

# ICP Multielement Standards

The multielement standards listed on the next several pages are prepared from high-purity metals or salts in subboiling distilled acids and packaged in 100, 250, and 500 mL HDPE or LDPE laboratory grade bottles. 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	Volume
<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	100 mL
	Sb	10	Mo	10	Ti	10		250 mL
	As	10	Se	10	Tl	10		500 mL
	Be	1	Ag	1	Zn	10		
	Fe	10						
<b>ICP-WS-2</b>	Ba	10 $\mu\text{g/mL}$	Cr	10 $\mu\text{g/mL}$	Ni	10 $\mu\text{g/mL}$	2% $\text{HNO}_3$	100 mL
	Bi	10	Co	10	K	50		250 mL
	B	10	Cu	10	Na	50		500 mL
	Cd	10	Mg	50	Sr	10		
	Ca	50	Mn	10	V	10		
<b>ICP-WS-3</b>	Au	10 $\mu\text{g/mL}$	Pd	10 $\mu\text{g/mL}$	Ru	10 $\mu\text{g/mL}$	5% HCl	100 mL
	Ir	10	Pt	50	Te	50		250 mL
	Os	10	Rh	10				500 mL
<b>ICP-WS-4</b>	Ce	10 $\mu\text{g/mL}$	La	10 $\mu\text{g/mL}$	Tb	10 $\mu\text{g/mL}$	2% $\text{HNO}_3$	100 mL
	Dy	10	Lu	10	Th	10		250 mL
	Er	10	Nd	10	Tm	10		500 mL
	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	Volume
<b>WAVECAL</b>	As	20 $\mu\text{g/mL}$	Mo	20 $\mu\text{g/mL}$	Sc	20 $\mu\text{g/mL}$	2% HCl	100 mL
	La	20	Ni	20	Na	20		250 mL
	Li	20	P	100	S	100		500 mL
	Mn	20	K	100				

# ICP Multielement Standards

## 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.	Matrix	Volume
<b>ICP-AM-1</b>	Ba	25 µg/mL	Mo	50 µg/mL			2% HNO <sub>3</sub>	100 mL
	Ca	250	K	500			+ Tr HF	250 mL
	Mg	100	Na	500				500 mL
<b>ICP-AM-3</b>	Al	100 µg/mL	Co	100 µg/mL	Hg	5 µg/mL	2% HNO <sub>3</sub>	100 mL
	As	50	Cu	100	Ni	50		250 mL
	Be	10	Fe	50	Se	50		500 mL
	Cd	100	Pb	100	V	100		
	Cr	100	Mn	100	Zn	100		
<b>ICP-AM-4</b>	Sb	100 µg/mL	Se	100 µg/mL	Sn	100 µg/mL	20% HCl	100 mL
	Ca	100	Na	100	Te	100		250 mL
	Mg	100	S	100				500 mL
<b>ICP-AM-5</b>	Al	100 µg/mL	Cr	100 µg/mL	Pb	100 µg/mL	5% HCl	100 mL
	As	100	Co	100	Mn	100		250 mL
	Ba	100	Cu	100	Ni	100		500 mL
	Be	100	Fe	100	Zn	100		
	Cd	100						
<b>ICP-AM-6</b>	Al	100 µg/mL	Co	100 µg/mL	K	100 µg/mL	4% HNO <sub>3</sub>	100 mL
	Sb	100	Cu	100	Si	100	+ Tr HF	250 mL
	Ba	100	Fe	100	Ag*	100		500 mL
	Be	100	Pb	100	Na	100		
	B	100	Li	100	Sr	100		
	Cd	100	Mg	100	Tl	100		
	Ca	100	Mn	100	V	100	*Solution B	
	Cr	100	Ni	100	Zn	100	2% HNO <sub>3</sub>	
<b>ICP-AM-11</b>	Sb	1000 µg/mL	Si	2000 µg/mL			4% HNO <sub>3</sub>	100 mL
	B	1000	Sn	1000			+ 1% HF	250 mL
	Mo	200	Ti	200				500 mL
<b>ICP-AM-12</b>	Al	100 µg/mL	Co	100 µg/mL	Se	100 µg/mL	4% HNO <sub>3</sub>	100 mL
	Sb	100	Cu	100	Tl	100	+ Tr HF	250 mL
	As	100	Pb	100	V	100		500 mL
	Be	100	Mn	100	Zn	100		
	Cd	100	Mo	100	Th*	100		
	Cr	100	Ni	100	U	100	*Solution B	
							2% HNO <sub>3</sub>	

# ICP Multielement Standards

## Initial Check Verification Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix	Volume
<b>ICV-1</b>	Al	100 µg/mL	Cu	100 µg/mL	K	200 µg/mL	4% HNO <sub>3</sub> + Tr HF	100 mL
	As	100	Fe	100	Se	200		250 mL
	Ba	50	Pb	100	Si*	100		500 mL
	Be	50	Li	100	Na*	162	*Solution B H <sub>2</sub> O	
	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	Zn	50		
	Co	50						
	<b>ICV-2</b>	Sb	100 µg/mL					15% HCl
Sn		100					250 mL	
Ti		100					500 mL	
<b>ICV-3</b>	Au	50 µg/mL					5% HCl	100 mL
	Pd	50						250 mL
	Pt	50						500 mL
<b>ICV-4</b>	Al	200 µg/mL	Co	50 µg/mL	K	5000 µg/mL	4% HNO <sub>3</sub> + Tr HF	100 mL
	Sb	60	Cu	25	Se	5		250 mL
	As	10	Fe	100	Ag	10		500 mL
	Ba	200	Pb	5	Na	5000		
	Be	5	Mg	5000	Tl	10		
	Cd	5	Mn	15	V	50		
	Ca	5000	Ni	40	Zn	20		
	Cr	10						

## Continuing Check Verification Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix	Volume
<b>CCV-1</b>	Al	200 µg/mL	Cu	200 µg/mL	K	500 µg/mL	4% HNO <sub>3</sub> + Tr HF	100 mL
	As	200	Fe	200	Se	200		250 mL
	Ba	100	Pb	200	Si*	500		500 mL
	Be	100	Li	200	Na*	810	*Solution B H <sub>2</sub> O	
	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	Zn	100		
	Co	100						
	<b>CCV-2</b>	Sb	200 µg/mL					15% HCl
Sn		200					250 mL	
Ti		200					500 mL	
<b>CCV-3</b>	Au	100 µg/mL					5% HCl	100 mL
	Pd	100						250 mL
	Pt	100						500 mL

# ICP Multielement Standards

## EPA Method 200.7 and 200.8 Calibration Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix	Volume	
<b>ICP-200.7-1</b>	Al	1000 µg/mL	Mg	1000 µg/mL	Ag*	500 µg/mL	2% HNO <sub>3</sub>	100 mL	
	Ca	1000	Ni	500	Na	1000		250 mL	
	Cr	500	K	1000	Zn	500	*Solution B 2% HNO <sub>3</sub>	500 mL	
<b>ICP-200.7-2</b>	Ba	100 µg/mL	Cu	100 µg/mL	Sr	1000 µg/mL	2% HNO <sub>3</sub>	100 mL	
	Be	100	Fe	1000	V	100		250 mL	
	Co	200	Mn	100				500 mL	
<b>ICP-200.7-4</b>	Sb	1000 µg/mL					4% HNO <sub>3</sub>	100 mL	
	Mo	1000					+ Tr HF	250 mL	
	Ti	1000						500 mL	
<b>ICP-200.7-5</b>	Al	25 µg/mL	Cu	25 µg/mL	Se	25 µg/mL	2% HNO <sub>3</sub>	100 mL	
	Sb	25	Fe	25	Si	25	+ Tr HF	250 mL	
	As	25	Pb	25	Ag	2.5		500 mL	
	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 µg/mL	Cu	20 µg/mL	K	100 µg/mL	2% HNO <sub>3</sub>	100 mL	
	Sb	20	Fe	20	Se	20	+ Tr HF	250 mL	
	As	20	Pb	20	Si	100		500 mL	
	Ba	20	Li	20	Ag	5			
	Be	20	Mg	20	Na	20			
	B	20	Mn	20	Sr	20	*Solution B 2% HNO <sub>3</sub>		
	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 µg/mL	Co	50 µg/mL	Ni	50 µg/mL	2% HNO <sub>3</sub>	100 mL
		Ba	50	Cr	50	Sn	50	+ Tr HF	250 mL
Be		50	Cu	50	SiO <sub>2</sub>	50		500 mL	
Cd		50	Fe	300	Ti	50			
Ca		50	Mn	50	Tl	50			
Ce		50	Mo	50	V	50			
<b>ICP-200.8-1</b>	Al	10 µg/mL	Co	10 µg/mL	Ag	10 µg/mL	2% HNO <sub>3</sub>		
	Sb	10 µg/mL	Cu	10 µg/mL	Tl	10 µg/mL	+ Tr HF		
	As	10 µg/mL	Pb	10 µg/mL	Th	10 µg/mL			
	Ba	10 µg/mL	Mn	10 µg/mL	U	10 µg/mL			
	Be	10 µg/mL	Mo	10 µg/mL	V	10 µg/mL			
	Cd	10 µg/mL	Ni	10 µg/mL	Zn	10 µg/mL			
	Cr	10 µg/mL	Se	10 µg/mL					

# ICP Multielement Standards

## Interference Check Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix	Volume
<b>INFCS-1</b>	As	1000 µg/mL	Cu	300 µg/mL	Se	500 µg/mL	4% HNO <sub>3</sub>	100 mL
	Ba	300	Pb	1000	Ag*	300		250 mL
	Be	100	Mn	200	Tl	1000		500 mL
	Cd	300	Hg	50	V	300	*Solution B	
	Cr	300	Ni	300	Zn	300		
	Co	300	K	20,000				
<b>INFCS-4</b>	Al	5000 µg/mL	Fe	5000 µg/mL			5% HNO <sub>3</sub>	100 mL
	Ca	5000	Mg	5000				250 mL
								500 mL
<b>INFCS-5</b>	K	5000 µg/mL					2% HCl	100 mL
	Na	5000						250 mL
								500 mL
<b>INFCS-6</b>	Al	1200 µg/mL	Mg	3000 µg/mL			4% HNO <sub>3</sub>	100 mL
	Ca	6000	Na	1000				250 mL
	Fe	5000						500 mL

## 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.	Matrix	Volume
<b>ICP-SS</b>	Al	100 µg/mL	Co	20 µg/mL	Si	500 µg/mL	2% HNO <sub>3</sub> + Tr HF	100 mL
	Sb	50	Cu	20	Ag	1.5		250 mL
	As	25	Fe	100	Na	2000		500 mL
	Ba	20	Pb	25	Sr	100		
	Be	20	Mg	500	Tl	10		
	B	20	Mn	20	Sn	20		
	Cd	20	Ni	20	V	20		
	Ca	2000	K	150	Zn	100		
	Cr	20	Se	50				

# ICP Multielement Standards

## Quality Control Standards

Catalog No.	Element	Conc.	Element	Conc.	Element	Conc.	Matrix	Volume		
<b>QCS-1</b>	Al	100 µg/mL	Co	100 µg/mL	K	100 µg/mL	4% HNO <sub>3</sub> + Tr HF	100 mL		
	As	100	Fe	100	Se	100		250 mL		
	Ba	100	Li	100	Si	100		500 mL		
	Be	100	Mg	100	S*	100	*Solution B H <sub>2</sub> O			
	B	100	Mn	100	U	100				
	Cd	100	Mo	100	V	100				
	Ca	100	Ni	100	Y	500				
	Cr	100	P	100	Zn	100				
	<b>QCS-2</b>	Sb	100 µg/mL	Sn	100 µg/mL				5% HCl	100 mL
		Na	100	Y	500					250 mL
							500 mL			
<b>QCS-3</b>	Cu	100 µg/mL	Ag	100 µg/mL	Y	500 µg/mL	2% HNO <sub>3</sub>	100 mL		
	Pb	100	Tl	100				250 mL		
								500 mL		
<b>QCS-7</b>	Al	100 µg/mL	K	1000 µg/mL	Na	100 µg/mL	2% HNO <sub>3</sub>	100 mL		
	Ba	100	Si	50				250 mL		
	B	100	Ag	100				500 mL		
<b>QCS-7-M</b>	Al	100 µg/mL	K	1000 µg/mL	Na	100 µg/mL	2% HNO <sub>3</sub>	100mL		
	Ba	100	Si	100				250 mL		
	B	100	Ag	50				500 mL		
<b>QCS-19</b>	Sb	100 µg/mL	Cu	100 µg/mL	Ni	100 µg/mL	4% HNO <sub>3</sub> + Tr HF	100 mL		
	As	100	Fe	100	Se			100	250 mL	
	Be	100	Pb	100	Tl			100	500 mL	
	Cd	100	Mg	100	Ti			100		
	Ca	100	Mn	100	V			100		
	Cr	100	Mo	100	Zn			100		
	Co	100								
	<b>QCS-21</b>	Sb	100 µg/mL	Cu	100 µg/mL			Ni	100 µg/mL	4% HNO <sub>3</sub> + Tr HF
As		100	Fe	100	Se	100	250 mL			
Be		100	Pb	100	Sr	100	500 mL			
Cd		100	Li	100	Tl	100				
Ca		100	Mg	100	Ti	100				
Cr		100	Mn	100	V	100				
Co		100	Mo	100	Zn	100				
<b>QCS-26</b>		Al	100 µg/mL	Cr	100 µg/mL	Pb	100 µg/mL	4% HNO <sub>3</sub> + Tr HF		
	Sb	100	Cu	100	Ag	100			250 mL	
	As	100	Fe	100	Se	100			500 mL	
	B	100	K	1000	Si	50				
	Ba	100	Mg	100	Ti	100				
	Be	100	Mn	100	Tl	100				
	Ca	100	Mo	100	V	100				
	Cd	100	Na	100	Zn	100				
	Co	100	Ni	100						