

Elemental Analysis Standards

Product Specification

These ICP/DCP and AA standards are prepared for US Environmental Protection Agency (EPA) analyses from carefully purified and assayed raw materials. The standards feature:

- Exact concentration of 1000 ±10µg/mL for named element
- Raw material purity of 99.999% or higher
- 18 megaohm water used throughout preparation procedure
- ppb grade acids used, for maximum purity
- Supplied in acid-washed LDPE bottles*
- NIST traceability and documentation of procedures
- Lot analysis on file for starting materials
- Identity check and chemical analysis for each product lot
- Trace impurities (maximum 1µg/mL) listed on lot data sheet
- Frequent stock rotation
- Ready to ship on the day you order

The concentrates used to prepare the mixed standards are traceable to National Institute of Standard and Technology (NIST) standards where applicable, and each standard solution is double-checked for concentrations and impurities. A lot analysis is provided with each mixed element standard and blank solution.

Ordering Information:

Instrument Calibration Standards

Mixed Elements Set 1

5000µg/mL each component in 5% HNO₃.

Calcium	Potassium	
Magnesium	Sodium	
	100mL	41382-8

Mixed Elements Set 2

Analytes at stated concentrations per mL in 5% HNO₃.

Chromium (100µg)	Silver (100µg)	
Manganese (150µg)	Zinc (200µg)	
Nickel (400µg)		
	100mL	41383-6

Mixed Elements Set 3

Analytes at stated concentrations per mL in 5% HNO₃.

Aluminum (2000µg)	Copper (250µg)	
Barium (2000µg)	Iron (1000µg)	
Beryllium (50µg)	Vanadium (500µg)	
Cobalt (500µg)		
	100mL	41384-4

Mixed Elements Set 4

Analytes at stated concentrations per mL in 5% HNO₃.

Arsenic (100µg)	Selenium (50µg)	
Cadmium (50µg)	Thallium (100µg)	
Lead (50µg)		
	100mL	41385-2

Antimony, Standard 5

600µg/mL in 2% HNO ₃ .		
	100mL	41386-0

Mercury, Standard 6

100µg/mL in 10% HNO ₃ .		
	100mL	41387-9

Interference Check Solutions

Mixed Interferent Elements, Set 1

Analytes at stated concentrations per mL in 5% HNO₃.

Aluminum (5000µg)	Iron (2000µg)	
Calcium (5000µg)	Magnesium (5000µg)	
	500mL	41388-7

Mixed Interferent Elements, Set 2

1000µg/mL each component in 5% HNO₃.

Chromium	Nickel	
Copper	Titanium	
Manganese	Vanadium	
	500mL	41389-5

Mixed Analyte Elements, Set 3

Analytes at stated concentrations per mL in 5% HNO₃.

Barium (50µg)	Lead (100µg)	
Beryllium (50µg)	Manganese (50µg)	
Cadmium (100µg)	Nickel (100µg)	
Cobalt (50µg)	Silver (100µg)	
Chromium (50µg)	Vanadium (50µg)	
Copper (50µg)	Zinc (100µg)	
	100mL	41390-9

Mixed Analyte Elements, Set 4

Analytes at stated concentrations per mL in 5% HNO₃.

Aluminum (100µg)	Magnesium (10µg)	
Antimony (100µg)	Molybdenum (100µg)	
Arsenic (100µg)	Selenium (100µg)	
Boron (100µg)	Silicon (10µg)	
Calcium (10µg)	Sodium (100µg)	
Iron (10µg)	Thallium (100µg)	
	100mL	41391-7

* Using a modification of a procedure developed at NBS (now NIST) (J.R. Moody & R.M. Lindstrom, Anal. Chem., 49:2264 (1977)).

Additional Solutions for EPA Methods

Calibration Verification Check Standard

Analytes at stated concentrations per mL in 5% HNO₃.

Aluminum (200µg)	Lead (5µg)	
Antimony (60µg)	Magnesium (5000µg)	
Arsenic (10µg)	Manganese (15µg)	
Barium (200µg)	Nickel (40µg)	
Beryllium (5µg)	Potassium (5000µg)	
Cadmium (5µg)	Selenium (5µg)	
Calcium (5000µg)	Silver (10µg)	
Chromium (10µg)	Sodium (5000µg)	
Cobalt (50µg)	Thallium (10µg)	
Copper (25µg)	Vanadium (50µg)	
Iron (100µg)	Zinc (20µg)	
	500mL	41392-5

Contract Required Detection Limits Standard

Analytes at stated concentrations per mL in 5% HNO₃.

Arsenic (20µg)	Manganese (30µg)	
Antimony (120µg)	Nickel (80µg)	
Beryllium (10µg)	Selenium (10mcg)	
Cadmium (10µg)	Silver (20µg)	
Chromium (20µg)	Thallium (20µg)	
Cobalt (100µg)	Vanadium (100µg)	
Copper (50µg)	Zinc (40µg)	
Lead (6µg)		
	100mL	41401-8

Analyte Spike Standard Solution

Analytes at stated concentrations per mL in 5% HNO₃.

Aluminum (200µg)	Iron (100µg)	
Antimony (50µg)	Lead (50µg)	
Arsenic (200µg)	Manganese (50µg)	
Barium (200µg)	Nickel (50µg)	
Beryllium (5µg)	Selenium (200µg)	
Cadmium (5µg)	Silver (5µg)	
Chromium (20µg)	Thallium (200µg)	
Cobalt (50µg)	Vanadium (50µg)	
Copper (25µg)	Zinc (50µg)	
	100mL	41399-2

Reagent Blank Solutions

(ASTM Type 1 Water)

5% Hydrochloric Acid (HCl)

500mL **41397-6**

5% Nitric Acid (HNO₃)

500mL **41398-4**

Water

500mL **41396-8**

Contact our Technical Service Department
(phone 800-359-3041 or 814-359-3041, FAX 814-359-5468)
for expert answers to your questions.

EPA Calibration Check Standards for AA and ICP, 1000µg/mL

Element	Solvent (wt%)	Qty.	Cat. No.
Aluminum	1% HCl	100mL	40,419-5A
		500mL	40,419-5B
Antimony	8% HCl	100mL	40,418-7A
		500mL	40,418-7B
Arsenic	1% HNO ₃	100mL	40,417-9A
		500mL	40,417-9B
Barium	1% HNO ₃	100mL	40,416-0A
		500mL	40,416-0B
Beryllium	4% HNO ₃	100mL	40,415-2A
		500mL	40,415-2B
Boron	H ₂ O (trace H ₂ O ₂)	100mL	40,414-4A
		500mL	40,414-4B
Cadmium	1% HNO ₃	100mL	40,413-6A
		500mL	40,413-6B
Calcium	1% HNO ₃	100mL	40,412-8A
		500mL	40,412-8B
Chromium	1% HCl	100mL	40,410-1A
		500mL	40,410-1B
Cobalt	1% HNO ₃	100mL	40,409-8A
		500mL	40,409-8B
Copper	2% HNO ₃	100mL	40,407-1A
		500mL	40,407-1B
Iron	1% HNO ₃	100mL	40,406-3A
		500mL	40,406-3B
Lanthanum	1% HNO ₃	100mL	40,405-5A
		500mL	40,405-5B
Lead	1% HNO ₃	100mL	40,404-7A
		500mL	40,404-7B
Magnesium	1% HNO ₃	100mL	40,403-9A
		500mL	40,403-9B
Manganese	1% HNO ₃	100mL	40,402-0A
		500mL	40,402-0B
Mercury	9% HNO ₃	100mL	40,401-2A
		500mL	40,401-2B
Molybdenum	H ₂ O	100mL	40,400-4A
		500mL	40,400-4B
Nickel	1% HNO ₃	100mL	40,399-7A
		500mL	40,399-7B
Potassium	1% HNO ₃	100mL	40,398-9A
		500mL	40,398-9B
Selenium	2% HNO ₃	100mL	40,397-0A
		500mL	40,397-0B
Silicon	2% NaOH	100mL	40,396-2A
		500mL	40,396-2B
Silver	2% HNO ₃	100mL	40,395-4A
		500mL	40,395-4B
Sodium	1% HNO ₃	100mL	40,394-6A
		500mL	40,394-6B
Strontium	2% HNO ₃	100mL	40,393-8A
		500mL	40,393-8B
Thallium	1% HNO ₃	100mL	40,391-1A
		500mL	40,391-1B
Tin	8% HCl	100mL	40,390-3A
		500mL	40,390-3B
Titanium	H ₂ O (trace HF)	100mL	40,388-1A
		500mL	40,388-1B
Vanadium	1% HNO ₃	100mL	40,387-1A
		500mL	40,387-1B
Zinc	1% HNO ₃	100mL	40,386-1A
		500mL	40,386-1B

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