



2011

**CATALOG OF ANALYTICAL STANDARDS**

# Welcome to the HPS 2011 Catalog

High-Purity Standards begins 2011 with an exciting development: construction of our new facility just 3 miles from our present location. Our new facility will provide us expanded laboratory facilities to support the continued expansion of our product lines.

**Organic Standards:** Our newest and biggest expansion is offering organic standards in this catalog. We have long manufactured organic standards as custom products. Beginning in 2011, HPS will include the new organic products at cost-effective prices and in lower quantities. These materials will be produced within the scope of a quality system that includes ISO/IEC 17025:2005 and ISO Guide 34:2009 accreditations. Our initial offerings will focus on those standards needed for GC/FID, GC/ECD, and GC/MS. Future offerings will support the laboratory needs for other analytical methods, including HPLC. We invite our customers to visit our online store at [www.highpuritystandards.com](http://www.highpuritystandards.com) for a list of current products.

**Custom Designed Products:**

Over half of our business is devoted to manufacturing custom standards for a broad range of analytical needs, both inorganic and organic. Our staff has extensive experience in manufacturing standards for a range of industries: including mining, pharmaceutical, environmental, and industrial. This experience includes preparation of custom XRF standards, metals in basic media, and bulk custom standards. Our industrial hygiene standards include a variety of filter media, and both spike dissolved or solid inorganic components.

**Packaging Options:** We stock inorganic solutions in 50mL, 100mL, 250mL and 500mL sizes. The 50mL size is designed for those laboratories who need a smaller volume of solution, thereby limiting waste disposal costs. In addition, we offer smaller volumes

that meet excepted quantity limits for hazardous shipping. Our customer service representatives will be happy to assist you with this need. Our organic standards are available in 1mL, 2mL and 10mL ampoules. Both smaller and larger volumes are also available. Please let us know if you have these requirements.

**Quality System:** High-Purity Standards holds certificates for ISO Guide 9001:2008, ISO/IEC 17025:2005, and ISO Guide 34:2009. The scope of our accreditations has been limited to inorganic components in the past. We understand that quality systems are the most effective when they continue to improve and expand. Consequently, we have recently expanded the scope for our ISO/IEC 17025:2005 accreditation to include GC/FID, GC/ECD, and GC/

MS. At the same time we have expanded the scope of our ISO Guide 34:2009 accreditation to include both organic and inorganic single and multi-component standards. We welcome our customers' feedbacks on our products and services. We understand that customer satisfaction is the keystone of our quality program.

**Website:** This catalog is a representation of the HPS product line. Our web site,

[www.highpuritystandards.com](http://www.highpuritystandards.com) provides a complete and up to date listing of our catalog items. Please visit our website to view our complete listing, including "new" or "discounted" products, or simply to contact us or provide feedback.



Handwritten signature of Theodore C. Rains in black ink.

Theodore C. Rains, Ph.D.  
President

Handwritten signature of Connie Rains Hayes in black ink.

Connie Rains Hayes  
CEO

Find this online @ [highpuritystandards.com/about](http://highpuritystandards.com/about)



High-Purity Standards, Inc. was founded in 1990 by Dr. Theodore Rains following his retirement from the National Institute of Standards and Technology (NIST). During his time at NIST, Dr. Rains developed many procedures now used at HPS. Today, High-Purity Standards serves the scientific community with standards and reference material for both organic and inorganic analyses.

# Table of Contents

<b>Ordering Information</b> . . . . .	<b>2</b>	<b>AAS Solutions</b> . . . . .	<b>23</b>
<b>Organic Multi-Compound Standards</b> . . . . .	<b>3</b>	Matrix Modifiers for Graphite Furnace . . . . .	23
<b>Custom Designed Blends</b> . . . . .	<b>4</b>	Ionization Buffers for Flame AAS . . . . .	23
<b>Single-Element Standards</b> . . . . .	<b>5</b>	<b>Metallo-Organic Standards</b> . . . . .	<b>24</b>
Single-Element Dilutions . . . . .	8	Single-Element Standards . . . . .	24
<b>ICP Multielement Standards</b> . . . . .	<b>9</b>	<b>Ion Chromatography Standards</b> . . . . .	<b>25</b>
ICP Working Calibration Solutions . . . . .	9	Single Component IC Standards . . . . .	25
Wavelength Calibration Solution . . . . .	9	Multielement IC Standards . . . . .	26
ICP Analytical Mixtures . . . . .	10	Bio IC Calibration Standards . . . . .	26
Initial Check Verification Standards . . . . .	11	<b>Water Standards</b> . . . . .	<b>27</b>
Continuing Check Verification Standards . . . . .	11	Trace Metals in Drinking Water Standards . . . . .	27
EPA Method 200.7 Calibration Standards . . . . .	12	Simulated Rainwater . . . . .	27
Interference Check Standards . . . . .	13	Primary Drinking Water Metals . . . . .	27
ICP Stock Solution . . . . .	13	Secondary Drinking Water Metals . . . . .	27
ICP-RCRA . . . . .	13	Certified Wastewater - Trace Metals Solutions . . . . .	28
Quality Control Standards . . . . .	14	<b>Natural &amp; Simulated Matrix</b>	
<b>Contract Laboratory Program</b> . . . . .	<b>15</b>	<b>Reference Materials</b> . . . . .	<b>29</b>
CLP Calibration Standards . . . . .	15	Soil and Biological Solutions . . . . .	29
CLP Check Verification Standards . . . . .	15	Solid CRM List . . . . .	29
CLP Interference Check Standards . . . . .	15		
CLP Spike Standards . . . . .	16		
CLP Analyte Standards . . . . .	16		
CRDL Detection Limit Standard . . . . .	16		
<b>ICP Single-Element Kits</b> . . . . .	<b>17</b>		
ICP Starter Kits . . . . .	17		
ICP-MS Starter Kits . . . . .	17		
<b>Filter Media</b> . . . . .	<b>18</b>		
Trace Metals on Filter Media for Industrial			
Hygiene and Ambient Air Analysis . . . . .	18		
<b>ICP-MS Multielement Standards</b> . . . . .	<b>19</b>		
ICP-MS Calibration Standards . . . . .	19		
Interference Check Solutions . . . . .	19		
ICP-MS Verification Standards . . . . .	20		
ICP-MS Method 6020 . . . . .	20		
Tuning Solutions . . . . .	21		
EPA Method 200.8 Calibration Standards . . . . .	21		
68-Element Standard . . . . .	22		
ICP-MS Internal Standards . . . . .	22		



# Ordering Information

Find this online @ [highpuritystandards.com/oi](http://highpuritystandards.com/oi)

## Placing an Order

There are five methods available for ordering:

**By Internet**            [www.highpuritystandards.com](http://www.highpuritystandards.com)  
(secure server)

**By E-Mail**             [info@highpuritystandards.com](mailto:info@highpuritystandards.com)

**By Telephone**        (866) 767-4771 Toll Free  
(8:00 A.M. – 6:00 P.M. E.S.T)

**By Fax** (24 hours)    (866) 767-4771 Toll Free

**By Mail**                P.O. Box 41727  
Charleston, SC 29423

## Pricing and Terms of Sale

Prices are quoted FOB Charleston, SC, USA and are subject to change without notice. High-Purity Standards accepts payment via credit card (VISA, MASTERCARD, AND AMERICAN EXPRESS) or purchase order. Invoices for purchase orders are marked 30 Days Net from date of invoice. If a written purchase order is to follow a telephone order, please clearly indicate on the hard copy **“Confirmation only. Do not duplicate order.”**



## Return Policy

We will accept any unopened catalog item returned for any reason within 30 days of purchase, and you will receive full credit. A restocking fee of 20% per item will be assessed for any item returned after 30 days. Any catalog item or custom mix can be returned for replacement if the item is found to be erroneous. ALL returns must be authorized. Please call (866) 767-4771 to receive a return authorization number (RA#).

## Certificate of Analysis and Safety Sheets

Each product will include a Certificate of Analysis and a Material Safety Data Sheet. NIST traceability documentation is included in the Certificate of Analysis.

## Shipping

Orders for catalog items are generally shipped the same day if the order is received before 2pm (ET). Shipment dates for custom blends are confirmed with the receipt of an order. Our standard method of shipment is ground service. Expedited delivery services are available. Shipping charges are prepaid and added to the invoice. Any additional charges incurred by hazardous shipping regulations and COD requests will be paid by the customer.

## Laboratory Use

HPS products are intended for laboratory use only. They are not intended for medical, food, drug, or household use. All products should be handled and used by trained professional personnel only. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user.





# Custom Designed Blends

Find this online @ [highpuritystandards.com/cdb](http://highpuritystandards.com/cdb)

Over half of the standards manufactured at High-Purity Standards are custom blends. HPS welcomes requests for special blends to meet our customer's needs. If there isn't a product offering that will meet your needs, send us the following information via our online quote form, FAX, e-mail, or telephone, and we will provide a competitive quotation:

- Analyte(s) (organic compounds, inorganic metals or components, cations or anions, etc.)
- Concentration, including units, of each analyte (if units are in percent, please specify preparation by weight or by volume)
- Matrix (if industrial hygiene standards, identify material, pore size, and diameter of filter)
- Volume and quantity
- Other requirements
- Intended Use (please indicate the instrumentation and/or method of analysis)
- Point of contact for confirmation or to discuss technical questions

Our staff will review your request. If we need to make any changes, either for compatibility or to address expiration periods, we will contact you first to discuss the modification of the custom blend to fit your needs. We will provide a quotation along with a description of your custom standard for your review. Most special mixtures are prepared within three to five days of receipt of the purchase order. The shipping date of your custom blend will be confirmed upon order. The staff at High-Purity Standards takes great pride in our ability to provide standards for our customers. We are available for technical support to help you design the right standard for your laboratory needs.

## Analytical Reagents

### Acid Reagent Blanks

Catalog No.	Description	Volume
<b>RB-HNO3-2</b>	2% Nitric Acid Reagent Blank	500 mL
<b>RB-HNO3-5</b>	5% Nitric Acid Reagent Blank	500 mL
<b>RB-HCl-2</b>	2% Hydrochloric Acid Reagent Blank	500 mL
<b>RB-HCl-5</b>	5% Hydrochloric Acid Reagent Blank	500 mL
<b>RB-H2O</b>	High-Purity D.I. 18 megaohm Water	500 mL

### High-Purity Subboiling Distilled Acids

All acids are bottled in Teflon bottles.

Catalog No.	Description	Volume
<b>SB-HNO3-500</b>	Nitric Acid	500 mL
<b>SB-HNO3-1L</b>	Nitric Acid	1000 mL
<b>SB-HCl-500</b>	Hydrochloric Acid	500 mL
<b>SB-HCl-1L</b>	Hydrochloric Acid	1000 mL

# Single-Element Standards

Find this online @ [highpuritystandards.com/ses](http://highpuritystandards.com/ses)

For the following standards, concentrations include both 1000 and 10.00 (10,000 µg/mL) in aqueous solution unless noted otherwise. The selection of single elements listed below are maintained in stock. Refer to page 8 for information on dilutions of these products. Most standards are packaged in 50, 100, 250, and 500 mL HDPE or LDPE laboratory grade bottles. The density is provided on the Certificate of Analysis as additional information for the user.

The accuracy of all standards is verified against NIST Spectrometric Standard Solutions. A Certificate of Analysis and Safety Data Sheet are included with each standard. Standards are certified accurate for a period of 18 months from the date of shipment unless stated otherwise on the Certificate of Analysis.

Element	Source	Concentration	Matrix	Catalog No.	Concentration	Matrix	Catalog No.
Aluminum	Al metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>10001-1</b>	10 mg/mL	10% HNO <sub>3</sub>	<b>10M1-1</b>
Aluminum	Al metal	1000 µg/mL	2% HCl	<b>10001-2</b>	10 mg/mL	10% HCl	<b>10M1-2</b>
Antimony	Sb metal	1000 µg/mL	20% HCl	<b>10002-2</b>	10 mg/mL	50% HCl	<b>10M2-2</b>
Antimony	Sb metal	1000 µg/mL	5% HNO <sub>3</sub> + 0.1% HF	<b>10002-3</b>	10 mg/mL	10% HNO <sub>3</sub> + 2% HF	<b>10M2-3</b>
Antimony	Sb metal as Sb <sup>+3</sup>	1000 µg/mL	20% HCl	<b>10002-6</b>			
Antimony	Sb metal	1000 µg/mL	5% Tartaric Acid + 2% HNO <sub>3</sub>	<b>10002-8</b>			
Arsenic	As metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>10003-1</b>	10 mg/mL	20% HNO <sub>3</sub>	<b>10M3-1</b>
Arsenic	As metal	1000 µg/mL	2% HCl	<b>10003-2</b>	10 mg/mL	10% HCl	<b>10M3-2</b>
Arsenic	As <sub>2</sub> O <sub>3</sub> as As <sup>+3</sup>	1000 µg/mL	2% HCl	<b>10003-6</b>			
Arsenic	Na <sub>2</sub> HAsO <sub>4</sub>	1000 µg/mL	H <sub>2</sub> O	<b>10003-7</b>			
Barium	BaCO <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>10004-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M4-1</b>
Barium	BaCO <sub>3</sub>	1000 µg/mL	2% HCl	<b>10004-2</b>	10 mg/mL	5% HCl	<b>10M4-2</b>
Beryllium	Be acetate	1000 µg/mL	2% HNO <sub>3</sub>	<b>10005-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M5-1</b>
Beryllium	Be acetate	1000 µg/mL	2% HCl	<b>10005-2</b>	10 mg/mL	10% HCl	<b>10M5-2</b>
Bismuth	Bi metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>10006-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M6-1</b>
Bismuth	Bi metal	1000 µg/mL	2% HCl	<b>10006-2</b>			
Boron	H <sub>3</sub> BO <sub>3</sub>	1000 µg/mL	H <sub>2</sub> O	<b>10007-4</b>	5 mg/mL	H <sub>2</sub> O	<b>5M7-4</b>
Boron					10 mg/mL	2% NH <sub>4</sub> OH	<b>10M7-7</b>
Cadmium	Cd metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>10008-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M8-1</b>
Cadmium	Cd metal	1000 µg/mL	2% HCl	<b>10008-2</b>	10 mg/mL	10% HCl	<b>10M8-2</b>
Calcium	CaCO <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>10009-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M9-1</b>
Calcium	CaCO <sub>3</sub>	1000 µg/mL	2% HCl	<b>10009-2</b>	10 mg/mL	5% HCl	<b>10M9-2</b>
Carbon	Na <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	1000 µg/mL	H <sub>2</sub> O	<b>100071-4</b>			
Carbon as TOC	KHC <sub>8</sub> H <sub>4</sub> O <sub>4</sub>	1000 µg/mL	H <sub>2</sub> O	<b>100071-9</b>			
Cerium	CeO <sub>2</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100010-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M10-1</b>
Cerium	CeO <sub>2</sub>	1000 µg/mL	2% HCl	<b>100010-2</b>	10 mg/mL	10% HCl	<b>10M10-2</b>
Cesium	Cs <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100011-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M11-1</b>
Cesium	Cs <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HCl	<b>100011-2</b>	10 mg/mL	1% HCl	<b>10M11-2</b>
Chromium	Cr metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100012-1</b>	10 mg/mL	10% HNO <sub>3</sub>	<b>10M12-1</b>
Chromium	Cr metal	1000 µg/mL	2% HCl	<b>100012-2</b>	10 mg/mL	10% HCl	<b>10M12-2</b>
Chromium	Cr metal as Cr <sup>+3</sup>	1000 µg/mL	2% HCl	<b>100012-6</b>			
Chromium	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> as Cr <sup>+6</sup>	1000 µg/mL	H <sub>2</sub> O	<b>100012-7</b>	10 mg/mL	H <sub>2</sub> O	<b>10M12-7</b>
Cobalt	Co metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100013-1</b>	10. mg/mL	4% HNO <sub>3</sub>	<b>10M13-1</b>

These standards are sold in our standard 100, 250, and 500 mL sizes.

# Single-Element Standards

Find this online @ [highpuritystandards.com/ses](http://highpuritystandards.com/ses)

Element	Source	Concentration	Matrix	Catalog No.	Concentration	Matrix	Catalog No.
Cobalt	Co metal	1000 µg/mL	2% HCl	<b>100013-2</b>	10 mg/mL	10% HCl	<b>10M13-2</b>
Copper	Cu metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100014-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M14-1</b>
Copper	Cu metal	1000 µg/mL	2% HCl	<b>100014-2</b>	10 mg/mL	10% HCl	<b>10M14-2</b>
Dysprosium	Dy <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100015-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M15-1</b>
Dysprosium	Dy <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100015-2</b>	10 mg/mL	4% HCl	<b>10M15-2</b>
Erbium	Er <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100016-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M16-1</b>
Europium	Eu <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100017-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M17-1</b>
Gadolinium	Gd <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100018-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M18-1</b>
Gadolinium	Gd <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100018-2</b>	10 mg/mL	4% HCl	<b>10M18-2</b>
Gallium	Ga metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100019-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M19-1</b>
Gallium	Ga metal	1000 µg/mL	2% HCl	<b>100019-2</b>	10 mg/mL	10% HCl	<b>10M19-2</b>
Germanium	(NH <sub>4</sub> ) <sub>2</sub> GeF <sub>6</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100020-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M20-1</b>
Germanium	Ge metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100020-3</b>	10 mg/mL	10% HNO <sub>3</sub>	<b>10M20-3</b>
Gold	Au metal	1000 µg/mL	2% HCl	<b>100021-2</b>	10 mg/mL	10% HCl	<b>10M21-2</b>
Hafnium	Hf metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.5% HF	<b>100022-3</b>	10 mg/mL	4% HNO <sub>3</sub> + 2% HF	<b>10M22-3</b>
Holmium	Ho <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100023-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M23-1</b>
Holmium	Ho <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100023-2</b>	10 mg/mL	4% HCl	<b>10M23-2</b>
Indium	In metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100024-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M24-1</b>
Indium	In metal	1000 µg/mL	2% HCl	<b>100024-2</b>	10 mg/mL	10% HCl	<b>10M24-2</b>
Iridium	Ir Salt	1000 µg/mL	2% HCl	<b>100025-2</b>			
Iron	Fe metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100026-1</b>	10 mg/mL	10% HNO <sub>3</sub>	<b>10M26-1</b>
Iron	Fe metal	1000 µg/mL	2% HCl	<b>100026-2</b>	10 mg/mL	10% HCl	<b>10M26-2</b>
Iron*	Fe metal as Fe <sup>+2</sup>	1000 µg/mL	2% HCl + 1% Hydroxylamine Hydrochloride	<b>100026-6</b>			
Iron	Fe metal as Fe <sup>+3</sup>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100026-7</b>			
Lanthanum	La <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100027-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M27-1</b>
Lanthanum	La <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100027-2</b>	10 mg/mL	2% HCl	<b>10M27-2</b>
Lead	Pb metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100028-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M28-1</b>
Lead	Pb metal	1000 µg/mL	2% HCl	<b>100028-2</b>			
Lithium	Li <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100029-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M29-1</b>
Lithium	Li <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HCl	<b>100029-2</b>	10 mg/mL	1% HCl	<b>10M29-2</b>
<sup>6</sup> Lithium	<sup>6</sup> Li <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100029-6I</b>			
Lutetium	Lu <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100030-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M30-1</b>
Lutetium	Lu <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100030-2</b>	10 mg/mL	4% HCl	<b>10M30-2</b>
Magnesium	Mg metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100031-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M31-1</b>
Magnesium	Mg metal	1000 µg/mL	2% HCl	<b>100031-2</b>	10 mg/mL	10% HCl	<b>10M31-2</b>
Manganese	Mn Acetate	1000 µg/mL	2% HNO <sub>3</sub>	<b>100032-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M32-1</b>
Manganese	Mn Acetate	1000 µg/mL	2% HCl	<b>100032-2</b>	10 mg/mL	10% HCl	<b>10M32-2</b>
Mercury	Hg metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100033-1</b>	10 mg/mL	10% HNO <sub>3</sub>	<b>10M33-1</b>
Mercury	Diphenylmercury	1000 µg/mL	2% HNO <sub>3</sub>	<b>100033-1D</b>			
Mercury	HgCl <sub>2</sub>	1000 µg/mL	2% HCl	<b>100033-2</b>			
Mercury	HgCl <sub>2</sub>	1000 µg/mL	3% HNO <sub>3</sub> <sup>+</sup> 4% HCl	<b>100077-12</b>			

NOTE: \*100026-6 Fe<sup>+2</sup> Exp Date: 3 Months

These standards are sold in our standard 100, 250, and 500 mL sizes.

# Single-Element Standards

Find this online @ [highpuritystandards.com/ses](http://highpuritystandards.com/ses)

Element	Source	Concentration	Matrix	Catalog No.	Concentration	Matrix	Catalog No.
Molybdenum	Mo metal	1000 µg/mL	2% HCl	<b>100034-2</b>	10 mg/mL	10% HCl	<b>10M34-2</b>
Molybdenum	Mo metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.1% HF	<b>100034-3</b>	10 mg/mL	4% HNO <sub>3</sub> + 2% HF	<b>10M34-3</b>
Molybdenum	(NH <sub>4</sub> ) <sub>2</sub> MoO <sub>4</sub>	1000 µg/mL	H <sub>2</sub> O	<b>100034-4</b>	10 mg/mL	H <sub>2</sub> O	<b>10M34-4</b>
Neodymium	Nd <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100035-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M35-1</b>
Neodymium	Nd <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100035-2</b>	10 mg/mL	4% HCl	<b>10M35-2</b>
Nickel	Ni metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100036-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M36-1</b>
Nickel	Ni metal	1000 µg/mL	2% HCl	<b>100036-2</b>	10 mg/mL	10% HCl	<b>10M36-2</b>
Niobium	Nb metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.5% HF	<b>100037-3</b>	10 mg/mL	4% HNO <sub>3</sub> + 1% HF	<b>10M37-3</b>
Osmium	(NH <sub>4</sub> ) <sub>2</sub> OsCl <sub>6</sub>	1000 µg/mL	10% HCl	<b>100070-2</b>			
Palladium	Pd metal	1000 µg/mL	10% HNO <sub>3</sub> + Tr HCl	<b>100038-1</b>	10 mg/mL	10% HNO <sub>3</sub> + Tr HCl	<b>10M38-1</b>
Palladium	Pd metal	1000 µg/mL	5% HCl	<b>100038-2</b>	10 mg/mL	10% HCl	<b>10M38-2</b>
Phosphorus	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	1000 µg/mL	0.05% HNO <sub>3</sub>	<b>100039-1</b>	10 mg/mL	0.05% HNO <sub>3</sub>	<b>10M39-1</b>
Phosphorus	KH <sub>2</sub> PO <sub>4</sub>	1000 µg/mL	0.05% HNO <sub>3</sub>	<b>100039-1K</b>	10 mg/mL	0.05% HNO <sub>3</sub>	<b>10M39-1K</b>
Platinum	Pt metal	1000 µg/mL	5% HCl	<b>100040-2</b>	10 mg/mL	10% HCl	<b>10M40-2</b>
Potassium	KNO <sub>3</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100041-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M41-1</b>
Potassium	KCl	1000 µg/mL	1% HCl	<b>100041-2</b>	10 mg/mL	1% HCl	<b>10M41-2</b>
Praseodymium	Pr <sub>6</sub> O <sub>11</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100042-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M42-1</b>
Praseodymium	Pr <sub>6</sub> O <sub>11</sub>	1000 µg/mL	2% HCl	<b>100042-2</b>	10 mg/mL	4% HCl	<b>10M42-2</b>
Rhenium	Re metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100043-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M43-1</b>
Rhenium	Re metal	1000 µg/mL	2% HCl	<b>100043-2</b>			
Rhodium	RhCl <sub>3</sub>	1000 µg/mL	10% HCl	<b>100044-2</b>	10 mg/mL	10% HCl	<b>10M44-2</b>
Rubidium	RbNO <sub>3</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100045-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M45-1</b>
Rubidium	Rb <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HCl	<b>100045-2</b>	10 mg/mL	1% HCl	<b>10M45-2</b>
Ruthenium	(NH <sub>4</sub> ) <sub>2</sub> RuCl <sub>6</sub>	1000 µg/mL	2% HCl	<b>100046-2</b>	10 mg/mL	5% HCl	<b>10M46-2</b>
Samarium	Sm <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100047-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M47-1</b>
Samarium	Sm <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100047-2</b>	10 mg/mL	4% HCl	<b>10M47-2</b>
Scandium	Sc <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100048-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M48-1</b>
Scandium	Sc <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100048-2</b>	10 mg/mL	10% HCl	<b>10M48-2</b>
Selenium	Se metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100049-1</b>	10 mg/mL	10% HNO <sub>3</sub>	<b>10M49-1</b>
Selenium	Se metal	1000 µg/mL	2% HCl	<b>100049-2</b>	10 mg/mL	10% HCl	<b>10M49-2</b>
Silicon	Na <sub>2</sub> SiO <sub>3</sub>	1000 µg/mL	H <sub>2</sub> O	<b>100050-4</b>	10 mg/mL	H <sub>2</sub> O	<b>10M50-4</b>
Silicon	(NH <sub>4</sub> ) <sub>2</sub> SiF <sub>6</sub>	1000 µg/mL	H <sub>2</sub> O	<b>100050-4F</b>	10 mg/mL	H <sub>2</sub> O	<b>10M50-4F</b>
Silica	(NH <sub>4</sub> ) <sub>2</sub> SiF <sub>6</sub>	1000 µg/mL	H <sub>2</sub> O	<b>1000SI02-4F</b>			
Silver	Ag metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100051-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M51-1</b>
Sodium	Na <sub>2</sub> CO <sub>3</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100052-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M52-1</b>
Sodium	NaCl	1000 µg/mL	1% HCl	<b>100052-2</b>	10 mg/mL	1% HCl	<b>10M52-2</b>
Strontium	Sr(NO <sub>3</sub> ) <sub>2</sub>	1000 µg/mL	1% HNO <sub>3</sub>	<b>100053-1</b>	10 mg/mL	1% HNO <sub>3</sub>	<b>10M53-1</b>
Strontium	SrCO <sub>3</sub>	1000 µg/mL	2% HCl	<b>100053-2</b>	10 mg/mL	10% HCl	<b>10M53-2</b>
Sulfur	H <sub>2</sub> SO <sub>4</sub>	1000 µg/mL	H <sub>2</sub> O	<b>100054-5</b>	10 mg/mL	H <sub>2</sub> O	<b>10M54-5</b>
Tantalum	Ta metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.5% HF	<b>100055-3</b>	10 mg/mL	5% HNO <sub>3</sub> + 2% HF	<b>10M55-3</b>
Tellurium	Te metal	1000 µg/mL	20% HCl	<b>100056-2</b>	10 mg/mL	40% HCl	<b>10M56-2</b>

These standards are sold in our standard 100, 250, and 500 mL sizes.

# Single-Element Standards

Find this online @ [highpuritystandards.com/ses](http://highpuritystandards.com/ses)

Element	Source	Concentration	Matrix	Catalog No.	Concentration	Matrix	Catalog No.
Tellurium	Te metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.2% HF	<b>100056-3</b>	10 mg/mL	5% HNO <sub>3</sub> + 2% HF	<b>10M56-3</b>
Terbium	Tb <sub>4</sub> O <sub>7</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100057-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M57-1</b>
Terbium	Tb <sub>4</sub> O <sub>7</sub>	1000 µg/mL	2% HCl	<b>100057-2</b>	10 mg/mL	4% HCl	<b>10M57-2</b>
Thallium	Tl metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100058-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M58-1</b>
Thorium	ThO <sub>2</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100059-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M59-1</b>
Thorium	ThO <sub>2</sub>	1000 µg/mL	2% HCl	<b>100059-2</b>			
Thulium	Tm <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100060-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M60-1</b>
Thulium	Tm <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100060-2</b>	10 mg/mL	4% HCl	<b>10M60-2</b>
Tin	Sn metal	1000 µg/mL	20% HCl	<b>100061-2</b>	10 mg/mL	60% HCl	<b>10M61-2</b>
Tin	Sn metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.5% HF	<b>100061-3</b>	10 mg/mL	5% HNO <sub>3</sub> + 2% HF	<b>10M61-3</b>
Titanium	Ti metal	1000 µg/mL	20% HCl	<b>100062-2</b>	10 mg/mL	40% HCl	<b>10M62-2</b>
Titanium	Ti metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.1% HF	<b>100062-3</b>	10 mg/mL	5% HNO <sub>3</sub> + 2% HF	<b>10M62-3</b>
Tungsten	W metal	1000 µg/mL	2% HNO <sub>3</sub> + 1% HF	<b>100063-3</b>	10 mg/mL	5% HNO <sub>3</sub> + 2% HF	<b>10M63-3</b>
Uranium	U <sub>3</sub> O <sub>8</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100064-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M64-1</b>
Vanadium	NH <sub>4</sub> VO <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100065-1</b>	5 mg/mL	5% HNO <sub>3</sub>	<b>5M65-1</b>
Vanadium	NH <sub>4</sub> VO <sub>3</sub>	1000 µg/mL	2% HCl	<b>100065-2</b>	10 mg/mL	10% HCl	<b>10M65-2</b>
Vanadium	NH <sub>4</sub> VO <sub>3</sub>				10 mg/mL	10% HNO <sub>3</sub> + Tr HF	<b>10M65-3</b>
Ytterbium	Yb <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100066-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M66-1</b>
Ytterbium	Yb <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100066-2</b>	10 mg/mL	4% HCl	<b>10M66-2</b>
Yttrium	Y <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HNO <sub>3</sub>	<b>100067-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M67-1</b>
Yttrium	Y <sub>2</sub> O <sub>3</sub>	1000 µg/mL	2% HCl	<b>100067-2</b>	10 mg/mL	4% HCl	<b>10M67-2</b>
Zinc	Zn metal	1000 µg/mL	2% HNO <sub>3</sub>	<b>100068-1</b>	10 mg/mL	4% HNO <sub>3</sub>	<b>10M68-1</b>
Zinc	Zn metal	1000 µg/mL	2% HCl	<b>100068-2</b>	10 mg/mL	10% HCl	<b>10M68-2</b>
Zirconium	ZrO(NO <sub>3</sub> ) <sub>2</sub>	1000 µg/mL	0.5% HNO <sub>3</sub>	<b>100069-1</b>			
Zirconium	ZrOCl <sub>2</sub>	1000 µg/mL	2% HCl	<b>100069-2</b>	10 mg/mL	2% HCl	<b>10M69-2</b>
Zirconium	Zr metal	1000 µg/mL	2% HNO <sub>3</sub> + 0.5% HF	<b>100069-3</b>	10 mg/mL	4% HNO <sub>3</sub> + 2% HF	<b>10M69-3</b>

## Single-Element Dilutions

All single-element standards are available as dilutions at any concentration. Most economical pricing is available for 10 and 100 ppm standards. Visit [www.highpuritystandards.com](http://www.highpuritystandards.com) for items available for immediate shipment. Call Customer Service for pricing for other concentrations.

# ICP Multielement Standards

Find this online @ [highpuritystandards.com/icpms](http://highpuritystandards.com/icpms)

The multielement standards listed on the next several pages are prepared from high-purity metals or salts in subboiling distilled acids. We have listed only our most popular items. Please refer to our website or CD catalog for a complete list. If you still do not find what you need, we will be pleased to provide a quotation. Refer to page 4 for more information.

The uncertainty of the standards is certified to  $\pm 0.5\%$  of the stated concentrations against NIST SRM Spectrometric Standard Solutions. Each standard is accompanied by a Certificate of Analysis and a Material Safety Data Sheet.

Standards are certified accurate for a period of one year from the date of shipment.

## ICP Working Calibration Solutions

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-WS-1</b>	Al	10 $\mu\text{g/mL}$	Pb	10 $\mu\text{g/mL}$	Sn	10 $\mu\text{g/mL}$	2% $\text{HNO}_3$ + Tr HF
	Sb	10	Mo	10	Ti	10	
	As	10	Se	10	Zn	10	
	Be	1	Ag	1			
	Fe	10	Tl	10			
<b>ICP-WS-2</b>	Ba	10	Cr	10	Ni	10	2% $\text{HNO}_3$
	Bi	10	Co	10	K	50	
	B	10	Cu	10	Na	50	
	Cd	10	Mg	50	Sr	10	
	Ca	50	Mn	10	V	10	
<b>ICP-WS-3</b>	Au	10	Pd	10	Ru	10	5% HCl
	Ir	10	Pt	50	Te	50	
	Os	10	Rh	10			
<b>ICP-WS-4</b>	Ce	10	La	10	Tb	10	2% $\text{HNO}_3$
	Dy	10	Lu	10	Th	10	
	Er	10	Nd	10	Tm	10	
	Eu	10	Pr	10	U	10	
	Gd	10	Sm	10	Yb	10	
	Ho	10	Sc	10	Y	10	

## Wavelength Calibration Solution

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>WAVECAL</b>	As	20 $\mu\text{g/mL}$	Mo	20 $\mu\text{g/mL}$	Sc	20 $\mu\text{g/mL}$	2% HCl
	La	20	Ni	20	Na	20	
	Li	20	P	100	S	100	
	Mn	20	K	100			
<b>WAVECAL-2</b>	Al	50	Cr	50	Mn	50	5% $\text{HNO}_3$
	As	50	Co	50	Mo	50	
	Ba	50	Cu	50	Ni	50	
	Cd	50	Pb	50	K	500	
	Se	50	Sr	50	Zn	50	

These standards are sold in our standard 100, 250, and 500 mL sizes.

# ICP Multielement Standards

Find this online @ [highpuritystandards.com/icpam](http://highpuritystandards.com/icpam)

## ICP Analytical Mixtures

HPS analytical mixtures are designed to calibrate the instrument response or as a quality control check for the analysis of geological, wastewater, air particulate, soil, plant, and animal tissue samples.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-AM-1</b>	Ba	25 µg/mL	Mo	50 µg/mL	Mg	100 µg/mL	Na	500 µg/mL	2% HNO <sub>3</sub> + Tr HF
	Ca	250	K	500					
<b>ICP-AM-2</b>	Sb	200	B	100	Ag	200	Tl	200	2% HNO <sub>3</sub> + Tr HF
<b>ICP-AM-3</b>	Al	100	Co	100	Hg	5	Cr	100	2% HNO <sub>3</sub>
	As	50	Cu	100	Ni	50	Mn	100	
	Be	10	Fe	50	Se	50	Zn	100	
	Cd	100	Pb	100	V	100			
<b>ICP-AM-4</b>	Sb	100	Se	100	Sn	100	Mg	100	20% HCl
	Ca	100	Na	100	Te	100	S	100	
<b>ICP-AM-5</b>	Al	100	Cr	100	Pb	100	Zn	100	5% HCl
	As	100	Co	100	Mn	100			
	Ba	100	Cu	100	Ni	100			
	Be	100	Fe	100	Cd	100			
<b>ICP-AM-6</b>	Al	100	Co	100	K	100	Cr	100	4% HNO <sub>3</sub> + Tr HF
	Sb	100	Cu	100	Si	100	Ni	100	
	Ba	100	Fe	100	Ag*	100	Zn	100	*Solution B 4% HNO <sub>3</sub>
	Be	100	Pb	100	Na	100	Ca	100	
	B	100	Li	100	Sr	100	Mn	100	
	Cd	100	Mg	100	Tl	100	V	100	
<b>ICP-AM-7</b>	As	1000	Cd	250	Pb	1000	Se	250	4% HNO <sub>3</sub>
	Ba	10,000	Cr	1000	Hg*	50	Ag	1000	*Sol B - 5% HNO <sub>3</sub>
<b>ICP-AM-10</b>	Al	1000	Fe	2500	Mg	5000			4% HNO <sub>3</sub>
	Ca	10,000	Mn	2500					
<b>ICP-AM-11</b>	Sb	1000	Si	2000	Mo	200			4% HNO <sub>3</sub> + 1% HF
	B	1000	Sn	1000	Ti	200			
<b>ICP-AM-12</b>	Al	100	Co	100	Se	100	Cd	100	4% HNO <sub>3</sub> + Tr HF
	Sb	100	Cu	100	Tl	100	Mo	100	
	As	100	Pb	100	V	100	Th*	100	*Solution B 4% HNO <sub>3</sub>
	Be	100	Mn	100	Zn	100	Cr	100	
	Ni	100	U	100					
<b>ICP-AM-15</b>	Ca	10,000	Mg	10,000	K	10,000	Na	10,000	5% HNO <sub>3</sub>
<b>ICP-AM-15-5M</b>	Ca	5,000	Mg	5,000	K	5,000	Na	5,000	5% HNO <sub>3</sub>
<b>ICP-AM-15-1M</b>	Ca	1,000	Mg	1,000	K	1,000	Na	1,000	2% HNO <sub>3</sub>
<b>ICP-AM-16</b>	Ca	1000	Mg	1000	K	1000	Na	1000	5% HNO <sub>3</sub>
	Fe	1000							

# ICP Multielement Standards

Find this online @ [highpuritystandards.com/icpms](http://highpuritystandards.com/icpms)

## Initial Check Verification Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICV-1</b>	Al	100 µg/mL	Cu	100 µg/mL	K	200 µg/mL	4% HNO <sub>3</sub> + Tr HF  *Solution B H <sub>2</sub> O
	As	100	Fe	100	Se	200	
	Ba	50	Pb	100	Si*	100	
	Be	50	Li	100	Na*	162	
	Bi	100	Mg	100	S*	200	
	B	100	Mn	50	Sr	100	
	Cd	50	Mo	100	Tl	100	
	Ca	100	Ni	100	V	50	
	Cr	50	P	200			
	Co	50	Zn	50			
<b>ICV-2</b>	Sb	100	Sn	100	Ti	100	15% HCl
<b>ICV-3</b>	Au	50	Pd	50	Pt	50	2% HCl
<b>ICV-4</b>	Al	200	Co	50	K	5000	4% HNO <sub>3</sub> + Tr HF
	Sb	60	Cu	25	Se	5	
	As	10	Fe	100	Ag	10	
	Ba	200	Pb	5	Na	5000	
	Be	5	Mg	5000	Tl	10	
	Cd	5	Mn	15	V	50	
	Ca	5000	Ni	40			
	Cr	10	Zn	20			

## Continuing Check Verification Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix		
<b>CCV-1</b>	Al	200 µg/mL	Cu	200 µg/mL	K	500 µg/mL	4% HNO <sub>3</sub> + Tr HF  *Solution B H <sub>2</sub> O		
	As	200	Fe	200	Se	200			
	Ba	100	Pb	200	Si*	500			
	Be	100	Li	200	Na*	810			
	Bi	200	Mg	200	S*	500			
	B	200	Mn	100	Sr	200			
	Cd	100	Mo	200	Tl	200			
	Ca	200	Ni	200	V	100			
	Cr	50	P	500					
	Co	100	Zn	100					
	<b>CCV-2</b>	Sb	200	Sn	200	Ti		200	15% HCl
	<b>CCV-3</b>	Au	100	Pd	100	Pt		100	2% HCl

These standards are sold in our standard 100, 250, and 500 mL sizes.

# ICP Multielement Standards

Find this online @ [highpuritystandards.com/epa2007](http://highpuritystandards.com/epa2007)

## EPA Method 200.7 Calibration Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-200.7-1</b>	Al	1000 µg/mL	Mg	1000 µg/mL	Ag*	500 µg/mL	2% HNO <sub>3</sub>
	Ca	1000	Ni	500	Na	1000	*Solution B
	Cr	500	K	1000	Zn	500	2% HNO <sub>3</sub>
<b>ICP-200.7-2</b>	Ba	100	Cu	100	Sr	1000	2% HNO <sub>3</sub>
	Be	100	Fe	1000	V	100	
	Co	200	Mn	100			
<b>ICP-200.7-4</b>	Sb	1000	Mo	1000	Ti	1000	4% HNO <sub>3</sub> + Tr HF
<b>ICP-200.7-5</b>	Al	25	Cu	25	Se	25 µg/mL	2% HNO <sub>3</sub> + Tr HF
	Sb	25	Fe	25	Si	25	
	As	25	Pb	25	Ag	2.5	
	Ba	25	Li	25	Sr	25	
	Be	5	Mn	25	Tl	25	
	B	25	Hg	5	Sn	10	
	Cd	10	Mo	10	V	10	
	Cr	25	Ni	25	Zn	25	
	Co	10	P	50			
<b>ICP-200.7-6</b>	Al	20	Cu	20	K	100	2% HNO <sub>3</sub> + Tr HF
	Sb	20	Fe	20	Se	20	
	As	20	Pb	20	Si	100	
	Ba	20	Li	20	Ag	5	
	Be	20	Mg	20	Na	20	
	B	20	Mn	20	Sr	20	
	Cd	20	Hg*	20	Tl	20	
	Ca	20	Mo	20	Sn	20	
	Cr	20	Ni	20	V	20	
	Co	20	P	100	Zn	20	
<b>ICP-200.7-8</b>	Al	200	Co	50	Ni	50	2% HNO <sub>3</sub> + Tr HF
	Ba	50	Cr	50	Sn	50	
	Be	50	Cu	50	SiO <sub>2</sub>	50	
	Cd	50	Fe	300	Ti	50	
	Ca	50	Mn	50	Tl	50	
			Mo	50	V	50	

# ICP Multielement Standards

Find this online @ [highpuritystandards.com/icpms](http://highpuritystandards.com/icpms)

## Interference Check Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>INFCS-1</b>	As	1000 µg/mL	Cu	300 µg/mL	Se	500 µg/mL	Co	300 µg/mL	4% HNO <sub>3</sub>  *Solution B
	Ba	300	Pb	1000	Ag*	300	K	20,000	
	Be	100	Mn	200	Tl	1000			
	Cd	300	Hg	50	V	300			
	Cr	300	Ni	300	Zn	300			
<b>INFCS-4</b>	Al	5000	Fe	5000	Ca	5000	Mg	5000	5% HNO <sub>3</sub>
<b>INFCS-5</b>	K	5000	Na	5000					2% HCl
<b>INFCS-6</b>	Al	1200	Mg	3000	Fe	5000	Na	1000	4% HNO <sub>3</sub>
	Ca	6000							

## ICP Stock Solution

This stock solution is used to prepare working calibration standards and instrument performance check standards. The working calibration solutions are prepared from the stock solutions by making 100-, 20- and 10- fold dilutions. The working matrix is 1% HNO<sub>3</sub>. To prepare an instrument check standard, the stock solution is diluted 40 fold in 1% HNO<sub>3</sub>.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-SS</b>	Al	100 µg/mL	Co	20 µg/mL	Si	500 µg/mL	Se	50	2% HNO <sub>3</sub> + Tr HF
	Sb	50	Cu	20	Ag	1.5	Ca	2000	
	As	25	Fe	100	Na	2000	K	150	
	Ba	20	Pb	25	Sr	100	Zn	100	
	Be	20	Mg	500	Tl	10	Cr	20	
	B	20	Mn	20	Sn	20			
	Cd	20	Ni	20	V	20			

## ICP-RCRA

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-RCRA-1</b>	As	1000 µg/mL	Cr	1000 µg/mL	Ni	1000 µg/mL	5% HNO <sub>3</sub>
	Ba	1000	Cu	1000	Zn	1000	
	Cd	1000	Pb	1000			
<b>ICP-RCRA-2</b>	Ag	100 µg/mL	Cd	100 µg/mL	Pb	100 µg/mL	5% HNO <sub>3</sub>
	As	100	Cr	100	Se	100	
	Ba	100	Hg	100			

These standards are sold in our standard 100, 250, and 500 mL sizes.

# ICP Multielement Standards

Find this online @ [highpuritystandards.com/qcs](http://highpuritystandards.com/qcs)

## Quality Control Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>QCS-1</b>	Al	100 µg/mL	Ca	100 µg/mL	Mn	100 µg/mL	Si	100 µg/mL	4% HNO <sub>3</sub> + Tr HF  * Solution B in H <sub>2</sub> O
	As	100	Cr	100	Mo	100	S *	100	
	Ba	100	Co	100	Ni	100	U	100	
	Be	100	Fe	100	P	100	V	100	
	B	100	Li	100	K	100	Y	500	
	Cd	100	Mg	100	Se	100	Zn	100	
	Sb	100	Sn	100	Na	100	Y	500	
<b>QCS-2</b>	Sb	100	Sn	100	Na	100	Y	500	5% HCl
	<b>QCS-3</b>	Cu	100	Ag	100	Y	500	Pb	
	Tl	100							
<b>QCS-7</b>	Al	100	B	100	Si	50	Na	100	2% HNO <sub>3</sub>
	Ag	100	Ba	100	K	1000			
<b>QCS-7-M</b>	Al	100	B	100	Si	100	Na	100	2% HNO <sub>3</sub>
	Ag	50	Ba	100	K	1000			
<b>QCS-19</b>	Sb	100	Cr	100	Mg	100	Tl	100	4% HNO <sub>3</sub> + Tr HF
	As	100	Co	100	Mn	100	Ti	100	
	Be	100	Cu	100	Mo	100	V	100	
	Cd	100	Fe	100	Ni	100	Zn	100	
	Ca	100	Pb	100	Se	100			
<b>QCS-21</b>	Sb	100	Co	100	Mn	100	Ti	100	4% HNO <sub>3</sub> + Tr HF
	As	100	Cu	100	Mo	100	V	100	
	Be	100	Fe	100	Ni	100	Zn	100	
	Cd	100	Pb	100	Se	100			
	Ca	100	Li	100	Sr	100			
	Cr	100	Mg	100	Tl	100			
<b>QCS-26</b>	Al	100	Cd	100	Mn	100	Si	50	4% HNO <sub>3</sub> + Tr HF
	Sb	100	Co	100	Mo	100	Tl	100	
	As	100	Cr	100	Na	100	Ti	100	
	B	100	Cu	100	Ni	100	V	100	
	Ba	100	Fe	100	Pb	100	Zn	100	
	Be	100	K	1000	Se	100			
	Ca	100	Mg	100	Ag	100			
<b>QCS-27</b>	Al	100	Cd	100	Mn	100	Na	100	4% HNO <sub>3</sub> + Tr HF
	Sb	100	Co	100	Mo	100	Sr	100	
	As	100	Cr	100	K	100	Tl	100	
	B	100	Cu	100	Ni	100	Ti	100	
	Ba	100	Fe	100	Se	100	V	100	
	Be	100	Pb	100	Si	100	Zn	100	
	Ca	100	Mg	100	Ag	100			

# Contract Laboratory Program

Find this online @ [highpuritystandards.com/clp](http://highpuritystandards.com/clp)

## CLP Calibration Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>CLP-CAL-1</b>	Al	2000 µg/mL	Cu	250 µg/mL	Ni	500 µg/mL	Co	500	4% HNO <sub>3</sub>  *Solution B
	Ba	2000	Fe	1000	Na	5000	Cr	200	
	Be	50	K	5000	Ag*	250	Mn	500	
	Ca	5000	Mg	5000	V	500	Zn	500	
<b>CLP-CAL-2</b>	Sb	1000							5% Tartaric Acid + 2% HNO <sub>3</sub>
<b>CLP-CAL-3</b>	As	1000	Se	1000	Pb	1000	Cd	500	2% HNO <sub>3</sub>
	Tl	1000							

## CLP Check Verification Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>CLP-CV-1</b>	Al	1000 µg/mL	Cu	125 µg/mL	Ni	250 µg/mL			4% HNO <sub>3</sub>
	Ba	1000	Fe	500	Ag	125			
	Be	25	K	2500	Na	2500			
	Ca	2500	Mg	2500	V	250			
	Cr	100	Mn	250	Zn	250			
	Co	250							
<b>CLP-CV-2</b>	Sb	500							2% HNO <sub>3</sub> + Tr HF
<b>CLP-CV-3</b>	As	500	Cd	250	Pb	500	Se	500	2% HNO <sub>3</sub>
	Tl	500							

## CLP Interference Check Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>CLP-INF-1</b>	Al	5000 µg/mL	Ca	5000 µg/mL	Fe	2000 µg/mL	Mg	5000 µg/mL	5% HNO <sub>3</sub>

Any multielement standard in the HPS Catalog can be modified to meet your needs.  
Call (843) 767-7900 to discuss your needs with our staff.

These standards are sold in our standard 100, 250, and 500 mL sizes.

# Contract Laboratory Program

Find this online @ [highpuritystandards.com/clp](http://highpuritystandards.com/clp)

## CLP Spike Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>CLP-SP-1</b>	Al	2000 µg/mL	Co	500 µg/mL	Ni	500 µg/mL	Cr	200	4% HNO <sub>3</sub>
	Ba	2000	Cu	250	Ag*	50	Mn	500	
	Be	50	Fe	1000	V	500	Zn	500	
<b>CLP-SP-2</b>	Sb	500							*Solution B 5% Tartaric Acid + 2% HNO <sub>3</sub>
<b>CLP-SP-3</b>	As	2000	Se	2000	Cd	50	Tl	2000	4% HNO <sub>3</sub>
	Pb	500							

## CLP Analyte Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ANALCS</b>	Ba	50 µg/mL	Co	50 µg/mL	Ni	100 µg/mL	V	50 µg/mL	2% HNO <sub>3</sub>
	Be	50	Cu	50	Ag	100	Pb	100	
	Cd	100	Cr	50	Mn	50	Zn	100	
<b>ANALCS-R</b>	Sb	60	Cu	50	Se	5			2% HNO <sub>3</sub> + Tr HF
	As	10	Co	50	Ag	20	Cr	50	
	Ba	50	Pb	5	Tl	10	Zn	100	
	Be	50	Mn	50	V	50	Ni	100	
	Cd	100							

## CRDL Detection Limit Standard

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>CRDL</b>	Sb	120 µg/mL	Co	100 µg/mL	Se	10 µg/mL	Cr	20	2% HNO <sub>3</sub> + Tr HF
	As	20	Cu	50	Ag	20	Ni	80	
	Be	10	Pb	6	Tl	20	Zn	40	
	Cd	10	Mn	30	V	100			

Please visit us at [www.highpuritystandards.com](http://www.highpuritystandards.com) to see a complete listing of our multielement ICP products.

# ICP Single-Element Kits

## ICP Starter Kits [Find this online @ highpuritystandards.com/icpsk](http://highpuritystandards.com/icpsk)

These kits are designed for ICP to provide the analyst with a modest supply of high-purity single-element spectrometric standard solutions. Individual kits are designed to meet the analyst's needs for a variety of environmental and industrial applications. **Each kit contains individual 100 or 250 mL bottles of the listed elements at 1000.** The complete kit, ICP-KIT-A-E, contains all 60 single-element solutions listed below.

Catalog No.	1000 µg/mL										Matrix
ICP-KIT-A	Al	Be	Ca	Cu	Pb	Hg	Se	Na	V		2-5% HNO <sub>3</sub>
	As	Bi	Cr	In	Mg	Ni	Si**	Sr	Zn		
	Ba	Cd	Co	Fe	Mn	K	Ag	Tl			
	Sb	Mo	Nb	Ta	Sn	Te	Ti	W	Zr		
ICP-KIT-B	Hf										** (NH <sub>4</sub> ) <sub>2</sub> SiF <sub>6</sub> in H <sub>2</sub> O 2-5% HNO <sub>3</sub> + HF
ICP-KIT-C	B	P	S								H <sub>2</sub> O
ICP-KIT-D	Au	Pd	Pt								2-5% HCl
ICP-KIT-E	Ce	Er	Gd	La	Nd	Sm	Tb	Yb	Th		2% HNO <sub>3</sub>
	Dy	Eu	Ho	Lu	Pr	Sc	Tm	Y	U		
ICP-KIT-A-E	Complete ICP Starter Kit (Includes all of the above kits)										

## ICP-MS Starter Kits [Find this online @ highpuritystandards.com/icpmsk](http://highpuritystandards.com/icpmsk)

These kits are designed for ICP-MS to provide the analyst with a modest supply of high-purity single-element spectrometric standard solutions. Individual kits are designed to meet the analyst's needs for a variety of environmental and industrial applications. **Each kit contains individual 100 mL bottles of the listed elements at 10 µg/mL.** The complete kit, ICP-MS-KIT-A-E, contains all 74 single-element solutions listed below.

For a standard containing most of these elements as a multielement mix, please reference ICP-MS-68A on page 21.

Catalog No.	10 µg/mL										Matrix
ICP-MS-KIT-A	Al	Bi	Cs	Ga	Pb	Hg	Re	Ag	Tl		2-5% HNO <sub>3</sub>
	As	B	Cr	Ge	Li	Ni	Rb	Na	Th		
	Ba	Cd	Co	In	Mg	P	Se	Sr	U		
	Be	Ca	Cu	Fe	Mn	K	Si**	S	V		
									Zn		
ICP-MS-KIT-B	Sb	Hf	Mo	Nb	Ta	Sn	Te	Ti	W		2% HNO <sub>3</sub> + Tr HF
									Zr		
ICP-MS-KIT-C	Au	Ir	Os	Pd	Pt	Rh	Ru				2% HCl
ICP-MS-KIT-D	Ce	Er	Gd	La	Nd	Sm	Tb	Yb			2% HNO <sub>3</sub>
	Dy	Eu	Ho	Lu	Pr	Sc	Tm	Y			
ICP-MS-KIT-E	Br	Cl	F	I							H <sub>2</sub> O
ICP-MS-KIT-A-E	Complete ICP-MS Starter Kit (Includes all of the above kits)										

## Trace Metals on Filter Media for Industrial Hygiene and Ambient Air Analysis

High-Purity Standards offers a wide range of standards for trace metals on filter media. Custom standards of metals in acid matrices or in natural matrices such as soil, coal dust, etc. can be prepared. These standards can be deposited on mixed cellulose esters, PTFE, glass, or quartz filters. Contact us for a quotation.

The following trace metals on mixed cellulose ester are designed to meet the QC requirements for Method 7300. The trace metals on PTFE are designed to meet the requirements of EPA IO methods. Additional blanks are available upon request.

Catalog No.								
QC-TMFM-A-G	Trace metals on mixed cellulose ester; 10 spiked filters + 5 blanks							
QC-PTFE-A-G	Trace metals on PTFE; 5 spiked filters + 2 blanks							
	A	B	C	D	E	F	G	
Element $\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	$\mu\text{g} / \text{filter}$	
Aluminum	--	--	--	50	100	--	--	
Arsenic	10	50	100	10	20	10	50	
Barium	2.5	10	25	2.5	5	2.5	10	
Beryllium	1	10	25	0.1	0.2	1	10	
Cadmium	1	10	25	1	2	1	10	
Chromium	2.5	10	25	2.5	5	2.5	10	
Cobalt	2.5	10	25	2.5	5	2.5	10	
Copper	2.5	25	50	2.5	5	2.5	25	
Iron	2.5	25	50	2.5	5	2.5	25	
Lead	2.5	25	50	2.5	5	2.5	25	
Manganese	1	10	25	1	2	1	10	
Nickel	2.5	10	25	2.5	5	2.5	10	
Silver	1	5	10	1	2	1	5	
Thallium	2.5	10	25	2.5	5	2.5	10	
Uranium						2.5	5	
Vanadium	2.5	10	25	2.5	5	2.5	10	
Zinc	2.5	50	100	2.5	5	2.5	50	

The following trace metals on quartz filters are designed to meet the QC requirements of EPA IO methods.

Catalog No.	Element Conc.	Element Conc.	Element Conc.	Element Conc.	Media
QC-TOXM-B	Sb 10 $\mu\text{g}$	Cd 10 $\mu\text{g}$	Mn 10 $\mu\text{g}$	Be 10 $\mu\text{g}$	Quartz QM-A grade filter
	As 50	Cr 10	Ni 10	Pb 25	

The above items include dissolved metals on filters. High-Purity Standards offers a line of high-fired beryllium oxide solids on mixed cellulose ester filters. These products include two options for source material: industrial-grade, fine particle or the highly-characterized source of BeO, using NIST SRM® 1877. Concentrations range from 0.05 to 25  $\mu\text{g}/\text{filter}$ .

Catalog No.	Catalog No.
TMFM-BEO	High-fired BeO source; 3 spike filters/set
TMFM-CBEO	NIST BeO source; 2 spiked filters/set
TMFM-BEO-BLANK	Blank filters for TMFM-BEO
TMFM-CBEO-BLANK	Blank filters for TMFM-CBEO

# ICP-MS Multielement Standards

Find this online @ [highpuritystandards.com/icpmsms](http://highpuritystandards.com/icpmsms)

## ICP-MS Calibration Standards

The following solutions include elements chosen to calibrate the ICP-MS over the entire mass spectrum. These multielement standards are designed to assist the analyst in the verification of the mass range.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-MSCS</b>	Al	10 µg/mL	Cr	10 µg/mL	Mg	10 µg/mL	Sr	10 µg/mL	2% HNO <sub>3</sub> + Tr HF
	Sb	10	Cu	10	Mn	10	Tl	10	
	As	10	Co	10	Mo	10	Th	10	
	Ba	10	Eu	10	Ni	10	U	10	
	Be	10	Ho	10	Sc	10	V	10	
	B	10	La	10	Se	10	Yb	10	
	Cd	10	Pb	10	Ag	10	Zn	10	
	Ca	10	Li	10	Na	10			
<b>ICP-MSCS-M</b>	Al	10	Ca	10	Li	10	Na	10	2% HNO <sub>3</sub> + Tr HF
	Sb	10	Cr	10	Mg	10	Sr	10	
	As	10	Cu	10	Mn	10	Tl	10	
	Ba	10	Co	10	Mo	10	Th	10	
	Be	10	Eu	10	Ni	10	V	10	
	Bi	10	Ho	10	Fe	10	U	10	
	B	10	La	10	Se	10	Yb	10	
	Cd	10	Pb	10	Ag	10	Zn	10	

## Interference Check Solutions

These solutions contain known concentrations of elements that will demonstrate the magnitude of interference and provide adequate tests for many corrections. (ICP-MS-ICS Solution AB includes all elements of A plus the additional ones listed.)

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-MS-ICS Solution A</b>	Al	500 mg/L	Mg	500 mg/L	K	500 mg/L	Cl	3600 mg/L	2% HNO <sub>3</sub> + Tr HF
	Ca	500	Na	500	S	500	Mo	10	
	Fe	500	P	500	C	1000	Ti	10	
<b>Solution AB</b>	Cr	0.10	Ni	0.20	Ag	0.10			2% HNO <sub>3</sub> + Tr HF
	As	0.10	Co	0.20	Mn	0.10	V	0.20	
	Cd	0.05	Cu	0.10	Se	0.10	Zn	0.10	
<b>ICP-MS-ICS-2 Solution A</b>	Al	1000	Mg	1000	K	1000	Cl	20,000	5% HNO <sub>3</sub> + Tr HF
	Ca	3000	Na	2500	S	1000	Mo	20	
	Fe	2500	P	1000	C	2000	Ti	20	
<b>Solution B</b>	Cr	20	Ni	20	Ag	5	Zn	10	2% HNO <sub>3</sub>
	As	10	Co	20	Mn	20	V	20	
	Cd	10	Cu	20	Se	10			

These standards are sold in our standard 100, 250, and 500 mL sizes.

# ICP-MS Multi-element Standards

Find this online @ [highpuritystandards.com/icpmsms](http://highpuritystandards.com/icpmsms)

## ICP-MS Verification Standards

The following series of ICP-MS standards are used as concentration verification checks.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-MS-B</b>	Ce	10 µg/mL	Ho	10 µg/mL	Sm	10 µg/mL	Yb	10 µg/mL	2% HNO <sub>3</sub>
	Dy	10	La	10	Sc	10	Y	10	
	Er	10	Lu	10	Tb	10			
	Eu	10	Nd	10	Th	10			
	Gd	10	Pr	10	Tm	10			
<b>ICP-MS-C</b>	Sb	10	Ir	10	Rh	10	Te	10	10% HCl
	Au	10	Pd	10	Ru	10			
	Hf	10	Pt	10	Sn	10			
<b>ICP-MS-D</b>	B	10	Nb	10	S	10	Ti	10	2% HNO <sub>3</sub> + Tr HF
	Ge	10	P	10	Si	10	W	10	
	Mo	10	Re	10	Ta	10	Zr	10	
<b>ICP-MS-E</b>	Ag	10	Co	10	Li	10	Se	10	2% HNO <sub>3</sub>
	Al	10	Cr	10	Mg	10	Sr	10	
	As	10	Cs	10	Mn	10	Tl	10	
	Ba	10	Cu	10	Na	10	U	10	
	Be	10	Fe	10	Ni	10	V	10	
	Ca	10	Ga	10	Pb	10	Zn	10	
	Cd	10	K	10	Rb	10			

## ICP-MS Method 6020

When the following solution is diluted 100-fold, the Contract Required Detection Limits (CRDL) of the elements approved for ICP-MS Method 6020 CLP-M are met.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-MS-6020</b>	Al	200 µg/L	Co	50 µg/L	K	5000 µg/L	Cr	10 µg/L	4% HNO <sub>3</sub> + Tr HF
	Sb	60	Cu	25	Se	5	Ca	5000	
	As	10	Fe	100	Ag	10	Ni	40	
	Ba	200	Pb	5	Na	5000	Zn	20	
	Be	5	Mg	5000	Tl	10			
	Cd	5	Mn	15	V	50			

# ICP-MS Multielement Standards

Find this online @ [highpuritystandards.com/icpmsms](http://highpuritystandards.com/icpmsms)

## Tuning Solutions

The following solutions include elements chosen to calibrate the ICP-MS over the entire mass spectrum. These multielement standards are designed to assist the analyst in the verification of the mass range.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-MS-TS-1</b>	Li	10 µg/mL	Co	10 µg/mL	In	10 µg/mL	Tl	10 µg/mL	2% HNO <sub>3</sub>
<b>ICP-MS-TS-2</b>	Li	10	Ce	10	Tl	10	Y	10	2% HNO <sub>3</sub>
<b>ICP-MS-TS-3</b>	Be	10	Co	10	In	10	Pb	10	2% HNO <sub>3</sub>
	Mg	10							
<b>ICP-MS-TS-4</b>	Al	10	Bi	10	In	10	Ni	10	2% HNO <sub>3</sub>
	Ba	10	Ce	10	Pb	10	V	10	
	Be	10	Co	10	Mg	10	Y	10	
<b>ICP-MS-TS-5</b>	Bi	10	In	10	Sc	10	U	10	2% HNO <sub>3</sub>
	Ho	10	6Li	10	Tb	10	Y	10	
<b>ICP-MS-TS-6</b>	Ba	10	Ce	10	In	10	Mg	10	2% HNO <sub>3</sub> + Tr HCl
	Be	10	Co	10	Pb	10	Rh	10	

## EPA Method 200.8 Calibration Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-200.8-1</b>	Al	10 µg/mL	Cr	10 µg/mL	Ni	10 µg/mL	V	10 µg/mL	2% HNO <sub>3</sub> + Tr HF
	Sb	10	Co	10	Se	10	Zn	10	
	As	10	Cu	10	Ag	10	Cd	10	
	Ba	10	Pb	10	Tl	10	Mo	10	
	Be	10	Mn	10	Th	10	U	10	
<b>ICP-200.8-2</b>	Al	10	Cr	10	Ni	10	V	10	2% HNO <sub>3</sub> + Tr HF
	Sb	10	Co	10	Se	50	Zn	10	
	As	10	Cu	10	Ag	10	Cd	10	
	Ba	10	Pb	10	Tl	10	Mo	10	
	Be	10	Mn	10	Th	10	U	10	
<b>ICP-200.8-3</b>	Al	20	Cr	20	Ni	20	V	20	2% HNO <sub>3</sub>
	Sb*	20	Co	20	Se	100	Zn	20	
	As	20	Cu	20	Ag	20	Cd	20	*Solution B
	Ba	20	Pb	20	Tl	20	Mo *	20	2% HNO <sub>3</sub> + Tr HF
	Be	20	Mn	20	Th	20	U	20	

These standards are sold in our standard 100, 250, and 500 mL sizes.

# ICP-MS Multielement Standards

Find this online @ [highpuritystandards.com/icpmsms](http://highpuritystandards.com/icpmsms)

## 68-Element Standard

These 3-standard kits were designed for use when screening for a large number of elements. They are offered at two concentrations: 10 µg/mL (68A) and 100 µg/mL (68B). They may be purchased as a kit or their individual standards may be purchased separately. Volumes of 100, 250 and 500 mL are stocked.

Solution	Element	Element	Element	Element	Element	Element	Element
<b>Solution A</b> ICP-MS-68A in 2% HNO <sub>3</sub> ICP-MS-68B in 4% HNO <sub>3</sub>	Al	As	Ba	Be	Bi	B	Ca
	Cd	Ce	Co	Cr	Cs	Cu	Dy
	Er	Eu	Ga	Gd	Ho	In	Fe
	La	Pb	Li	Lu	Mg	Mn	Nd
	Ni	P	K	Pr	Re	Rb	Sm
	Sc	Se	Na	Sr	Tb	Tl	Th
	Tm	U	V	Yb	Y	Zn	
<b>Solution B</b> ICP-MS-68A in 2% HNO <sub>3</sub> + Tr HF ICP-MS-68B in 2% HNO <sub>3</sub> + Tr HF	Sb	Ge	Hf	Mo	Nb	Si	Ag
	Ta	Te	Sn	Ti	W	Zr	
<b>Solution C</b> ICP-MS-68A in 2% HNO <sub>3</sub> + Tr HCl ICP-MS-68B in 4% HNO <sub>3</sub> + 2% HCl	Au	Ir	Os	Pd	Pt	Rh	Ru

## ICP-MS Internal Standards

Below are two popular ICP-MS internal standard solutions. ICP-MS-IS-1 can be used with EPA Method 6020 and ICP-MS-IS-2 can be used with EPA Method 200.8.

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>ICP-MS-IS-1</b>	Bi	10 µg/mL	<sup>6</sup> Li	10 µg/mL	Rh	10 µg/mL	Tb	10 µg/mL	2% HNO <sub>3</sub> + Tr HCl
	Ho	10	Lu	10	Sc	10	Y	10	
	In	10							
<b>ICP-MS-IS-2</b>	Bi	100	Sc	100	Tb	100	Y	100	in 2% HNO <sub>3</sub>
	In	100							
<b>ICP-MS-IS-3</b>	Bi	10	In	10	Sc	10	Y	10	in 2% HNO <sub>3</sub>
	Ge	10	<sup>6</sup> Li	10	Tb	10			

These standards are sold in our standard 100, 250, and 500 mL sizes.

## Matrix Modifiers for Graphite Furnace

HPS Matrix Modifiers are designed for use with Graphite Furnace Atomic Absorption (GFAAS). A matrix modifier is added to the sample to prevent analyte loss during the ashing step by converting the analyte to a less volatile form.

Catalog No.	Description
<b>MM-9001</b>	0.1% NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> in 0.05% HNO <sub>3</sub>
<b>MM-9002</b>	1% NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> in 0.05% HNO <sub>3</sub>
<b>MM-9003</b>	10% NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> in 0.05% HNO <sub>3</sub>
<b>MM-9004</b>	20% NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> in 0.05% HNO <sub>3</sub>
<b>MM-9010</b>	0.1% Mg(NO <sub>3</sub> ) <sub>2</sub> in 1% HNO <sub>3</sub>
<b>MM-9011</b>	1% Mg(NO <sub>3</sub> ) <sub>2</sub> in 1% HNO <sub>3</sub>
<b>MM-9012</b>	5% Mg(NO <sub>3</sub> ) <sub>2</sub> in 1% HNO <sub>3</sub>
<b>MM-9020</b>	0.1% Pd in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9023</b>	0.5% Pd in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9021</b>	1% Pd in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9022</b>	2% Pd in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9030</b>	0.1% Ni(NO <sub>3</sub> ) <sub>2</sub> in 1% HNO <sub>3</sub>

Catalog No.	Description
<b>MM-9031</b>	1% Ni(NO <sub>3</sub> ) <sub>2</sub> in 1% HNO <sub>3</sub>
<b>MM-9032</b>	5% Ni(NO <sub>3</sub> ) <sub>2</sub> in 1% HNO <sub>3</sub>
<b>MM-9100</b>	1000 µg Pd/mL - 600 µg Mg(NO <sub>3</sub> ) <sub>2</sub> /mL in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9040</b>	0.1% NH <sub>4</sub> NO <sub>3</sub> in H <sub>2</sub> O
<b>MM-9041</b>	1% NH <sub>4</sub> NO <sub>3</sub> in H <sub>2</sub> O
<b>MM-9042</b>	5% NH <sub>4</sub> NO <sub>3</sub> in H <sub>2</sub> O
<b>MM-9101</b>	1500 µg Pd/mL - 1000 µg Mg(NO <sub>3</sub> ) <sub>2</sub> /mL in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9102</b>	750 µg Pd/mL - 500 µg Mg(NO <sub>3</sub> ) <sub>2</sub> /mL in 10% HNO <sub>3</sub> + Tr HCl
<b>MM-9110</b>	10,000 µg NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub> /mL - 500 µg Mg(NO <sub>3</sub> ) <sub>2</sub> /mL in 1% HNO <sub>3</sub>

## Ionization Buffers for Flame AAS

Ionization Buffers are used to increase the free electron population in flame emission or absorption and thereby suppress ionization interference effects of many ions in high temperature flames such as nitrous oxide - acetylene. While the alkali metals are known to be ionized at various degrees, many metals including aluminum and silicon are ionized to an appreciable extent in a nitrous oxide - acetylene flame. Ionization buffers are always recommended with the nitrous oxide - acetylene flame. It is of interest to note that the ionization potential of lanthanum (5.6 eV) is very close to that of lithium (5.39 eV). Therefore, lanthanum acts as an ionization buffer as well as a releasing agent for the alkaline earth metals, silicon, and aluminum. The cesium ionization buffer is recommended by the manufacturers of the ICP and AAS instrumentation.

Catalog No.	Description
<b>IB-CS-B1</b>	1% Cesium in 1% HNO <sub>3</sub>
<b>IB-CS-B5</b>	5% Cesium in 1% HNO <sub>3</sub>
<b>IB-LA-B5</b>	5% Lanthanum in 1% HNO <sub>3</sub> *
<b>IB-LA-A1</b>	1% Lanthanum in 1% HCl*
<b>IB-LA-A5</b>	5% Lanthanum in 1% HCl*

**\*Also used as releasing agents in flame AAS**



# Metallo-Organic Standards

Find this online @ [highpuritystandards.com/mos](http://highpuritystandards.com/mos)

## Single-Element Standards

The standards listed below are for determination of wear metals in oils and lubricants. The standards below can also be ordered in paraffin 20 Base Oil, 75 Base Oil, Soybean Oil, and Xylene. Blank oil standards are available as well.

Catalog No.	Element	Concentration	Weight
<b>ALOMS</b>	Aluminum	1000 µg/g	100 grams
<b>SBOMS</b>	Antimony	1000	100
<b>ASOMS</b>	Arsenic	50	100
<b>BAOMS</b>	Barium	1000	100
<b>BEOMS</b>	Beryllium	1000	100
<b>BIOMS</b>	Bismuth	1000	100
<b>BBOMS</b>	Boron	1000	100
<b>CDOMS</b>	Cadmium	1000	100
<b>CAOMS</b>	Calcium	1000	100
<b>CROMS</b>	Chromium	1000	100
<b>COOMS</b>	Cobalt	1000	100
<b>CUOMS</b>	Copper	1000	100
<b>INOMS</b>	Indium	1000	100
<b>FEOMS</b>	Iron	1000	100
<b>PBOMS</b>	Lead	1000	100
<b>LIOMS</b>	Lithium	1000	100
<b>MGOMS</b>	Magnesium	1000	100
<b>MNOMS</b>	Manganese	1000	100
<b>HGOMS</b>	Mercury	50	100
<b>MOOMS</b>	Molybdenum	1000	100
<b>NIOMS</b>	Nickel	1000	100
<b>PPOMS</b>	Phosphorus	1000	100
<b>KKOMS</b>	Potassium	1000	100
<b>SEOMS</b>	Selenium	50	100
<b>SIOMS</b>	Silicon	1000	100
<b>AGOMS</b>	Silver	1000	100
<b>NAOMS</b>	Sodium	1000	100
<b>SNOMS</b>	Tin	1000	100
<b>TIOMS</b>	Titanium	1000	100
<b>WWOMS</b>	Tungsten	1000	100
<b>VVOMS</b>	Vanadium	1000	100
<b>ZNOMS</b>	Zinc	1000	100
<b>BMOMS</b>	Base Mineral Oil		500 mL
<b>OMS-12</b>	Ag, Al, Cr, Cu, Fe, Mg, Na, Ni, Pb, Si, Sn, Ti all elements at 200 µg/g	Mineral Oil	100 g 200 g
<b>OMS-21</b>	Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Mo, Na, Ni, P, Pb, Si, Sn, Ti, V, Zn all elements at 200 µg/g	Mineral Oil	100 g 200 g

# Ion Chromatography Standards

Find this online @ [highpuritystandards.com/ics](http://highpuritystandards.com/ics)

## Single Component IC Standards

The following standards are prepared from high-purity salts in 18-megaohm water except where noted otherwise and packaged in high-density polyethylene bottles. Standards are certified accurate for a period of 18 months from the date of shipment, except where noted otherwise.

Component	Source	Concentration	Catalog No.	Concentration	Catalog No.
Acetate	Na Acetate	100 µg/mL	<b>IC-AC</b>	1000 µg/mL	<b>IC-AC-M</b>
‡ Ammonium	NH <sub>4</sub> Cl	100	<b>IC-NH</b>	1000	<b>IC-NH-M</b>
Bromide	NaBr	100	<b>IC-BR</b>	1000	<b>IC-BR-M</b>
Bromide	NaBr	10,000	<b>IC-BR-10M</b>		
Bromate	NaBrO <sub>3</sub>	100	<b>IC-BRO3</b>	1000	<b>IC-BRO3-M</b>
Calcium	CaCl <sub>2</sub>	100	<b>IC-CA</b>	1000	<b>IC-CA-M</b>
Chloride	NaCl	100	<b>IC-CL</b>	1000	<b>IC-CL-M</b>
Chloride	NaCl	10,000	<b>IC-CL-10M</b>		
† Chlorite	NaClO <sub>2</sub>	100	<b>IC-CLO2</b>	1000	<b>IC-CLO2-M</b>
Chlorate	NaClO <sub>3</sub>	100	<b>IC-CLO3</b>	1000	<b>IC-CLO3-M</b>
‡ Perchlorate	NaClO <sub>4</sub>	100	<b>IC-CLO4</b>	1000	<b>IC-CLO4-M</b>
‡ f Cyanide	KCN	100	<b>IC-CN</b>	1000	<b>IC-CN-M</b>
Fluoride	NaF	100	<b>IC-FF</b>	1000	<b>IC-FF-M</b>
Fluoride	NaF	10,000	<b>IC-FF-10M</b>		
† Formate	Na Formate	100	<b>IC-FM</b>	1000	<b>IC-FM-M</b>
Iodide	NaI	100	<b>IC-II</b>	1000	<b>IC-II-M</b>
‡ Lactate	Na Lactate	100	<b>IC-LAC</b>	1000	<b>IC-LAC-M</b>
Magnesium	MgCl <sub>2</sub>	100	<b>IC-MG</b>	1000	<b>IC-MG-M</b>
Nitrate	NaNO <sub>3</sub>	100	<b>IC-NO</b>	1000	<b>IC-NO-M</b>
Nitrate	NaNO <sub>3</sub>	10,000	<b>IC-NO-10M</b>		
‡ Nitrite	NaNO <sub>2</sub>	100	<b>IC-N</b>	1000	<b>IC-N-M</b>
‡ Nitrogen	NaNO <sub>2</sub>	100	<b>IC-NO2</b>	1000	<b>IC-NO2-M</b>
Nitrogen	NaNO <sub>3</sub>	100	<b>IC-NO3</b>	1000	<b>IC-NO3-M</b>
‡ Nitrogen	NH <sub>4</sub> Cl	100	<b>IC-NT</b>	1000	<b>IC-NT-M</b>
‡ Oxalate	Na Oxalate	100	<b>IC-OX</b>	1000	<b>IC-OX-M</b>
Phosphate	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	100	<b>IC-PP</b>	1000	<b>IC-PP-M</b>
Phosphate	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	10,000	<b>IC-PP-10M</b>		
Phosphate	KH <sub>2</sub> PO <sub>4</sub>	100	<b>IC-KPP</b>	1000	<b>IC-KPP-M</b>
Phosphorus	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	100	<b>IC-P</b>	1000	<b>IC-P-M</b>
Phosphorus	KH <sub>2</sub> PO <sub>4</sub>	100	<b>IC-KP</b>	1000	<b>IC-KP-M</b>
Potassium	KCl	100	<b>IC-K</b>	1000	<b>IC-K-M</b>
‡ Propionate	Na Propionate	100	<b>IC-PRO</b>	1000	<b>IC-PRO-M</b>
Sodium	NaCl	100	<b>IC-NA</b>	1000	<b>IC-NA-M</b>
Sulfate	Na <sub>2</sub> SO <sub>4</sub>	100	<b>IC-SS</b>	1000	<b>IC-SS-M</b>
Sulfate	Na <sub>2</sub> SO <sub>4</sub>	10,000	<b>IC-SS-10M</b>		
Sulfur	Na <sub>2</sub> SO <sub>4</sub>	100	<b>IC-SR</b>	1000	<b>IC-SR-M</b>

† Exp Date: 6 Months    ‡ Exp Date: 12 Months    f Matrix is 0.5% KOH

These standards are sold in our standard 100, 250, and 500 mL sizes.

# Ion Chromatography Standards

Find this online @ [highpuritystandards.com/ics](http://highpuritystandards.com/ics)

## Multielement IC Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>IC-1</b>	Nitrate	100 µg/mL	Nitrite*	100 µg/mL	Phosphate	100 µg/mL	Fluoride	100 µg/mL	H <sub>2</sub> O
	Bromide	100	Chloride	100	Sulfate	100			*Solution B
<b>IC-2</b>	Nitrate	1000	Nitrite*	1000	Phosphate	1000	Fluoride	1000	H <sub>2</sub> O
	Bromide	1000	Chloride	1000	Sulfate	1000			*Solution B
<b>IC-4</b>	Ammonium	100	Calcium	100	Magnesium	100	Potassium	100	H <sub>2</sub> O
	Sodium	100							*Solution B
<b>IC-AN5-1</b>	Chloride	30	Nitrate	100	Sulfate	150	Phosphate	150	H <sub>2</sub> O
	Fluoride	20							
<b>IC-AN6-1</b>	Bromide	400	Nitrate	400	Sulfate	400	Phosphate	600	H <sub>2</sub> O
	Chloride	200	Fluoride	100					

## Bio IC Calibration Standards

This kit is a set of 6 solutions in water. BIO-IC-CAL is designed to establish the calibration curve of varying concentrations plus a quality control check to meet ASTM D7328. It is available in 100 or 250mL sizes.

Catalog No.	Solution	Components	Concentration	Solution	Components	Concentration
<b>BIO-IC-CAL</b>	A	Cl, SO <sub>4</sub>	0.5 µg/mL	D	Cl, SO <sub>4</sub>	5 µg/mL
	B	Cl, SO <sub>4</sub>	1	E	Cl, SO <sub>4</sub>	10
	C	Cl, SO <sub>4</sub>	3	Check Solution	Cl, SO <sub>4</sub>	3

Need technical assistance? Call us for help with all your laboratory questions.



# Water Standards

Find this online @ [highpuritystandards.com/ws](http://highpuritystandards.com/ws)

## Trace Metals in Drinking Water Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix
<b>CRM-TMDW</b>	Al	120µg/L	Cr	20µg/L	Mo	100µg/L	Te	3 µg/L	2% HNO <sub>3</sub> + Tr HF
	Sb	10	Co	25	Ni	60	Tl	10	
	As	80	Cu	20	K	2500	V	30	
	Ba	50	Fe	100	Rb	10	U	10	
	Be	20	Pb	40	Se	10	Zn	70	
	Bi	10	Li	20	Ag	2			
	Cd	10	Mg	9000	Na	6000			
	Ca	35,000	Mn	40	Sr	250			
	<b>CRM-TMDW-A</b>	Al	125	Ca	31,000	Mg	8000	Na	
Sb		55	Cr	20	Mn	40	Sr	300	
As		55	Co	25	Mo	110	Tl	10	
Ba		500	Cu	20	Ni	60	V	35	
Be		15	Fe	90	K	2500	Zn	75	
B		150	Pb	20	Se	11			
Cd		10	Li	15	Ag	2			
<b>CRM-TMDW-B</b>	Al	125	Ca	31,000	Mg	8000	Na	22,000	2% HNO <sub>3</sub> + Tr HF
	Sb	55	Cr	20	Mn	40	Sr	300	
	As	10	Co	25	Mo	110	Tl	10	
	Ba	500	Cu	20	Ni	60	V	35	
	Be	15	Fe	90	K	2500	Zn	75	
	B	150	Pb	20	Se	11			
	Cd	10	Li	15	Ag	2			
<b>Primary Drinking Water Metals</b>									
<b>DWPS</b>	As	100	Cd	50	Pb	100	Se	50	2% HNO <sub>3</sub>
	Ba	50	Cr	100	Hg*	20	Ag	10	*5% HNO <sub>3</sub>
<b>Secondary Drinking Water Metals</b>									
<b>DWSS</b>	Cu	50	Fe	100	Mn	50	Zn	50	2% HNO <sub>3</sub>

## Simulated Rainwater

The following Simulated Rainwater standards are available in 250 mL, packaged as 5 x 50 mL bottles. The concentrations shown are the targeted values for each level.



Catalog No.	SR-1	SR-2
pH, 25°C	4.3	3.6
Specific Conductance (µS/cm, 25°C)	26	130
<b>Components</b>	<b>mg/L</b>	<b>mg/L</b>
Fluoride	0.05	0.10
Chloride	0.25	1
Nitrate	0.50	7
Sulfate	2.5	11
Sodium	0.20	0.40
Potassium	0.05	0.10
Ammonium	0.10	1
Calcium	0.01	0.05
Magnesium	0.02	0.05

These standards are sold in our standard 100, 250, and 500 mL sizes.

## Certified Wastewater - Trace Metals Solutions

HPS is offering a series of certified reference solutions which simulate the concentrations found of a variety of materials. These solutions, which are directly traceable to NIST, may be used in laboratory performance evaluation, quality control, and method development. All of the following solutions are ideally suited for AAS, ICP, and ICP-MS.

Listed below are the concentrations that will be found when each 10 mL sample is diluted to **one liter**.

Catalog No.	CWW-TM-A	CWW-TM-B	CWW-TM-C	CWW-TM-D	CWW-TM-E	CWW-TM-F	CWW-TM-G	CWW-TM-H
<b>Matrix</b>	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL	10% HNO <sub>3</sub> + Tr HF µg/mL
<b>Elements</b>								
Aluminum	0.050	0.200	0.500	1	0.025	0.025	1	0.100
Antimony	0.010	0.050	0.150	0.250	0.005	0.250	0.005	0.200
Arsenic	0.010	0.050	0.150	0.250	0.005	0.005	0.250	0.100
Barium	0.050	0.200	0.500	1	0.025	1	0.025	0.100
Beryllium	0.010	0.050	0.150	0.250	0.005	0.005	0.250	0.020
Boron	0.050	0.200	0.500	1	0.025	1	0.025	0.250
Cadmium	0.010	0.050	0.150	0.250	0.025	0.005	0.250	0.100
Chromium	0.050	0.200	0.500	1	0.025	1	0.025	0.500
Cobalt	0.050	0.200	0.500	1	0.025	0.025	1	0.500
Copper	0.050	0.200	0.500	1	0.025	1	0.025	0.500
Iron	0.050	0.200	0.500	1	0.025	0.025	1	0.250
Lead	0.050	0.200	0.500	1	0.025	1	0.025	0.500
Manganese	0.050	0.200	0.500	1	0.025	0.025	1	0.100
Mercury*	0.001	0.005	0.010	0.02	0.001	0.020	0.005	0.0010
Molybdenum	0.050	0.200	0.500	1	0.025	0.025	1	0.100
Nickel	0.050	0.200	0.500	1	0.025	1	0.250	0.500
Selenium	0.010	0.050	0.150	0.250	0.005	0.005	0.250	0.050
Silver	0.010	0.050	0.150	0.250	0.005	0.250	0.005	0.020
Strontium	0.050	0.200	0.500	1	0.025	0.025	1	0.100
Thallium	0.010	0.050	0.150	0.250	0.005	0.025	0.005	0.250
Vanadium	0.050	0.200	0.500	1	0.025	0.025	1	0.500
Zinc	0.050	0.200	0.500	1	0.025	1	0.025	0.500
Volume	10 mL	10 mL	10 mL	10 mL	10 mL	10 mL	10 mL	10 mL

**\*The concentration of Mercury cannot be guaranteed for any extended period of time due to the nature of the element.**

Any of our wastewater standards can be modified to meet your needs. Call (843) 767-7900 to discuss your needs with our staff.

# Natural & Simulated Matrix Reference Materials

Find this online @ [highpuritystandards.com/crm](http://highpuritystandards.com/crm)

High-Purity Standards offers two lines of standards (food and non-food) designed to address the need for standards in natural matrices. These solid standards are from materials that have been collected, dried, ground, blended and tested. At least two different analytical techniques were used to certify; these standards for major and trace elements. Data for additional digestion techniques, such as EPA-3050, are included for most. Details on the elements certified in these products can be found on the website.

## Solid CRM List

Catalog No.	Matrix	Certified For	Weight/grams
<b>CRM-DF-A</b>	Dog Food	Metals, Carbon, Sulfur, Nitrogen	50
<b>CRM-CM-A</b>	Corn Meal	Metals, Carbon, Sulfur, Nitrogen	50
<b>CRM-COAL-A1</b>	Coal	Metals, Sulfur	50
<b>CRM-LO-A</b>	Loam	Metals, Carbon, Sulfur	50
<b>CRM-LO-B</b>	Loam	Metals, Carbon, Sulfur	50
<b>CRM-LO-C</b>	Loam	Metals	40
<b>CRM-LO-D</b>	Loam	Metals	40
<b>CRM-LO-E</b>	Loam	Metals	50
<b>CRM-LO-X</b>	Highly Contaminated Loam	Metals, Carbon, Sulfur	40
<b>CRM-MP-A</b>	Milk Powder	Metals, Carbon, Sulfur, Nitrogen	40
<b>CRM-MS-S</b>	Marine Sediment	Metals, Carbon, Sulfur	50
<b>CRM-PC-A</b>	Paint Chips	0.1% Lead	40
<b>CRM-PC-B</b>	Paint Chips	0.5% Lead	40
<b>CRM-PC-C</b>	Paint Chips	4% Lead	40
<b>CRM-PN-A</b>	Pine Needles	Metals, Carbon, Sulfur, Nitrogen	30
<b>CRM-S-D</b>	Sludge - Domestic	Metals, Carbon, Sulfur	50
<b>CRM-S-I</b>	Sludge - Industrial	Metals, Carbon, Sulfur	50
<b>CRM-SA-A</b>	Sand	Metals, Carbon, Sulfur	50
<b>CRM-SA-B</b>	Sand	Metals, Carbon, Sulfur	50
<b>CRM-SA-C</b>	Sand	Metals, Sulfur	50
<b>CRM-SBM-A</b>	Soybean Meal	Metals, Carbon, Sulfur, Nitrogen	50
<b>CRM-WF-S</b>	Wheat Flour	Carbon, Sulfur, Nitrogen	40

The simulated matrix reference materials are standards that typically replicate 1-2 grams of natural matrix reference materials after they have undergone acid digestions and have been diluted to 100 mL. Details on the elements certified in these products can be found on the website.

## Soil and Biological Solutions

Catalog No.	Simulated Material	Matrix	Catalog No.	Simulated Material	Matrix
<b>CRM-SW</b>	Sea Water	2% HNO <sub>3</sub>	<b>CRM-SW</b>	Sea Water	2% HNO <sub>3</sub>
<b>CRM-RS-A</b>	River Sediment	4% HNO <sub>3</sub>	<b>CRM-RS-A</b>	River Sediment	4% HNO <sub>3</sub>
<b>CRM-RS-B</b>	River Sediment	4% HNO <sub>3</sub>	<b>CRM-RS-B</b>	River Sediment	4% HNO <sub>3</sub>
<b>CRM-ES</b>	Estuarian Sediment	4% HNO <sub>3</sub>	<b>CRM-ES</b>	Estuarian Sediment	4% HNO <sub>3</sub>
<b>CRM-SOIL-A</b>	Soil Solution	4% HNO <sub>3</sub>	<b>CRM-SOIL-A</b>	Soil Solution	4% HNO <sub>3</sub>
<b>CRM-SOIL-B</b>	Soil Solution	4% HNO <sub>3</sub>	<b>CRM-SOIL-B</b>	Soil Solution	4% HNO <sub>3</sub>
<b>CRM-OL</b>	Orchard Leaves	4% HNO <sub>3</sub>			



# HIGH-PURITY STANDARDS

P.O. Box 41727  
Charleston, SC 29423

Toll Free (866) 767-4771  
Phone (843) 767-7900  
Fax (843) 767-7906

[www.highpuritystandards.com](http://www.highpuritystandards.com)