

Certified Reference Materials
for photometric applications

**NO DILUTION.
NO DOUBTS.
NO DELAYS.**

**PRECISE
ANALYTICAL
QUALITY
CONTROL**

**NO DILUTION
NEEDED**

**DIRECTLY
TRACEABLE
TO NIST**

Exact, batch-specific concentration,
and expanded measurement uncertainty



Also see our

**KROMega
CRMS** (page 107)

Experience absolute precision in photometric quality control with our ready-to-use diluted certified reference materials (CRMs). Thanks to their exact concentrations, expanded measurement uncertainty, and direct traceability to NIST primary reference materials, our CRMs ensure that your results are correct and comparable worldwide.

Complete range with all parameters for analytical quality control of wastewater, drinking water and process water

Detailed Certificate of Analysis for each CRM simplifies accreditation

Compatible with Spectroquant® test kits or those from other suppliers

Ready-to-use, diluted CRMs save time and prevent dilution errors

Long shelf life of 24 months

Directly traceable to NIST primary measurement standards

Ideal for validating international norm methods: ISO, EN, EPHA, and EPA

Even better together

The perfect combination for water analysis: use our certified standard solutions with Spectroquant® Prove spectrophotometers.

Learn more about: Prove (page 36) and CRMs (page 104)



Definitions

Traceability

"Property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty." ¹⁾

Certified reference material (CRM)

"Reference material (RM) characterized by a metrologically valid procedure for one or more specified properties, accompanied by an RM certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability." ²⁾

Primary measurement standard

"Measurement standard that is designated or widely acknowledged as having the highest metrological qualities and whose property value is accepted without reference to other standards of the same property or quantity, within a specified context." ²⁾

Secondary measurement standard

"Measurement standard whose property value is assigned by comparison with a primary measurement standard of the same property or quantity." ²⁾

¹⁾ ISO Guide 99:2007; International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (VIM)

²⁾ ISO/Guide 30:2015; Reference Materials – Selected Terms and Definitions

Certified Reference Materials for photometric applications

Standard Solutions (100 mL in H₂O), traceable to SRM from NIST

Product	Concentration	Expanded Measurement Uncertainty	Ord. No.
A Aluminium Standard Solution	0.0500 mg/L Al	± 0.0020 mg/L Al	1.32226.0100
Aluminium Standard Solution	0.200 mg/L Al	± 0.006 mg/L Al	1.32225.0100
Ammonium Standard Solution	0.250 mg/L NH ₄	± 0.011 mg/L NH ₄	1.32227.0100
Ammonium Standard Solution	0.400 mg/L NH ₄ -N	± 0.012 mg/L NH ₄ -N	1.25022.0100
Ammonium Standard Solution	1.00 mg/L NH ₄ -N	± 0.04 mg/L NH ₄ -N	1.25023.0100
Ammonium Standard Solution	2.00 mg/L NH ₄ -N	± 0.07 mg/L NH ₄ -N	1.25024.0100
Ammonium Standard Solution	6.00 mg/L NH ₄ -N	± 0.13 mg/L NH ₄ -N	1.25025.0100
Ammonium Standard Solution	12.0 mg/L NH ₄ -N	± 0.4 mg/L NH ₄ -N	1.25026.0100
Ammonium Standard Solution	50.0 mg/L NH ₄ -N	± 1.2 mg/L NH ₄ -N	1.25027.0100
Arsenic Standard Solution	1.00 mg/L As	± 0.05 mg/L As	1.33002.0250 ^{1) 2)}
B Boron Standard Solution	1.00 mg/L B	± 0.06 mg/L B	1.33005.0100
Bromate Standard Solution	0.0100 mg/L BrO ₃	± 0.0006 mg/L BrO ₃	1.33006.0100
Bromate Standard Solution	0.1000 mg/L BrO ₃	± 0.0040 mg/L BrO ₃	1.33007.0100
C Cadmium Standard Solution	0.00500 mg/L Cd	± 0.00020 mg/L Cd	1.33008.0100 ¹⁾
Cadmium Standard Solution	0.100 mg/L Cd	± 0.003 mg/L Cd	1.32228.0100
Chloride Standard Solution	0.100 mg/L Cl	± 0.006 mg/L Cl	1.33009.0100
Chloride Standard Solution	1.00 mg/L Cl	± 0.04 mg/L Cl	1.33010.0100
Chloride Standard Solution	2.50 mg/L Cl	± 0.08 mg/L Cl	1.33011.0100
Chloride Standard Solution	10.0 mg/L Cl	± 0.5 mg/L Cl	1.32229.0100
Chloride Standard Solution	50 mg/L Cl	± 3 mg/L Cl	1.32230.0100
Chloride Standard Solution	250 mg/L Cl	± 8 mg/L Cl	1.32231.0100
Chromium Standard Solution	0.050 mg/L Cr(VI)	± 0.002 mg/L Cr(VI)	1.33012.0100
Chromium Standard Solution	1.00 mg/L Cr(VI)	± 0.03 mg/L Cr(VI)	1.33013.0100
COD Standard Solution	20.0 mg/L	± 0.7 mg/L	1.25028.0100
COD Standard Solution	100 mg/L	± 3 mg/L	1.25029.0100
COD Standard Solution	200 mg/L	± 4 mg/L	1.25030.0100
COD Standard Solution	400 mg/L	± 5 mg/L	1.25031.0100
COD Standard Solution	1,000 mg/L	± 11 mg/L	1.25032.0100
COD Standard Solution	2,000 mg/L	± 32 mg/L	1.25033.0100
COD Standard Solution	8,000 mg/L	± 68 mg/L	1.25034.0100
COD Standard Solution	50,000 mg/L	± 894 mg/L	1.25035.0100
F Fluoride Standard Solution	0.200 mg/L F	± 0.012 mg/L F	1.32234.0100
Fluoride Standard Solution	0.50 mg/L F	± 0.02 mg/L F	1.32233.0100
Fluoride Standard Solution	1.00 mg/L F	± 0.03 mg/L F	1.32235.0100
Fluoride Standard Solution	1.50 mg/L F	± 0.04 mg/L F	1.32236.0100
I Iron Standard Solution	0.0500 mg/L Fe	± 0.0015 mg/L Fe	1.33014.0100 ¹⁾
Iron Standard Solution	0.1000 mg/L Fe	± 0.0030 mg/L Fe	1.33018.0100 ¹⁾
Iron Standard Solution	0.300 mg/L Fe	± 0.009 mg/L Fe	1.33019.0100 ¹⁾
Iron Standard Solution	1.00 mg/L Fe	± 0.04 mg/L Fe	1.33020.0100 ¹⁾
L Lead Standard Solution	0.0500 mg/L Pb	± 0.0040 mg/L Pb	1.33003.0100 ¹⁾
Lead Standard Solution	0.100 mg/L Pb	± 0.005 mg/L Pb	1.33004.0100 ¹⁾
M Manganese Standard Solution	0.050 mg/L Mn	± 0.004 mg/L Mn	1.32237.0100
Manganese Standard Solution	0.200 mg/L Mn	± 0.005 mg/L Mn	1.32238.0100
Manganese Standard Solution	1.00 mg/L Mn	± 0.03 mg/L Mn	1.32239.0100

Standard Solutions (100 mL in H₂O), traceable to SRM from NIST

Product	Concentration	Expanded Measurement Uncertainty	Ord. No.
N Nitrate Standard Solution	1.00 mg/L NO ₃	± 0.03 mg/L NO ₃	1.32240.0100
Nitrate Standard Solution	10.0 mg/L NO ₃	± 0.3 mg/L NO ₃	1.32241.0100
Nitrate Standard Solution	50.0 mg/L NO ₃	± 2.0 mg/L NO ₃	1.32242.0100
Nitrate Standard Solution	0.50 mg/L NO ₃ -N	± 0.05 mg/L NO ₃ -N	1.25036.0100
Nitrate Standard Solution	2.50 mg/L NO ₃ -N	± 0.06 mg/L NO ₃ -N	1.25037.0100
Nitrate Standard Solution	15.0 mg/L NO ₃ -N	± 0.4 mg/L NO ₃ -N	1.25038.0100
Nitrate Standard Solution	40.0 mg/L NO ₃ -N	± 1 mg/L NO ₃ -N	1.25039.0100
Nitrate Standard Solution	200 mg/L NO ₃ -N	± 5 mg/L NO ₃ -N	1.25040.0100
Nitrite Standard Solution	0.0100 mg/L NO ₂ ⁻	± 0.0012 mg/L NO ₂ ⁻	1.33021.0100 ³⁾
Nitrite Standard Solution	0.200 mg/L NO ₂ -N	± 0.009 mg/L NO ₂ -N	1.25041.0100
Nitrite Standard Solution	40.0 mg/L NO ₂ -N	± 1.3 mg/L NO ₂ -N	1.25042.0100
Nitrogen (total) Standard Solution	2.50 mg/L N	± 0.06 mg/L N	1.25043.0100
Nitrogen (total) Standard Solution	12.0 mg/L N	± 0.3 mg/L N	1.25044.0100
Nitrogen (total) Standard Solution	100 mg/L N	± 3 mg/L N	1.25045.0100
P Phosphorus Standard Solution	0.400 mg/L PO ₄ -P	± 0.016 mg/L PO ₄ -P	1.25046.0100
Phosphorus Standard Solution	4.00 mg/L PO ₄ -P	± 0.08 mg/L PO ₄ -P	1.25047.0100
Phosphorus Standard Solution	15.0 mg/L PO ₄ -P	± 0.4 mg/L PO ₄ -P	1.25048.0100
Phosphorus Standard Solution	75.0 mg/L PO ₄ -P	± 1.6 mg/L PO ₄ -P	1.25049.0100
S Silicate Standard Solution	0.1000 mg/L SiO ₂	± 0.0040 mg/L SiO ₂	1.32244.0100
Silicate Standard Solution	0.500 mg/L SiO ₂	± 0.025 mg/L SiO ₂	1.32243.0100
Silicate Standard Solution	1.000 mg/L SiO ₂	± 0.030 mg/L SiO ₂	1.32245.0100
Sulfate Standard Solution	40 mg/L SO ₄	± 6 mg/L SO ₄	1.25050.0100
Sulfate Standard Solution	125 mg/L SO ₄	± 6 mg/L SO ₄	1.25051.0100
Sulfate Standard Solution	400 mg/L SO ₄	± 20 mg/L SO ₄	1.25052.0100
Sulfate Standard Solution	800 mg/L SO ₄	± 27 mg/L SO ₄	1.25053.0100
Surfactants (nonionic) Standard Solution ⁴⁾	1.00 mg/L Triton® X-100	± 0.16 mg/L Triton® X-100	1.33022.0100
Surfactants (nonionic) Standard Solution ⁴⁾	5.00 mg/L Triton® X-100	± 0.30 mg/L Triton® X-100	1.33023.0100
Surfactants (nonionic) Standard Solution ⁴⁾	10.00 mg/L Triton® X-100	± 0.30 mg/L Triton® X-100	1.33024.0100
T TOC Standard Solution	5.00 mg/L TOC	± 0.10 mg/L TOC	1.32246.0100
TOC Standard Solution	10.0 mg/L TOC	± 0.2 mg/L TOC	1.32247.0100
TOC Standard Solution	25.0 mg/L TOC	± 0.5 mg/L TOC	1.32248.0100
TOC Standard Solution	50.0 mg/L TOC	± 1.0 mg/L TOC	1.32249.0100
TOC Standard Solution	100 mg/L TOC	± 2 mg/L TOC	1.32251.0100
TOC Standard Solution	200 mg/L TOC	± 4 mg/L TOC	1.32252.0100
TOC Standard Solution	500 mg/L TOC	± 10 mg/L TOC	1.32253.0100

1) 100 mL in HNO₃ 2) 250 mL bottle 3) 100 mL in NaOH 4) traceable to USP

FREE COA

Certificates of Analysis (COA) for all our standard solutions can be downloaded free of charge on:
www.merckmillipore.com/coa



Certipur® standard solutions

Parameters A-Z

Certipur® standard solutions, concentration 1,000 mg/L

Certipur® standard solutions are **traceable to standard reference materials from NIST**, and accredited according to ISO/IEC 17025 guidelines. They can be easily diluted to different concentrations to suit your needs.

Parameter	Volume	Ord. No.	Parameter	Volume	Ord. No.
A Aluminium	100 mL	1.19770.0100	N Nickel*	1,000 mL	1.09989.0001
Ammonium	500 mL	1.19812.0500	Nitrate	500 mL	1.19811.0500
Antimony	100 mL	1.70204.0100	Nitrite	500 mL	1.19899.0500
Arsenic	100 mL	1.19773.0100	P Palladium	100 mL	1.14282.0100
B Boron	100 mL	1.19500.0100	Phosphate	500 mL	1.19898.0500
C Cadmium	100 mL	1.19777.0100	Platinum	100 mL	1.70219.0100
Calcium	100 mL	1.19778.0100	Potassium	100 mL	1.70230.0100
Chloride	500 mL	1.19897.0500	S Silicon	100 mL	1.70236.0100
Chromate	500 mL	1.19780.0500	Silver	100 mL	1.19797.0100
Chromium	100 mL	1.19779.0100	Sulfate	500 mL	1.19813.0500
Cobalt	100 mL	1.19785.0100	T Tin	100 mL	1.70242.0100
Copper	100 mL	1.19786.0100	TOC	100 mL	1.09017.0100
Cyanide	500 mL	1.19533.0500	V Vanadium	100 mL	1.70245.0100
F Fluoride	500 mL	1.19814.0500	Z Zinc	100 mL	1.19806.0100
G Gold	100 mL	1.70216.0100			
I Iron	100 mL	1.19781.0100			
L Lead	100 mL	1.19776.0100			
M Magnesium	100 mL	1.19788.0100			
Manganese	100 mL	1.19789.0100			
Mercury	100 mL	1.70226.0100			
Molybdenum	100 mL	1.70227.0100			

* *Titrisol*®



Proficiency testing (PT) process

- 1. Registration & order** – Prior to your first order, you must obtain a lab code by registering on the PT portal.
- 2. Delivery** – Participating labs receive blind samples according to schedule.
- 3. Open study** – Each lab analyzes the blind samples.
- 4. Reporting** – Labs report results on the PT portal before the study closes.
- 5. Data processing** – Data is processed to issue individual evaluation reports.
- 6. Evaluation report** – Reports are sent via the PT portal. If requested, a copy is sent to your accreditation body.

Proficiency testing products

Proficiency testing products accredited by ACLASS to ISO/IEC 17043:2010, Certificate No. AP-1469 and recognized by accreditation bodies worldwide

Application fields	Metals and Inorganics	Organics	Gases	Physical Properties
Drinking Water	■	■		■
Wastewater	■	■		■
Contaminated Land	■	■		
Air Quality and Emissions	■	■	■	
Microbiology		■		

Certified Reference Materials for instrument qualification

Kromega CRMs for UV/Vis spectrophotometers

Ready-to-use Kromega certified reference materials are designed to facilitate qualification of UV/Vis spectrophotometers for compliance with GLP regulations.

- Meet European Pharmacopoeia requirements for the calibration of UV/Vis spectrophotometers
- Reliable, traceable instrument qualification with audit trail supported by independent verification according to ISO Guide 34
- Easier, faster and more cost-effective than custom solutions
- Developed for use in any laboratory working according to ISO 17025
- Shipped in flame-sealed ampoules, and protected in custom-made boxes to increase shelf life and prevent contamination

Learn more about Kromega CRMs:

www.sigmaaldrich.com/jaytee



CRMs for photometers

Product	Description	Content	Cat. No.
UV Photometric Accuracy Standards	Used to qualify photometric accuracy of UV spectrophotometers to the limits defined in the EP	3 ampoules (1 blank, 2 standards). The standards consist of a solution of $K_2Cr_2O_7$ in Perchloric Acid	Z804452
UV Resolution Standards	Used to qualify the UV resolution of UV spectrophotometers to the limits defined in the EP	2 ampoules (1 blank, 1 standard). The standard consists of a solution of toluene in n-hexane.	Z804568
UV Stray Light Standards	Used to qualify the stray light of UV spectrophotometers to the limits defined in the EP	2 ampoules (1 blank, 1 standard). The standard consists of a solution of NaCl in water.	Z804665
UV Spec Qualification Kit	To be used in any laboratory regardless of the regulator and are as relevant to a pharmaceutical company as to a contract lab working to ISO 17025.	Contains qualification standards for UV Photometric Accuracy Resolution Stray Light	Z804789