as P.....	0.5-30 mg/L
Fluoride.....	0.1-10 mg/L	Sulfate.....	0.5-30 mg/L



Learn more about Calibration products

# AA/ICP Metals

All metals standards come with a Certificate of Traceability. The ICP Trace Metals standard also includes uncertainties. Use as initial as well as continuing calibration verification.

## Flame AA Trace Metals

CRM  
Cat. #508

One 24 mL screw-cap vial, preserved with HNO<sub>3</sub>, yields up to 500 mL after dilution. Designed for flame AA. Includes aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, strontium, thallium, vanadium, and zinc.

## Flame AA Cations

CRM  
Cat. #530

One 15 mL screw-cap vial, preserved with HNO<sub>3</sub>, yields up to 250 mL after dilution.

Use with ICP, IC, and AA methods.

Calcium.....	10-200 mg/L
Magnesium.....	10-200 mg/L
Potassium.....	5-100 mg/L
Sodium.....	10-250 mg/L

## ICP Trace Metals

CRM  
Cat. #524\*

One 500 mL whole-volume standard, preserved with HNO<sub>3</sub> and HCl, is ready-to-use\*

Aluminum.....	10.0 mg/L
Antimony.....	1.0 mg/L
Arsenic.....	1.0 mg/L
Barium.....	1.0 mg/L
Beryllium.....	1.0 mg/L
Bismuth.....	1.0 mg/L
Boron.....	1.0 mg/L
Cadmium.....	1.0 mg/L
Calcium.....	10.0 mg/L
Chromium.....	1.0 mg/L
Cobalt.....	1.0 mg/L
Copper.....	1.0 mg/L
Iron.....	10.0 mg/L
Lanthanum.....	10.0 mg/L
Lead.....	10.0 mg/L
Magnesium.....	10.0 mg/L
Manganese.....	1.0 mg/L
Molybdenum.....	1.0 mg/L
Nickel.....	1.0 mg/L
Phosphorus.....	1.0 mg/L
Potassium.....	10.0 mg/L
Selenium.....	10.0 mg/L
Sodium.....	10.0 mg/L
Strontium.....	1.0 mg/L
Tin.....	1.0 mg/L
Titanium.....	1.0 mg/L
Vanadium.....	1.0 mg/L
Zinc.....	1.0 mg/L

\*Dangerous good. Requires special shipping.

# pH Buffers

Our pH Buffers are analytically traceable to NIST SRMs, mercury free, guaranteed stable for at least one year after your receipt, and are supplied with a full certificate of analysis. Choose single bottles or convenient six-bottle cases.

Value	Volume	Single Bottle	Six-Bottle Case
pH 4.00	1 pint	Cat. #127	Cat. #128
pH 7.00	1 pint	Cat. #131	Cat. #132
pH 10.00	1 pint	Cat. #135	Cat. #136
Case of 2 ea.	Pints		Cat. #141

# CHROMATOGRAPHIC AND SAMPLE CLEANUP PRODUCTS FROM WATERS

## Sample Preparation

### Sample concentration and cleanup

#### Oasis Sample Extraction Products

Analysis of water samples often requires concentration and cleanup of "dirty" or complex matrices. Oasis™ Solid-Phase Extraction (SPE) Products allow for simple and rapid method development. With the Oasis product line, you can expect robust SPE methods that provide reproducible results and high recoveries, without having to be concerned with sorbent drying or pH limitations.

#### Key features/benefits

- Greater capacity.
- Excellent stability over entire pH range.
- Cleanest extracts.
- Elimination of matrix effects.
- Reduction of ion suppression.
- Superior recovery, reproducibility, retention, and selectivity for a wide variety of compounds.
- Available in cartridges or high throughput, 96-well plates.



Oasis Sample Extraction Products.

### Reduce interference and increase sensitivity for better quality results

#### Certified Sep-Pak SPE Cartridges

Sep-Pak™ SPE Cartridges are widely used by scientists for trace-level analysis in water samples. Manufactured using strict performance and cleanliness specifications and QC-tested for extractables and leachables, Certified Sep-Pak Sample Preparation Products reduce interference and increase sensitivity by eliminating contaminants introduced by the cartridge hardware and sorbents.

#### Key features/benefits

- Superior extracts for water sample residue analysis.
- Cleanliness and reproducibility needed for demanding sample preparation methods.
- Allows for accurate, high-quality water testing results.



Sep-Pak SPE Cartridges.

### Certified cleanliness for ultra-trace level analysis

#### Vials

Waters Certified Vials are manufactured to exacting standards, tested and certified to give you confidence that the peaks you observe are representative of your sample, not your vials.

#### Key features/benefits

- Prevent ghost peaks stemming from contaminants.
- Eliminate unexplained masses in MS.
- Eliminate potential of needle damage due to tight dimensional specifications.



Waters Certified Vials.

# LC COLUMNS AND CONSUMABLES

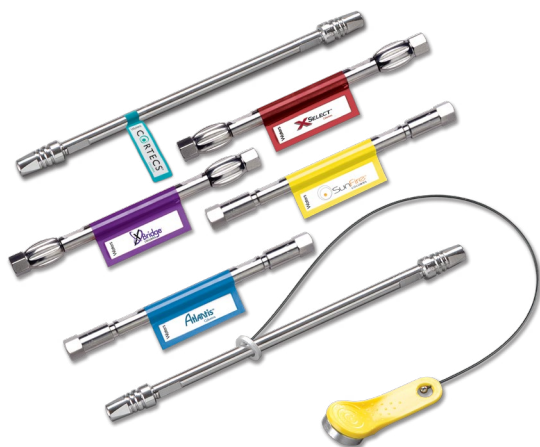
Maximize efficiency, ruggedness, and throughput

## LC Columns

Featured in methods to meet regulatory requirements throughout the world, Waters columns provide cutting-edge performance. In addition to our complete selection of UHPLC, UPLC™, and HPLC column chemistries, Waters also provides application-specific columns for optimal specificity.

### Key features/benefits

- Industry leading reliability and reproducibility.
- Wide range of general purpose and application specific columns.
- Uncompromised analytical performance.



UPLC, UHPLC, and HPLC Columns.

Standardize and simplify workflows

## Analytical Standards and Reagents

Waters understands that the quality of the standards and reagents you use directly correlates to the quality of your results. Our standards are precisely formulated to ensure data comparability and defensibility over time, and provide absolute traceability to meet your quality assurance requirements.

### Key features/benefits

- Saves costly validation time of standards and reagents.
- Easy and convenient formulations and packaging ensure accuracy of LC and LC-MS results over time.
- Optimized kits to keep your system operating at peak performance.



Waters Analytical Standards and Reagents.

# Waters™

These and many more products are available for purchase directly from

[waters.com](http://waters.com), or call 800.252.HPLC (4752)



This Page Left  
Blank Intentionally