

TraceCERT[®]

CRM Solutions for ICP, AAS and IC



*Certified Standard Solutions
produced under ISO/IEC
17025 and ISO Guide 34
2nd Edition*

TraceCERT® Traceable Certified Reference Materials

TraceCERT CRMs are high accuracy standards for instrument calibration and process validation.

Following lengthy cooperation with different metrological institutes, Sigma-Aldrich® has built a laboratory for Certified Reference Material (CRM) production and certification in Buchs, Switzerland. Since 2007 the lab holds the highest achievable quality assurance level for CRM producers: double accreditation, as a testing lab following ISO/IEC 17025 and also as a CRM producer following ISO Guide 34. This combination is also called the "Gold Standard" accreditation for CRM producers.

The scope of the double accreditation at the Buchs site currently includes gravimetry, density, ICP, titrimetry and high performance quantitative NMR (HP-qNMR). This range of techniques allows us to produce CRMs for a variety of applications. While this brochure is focusing on **CRM solutions for AAS, ICP and Ion Chromatography**, the TraceCERT product line also comprises NIST traceable organic **neat CRMs** for chromatography and quantitative NMR. Please learn more by visiting our webpage sigma-aldrich.com/tracecert

For all TraceCERT standards we guarantee:

- Highest accuracy and reliability of certified concentrations
- Traceability to internationally accepted references (i.e. NIST, BAM or SI unit kg)
- Production in accordance with ISO/IEC 17025 and ISO Guide 34
- Comprehensive certificate according to ISO Guide 31
- Competitive price

What makes TraceCERT stand above the others?



SRMS 001
ISO Guide 34

Elemental and ion standards are available from various suppliers. Why should I buy TraceCERT certified standards?

Indeed many different standards are available covering a wide range of quality, service and price. As the world's number one in supplying research chemicals and standards, Sigma-Aldrich introduced TraceCERT reference materials to underpin its **leading position** in terms of **quality** and customer convenience.



STS 490
ISO 17025

What makes TraceCERT standards higher in quality?

Highest quality depends on many different technical and personal skills. These CRMs are produced and certified in accordance to metrological guidelines: **highest accuracy**, low uncertainties and in-depth documentation are what make TraceCERT products so reliable. These solutions are traceable to at least two independent references; NIST traceability is guaranteed whenever possible. In addition, we have extensive packaging knowledge and we guarantee all certified values until the bottle is in the customer's hands.



16368-02
ISO 9001

What is the value of Sigma-Aldrich's double accreditation to the customer? Reliability! Every analytical laboratory will demonstrate the correctness of its measurement results. The use of accurate and well-documented standards is, therefore, the first step to achieving correct measurement

results. Our double accreditation, according to ISO/IEC 17025 and ISO Guide 34, is an explicit affirmation of our competence to produce, certify and supply certified reference materials. Our **customers can count on this competence** and refer to it. We know: Buying analytical standards is a matter of trust.

What about the price? These highest quality CRMs are competitively priced when compared to the products of other CRM manufacturers. When you check our website at sigma-aldrich.com/tracecert you will see that highest quality is not necessarily the most expensive.

Produced in double accredited
laboratory fulfilling
**ISO/IEC 17025 and
ISO Guide 34**

Manufacturing of Inorganic CRMs

The most accurate approach for the production of standards is high-precision weighing. Under ISO Guide 34 there is a particular focus on the quality of the starting materials and the entire manufacturing process including the choice of optimal packaging.



Only **materials of highest purity** are used for the production of *TraceCERT* standards. The starting materials are **characterized by two different approaches**: the direct measurement of the purity by the most accurate method (e.g. titrimetry or high-precision ICP-OES). These measurements are compared to an internationally accepted reference material (i.e. NIST, BAM). In addition the purity of

the starting materials is assigned by the “100% minus impurities” approach. Both approaches must lead to the same value within the range of their uncertainties. All starting materials are pretreated by surface etching or drying before they go to the high precision weighing room.

Gravimetric preparation using pure materials is practical and the most accurate realization of concentration units. **High-precision weighing** is a key step of the production, leading to direct traceability to the SI unit kilogram. The use of ultramicro balances with readability down to 100 ng in combination with a specially designed weighing room leads to maximum accuracy.

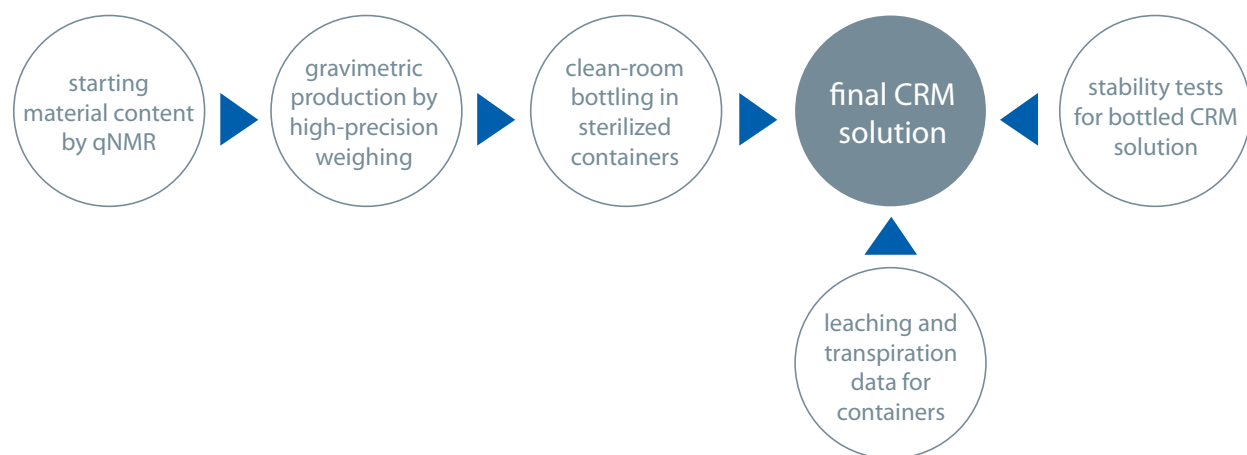
The weighed starting materials are dissolved in **ultrapure acids or bases** and then **precisely diluted** with ultrapure water to the final concentration. Also this operation is performed gravimetrically to achieve highest precision. **Homogenization** of the solution is achieved by overhead tumbling of the container for several hours. In the final bottling step, contamination is prevented by working under **clean room conditions** and by using PTFE-tubing and an inert peristaltic pump. After bottling, every batch is then compared to a second (whenever possible independent) reference material. Only when calculation and measurements are matching within their uncertainties (usually within 0.2 - 0.5 %) the batch is released for certification.

Manufacturing of Organic IC Solutions

The task of establishing traceability for organic compounds is most efficiently solved by ^1H quantitative NMR (qNMR). As a relative primary method, the big advantage of qNMR is the fact that the signal intensity of the integrals is in direct proportion to the number of hydrogen atoms leading to the signal. The chemical structure of the compound has no influence on the signal intensity. This allows for comparing different compounds quantitatively with high precision. Therefore, a small set of NIST traceable standards is sufficient to certify basically any organic compound. In other words, the direct response of a qNMR experiment is of highest accuracy, leading to certified values with low uncertainties.

With a few exceptions (like sodium oxalate where the compound carries no protons), the starting materials for our IC standard solutions of organic analytes are all certified by qNMR. The certified bulk material is transferred into a 60L PVDF container by high precision weighing and dissolved with high-purity water (specific conductivity of $18 \text{ M}\Omega\cdot\text{cm}$, total organic carbon at low ppb level and $0.2 \mu\text{m}$ filtered) until the calculated mass of the final solution is reached.

Equal to the inorganic standards, the solution is then homogenized by overhead tumbling of the container. After that, the final bottles are filled with solution under clean-room conditions using PTFE-tubing and a peristaltic pump.



Certification and Comprehensive Documentation

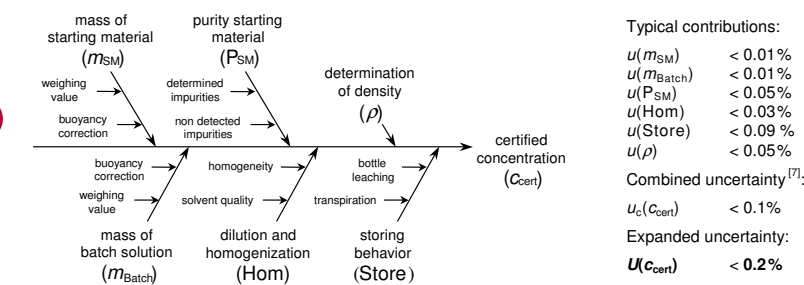
For each TraceCERT product, a detailed and comprehensive certificate of **up to four pages** is supplied, either delivered with the product (for the ICP standards) or downloadable from the Internet using product number and lot number (for the AAS and IC standards). **Example certificates** for every product can be downloaded from the Internet (sigma-aldrich.com/tracecert).

The certificates are in accordance with **ISO Guide 31**. Below you see an example of a certificate for a platinum ICP standard highlighting the most important features.

Lot Specific Content Including Uncertainties:

Certified value traceable to SI unit kg and uncertainty according to ISO Guide 35 ^[2] and Eurachem/CITAC Guide ^[3]		
Constituent	Certified value at 20 °C ^[4]	Expanded uncertainty [U = k·U _c ; k = 2]
Platinum	1000 mg L⁻¹ 976 mg kg⁻¹	2 mg L⁻¹ 2 mg kg⁻¹

Certified values are reported as mass per volume and as mass per mass.
Uncertainty budgets are obtained by summing up all the contributing influence parameters ("bottom-up" approach) and are illustrated by a cause-effect diagram:



Traceability Statement

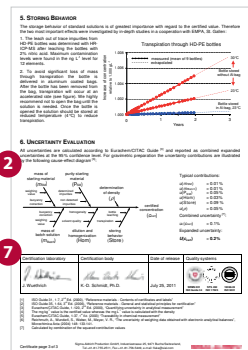
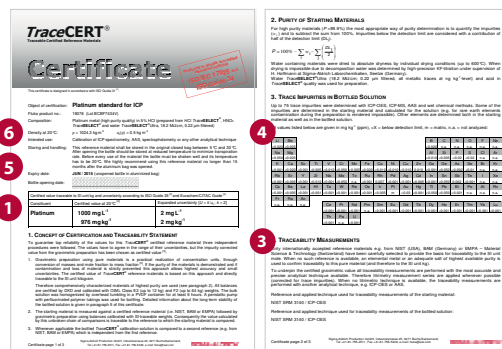
Reference and applied technique used for traceability measurements of the starting material: NIST SRM 3140 / ICP-OES
 Reference and applied technique used for traceability measurements of the bottled solution: NIST SRM 3140 / ICP-OES

Trace Impurities in Bottled Solution*

Up to 75 trace impurities, determined with ICP-OES, ICP-MS, AAS and wet chemical methods.

Li	Be	B	C	N	O	F	Ne										
<0.020	<0.005	<0.020	n.a.	n.a.	n.a.	n.a.	n.a.										
Na	Mg	Al	Si	P	S	Cl	Ar										
<0.050	<0.005	<0.010	<0.005	<0.02	<0.02	n.a.	n.a.										
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
<0.001	<0.020	<0.001	<0.005	<0.010	<0.050	<0.005	<0.020	<0.010	<0.010	<0.010	0.010	<0.001	<0.050	<0.002	<0.01	n.a.	n.a.
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
<0.001	<0.005	<0.001	<0.010	<0.001	<0.050	n.a.	<0.001	0.007	<0.001	<0.001	<0.005	<0.001	<0.050	0.002	<0.001	n.a.	n.a.
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	m	<0.03	<0.001	<0.050	<0.050	<0.001	n.a.	n.a.	n.a.
Fr	Ra	Ac	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
n.a.	n.a.	n.a.	<0.001	<0.001	<0.001	n.a.	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
			Th	Pa	U												
			<0.001	n.a.	<0.001												

*This is only reported for the ICP standard solutions. For the IC standard solutions, trace impurities of the most relevant ions are given



5 Expiration Date:
 Expiry date: **JUN / 2015**
 (unopened bottle in aluminized bag)

Bottle opening date: _____

6 Density:
 $\rho = 1024.3 \text{ kg m}^{-3}$ $u_c(\rho) = 0.5 \text{ kg m}^{-3}$

7 Signatures and Accreditation Stamps

Certification laboratory	Certification body	Date of release	Quality systems
J. Wuetrich	K.-D. Schmitt, Ph.D.	July 25, 2011	ISO 9001 ISO 17025 ISO 14001

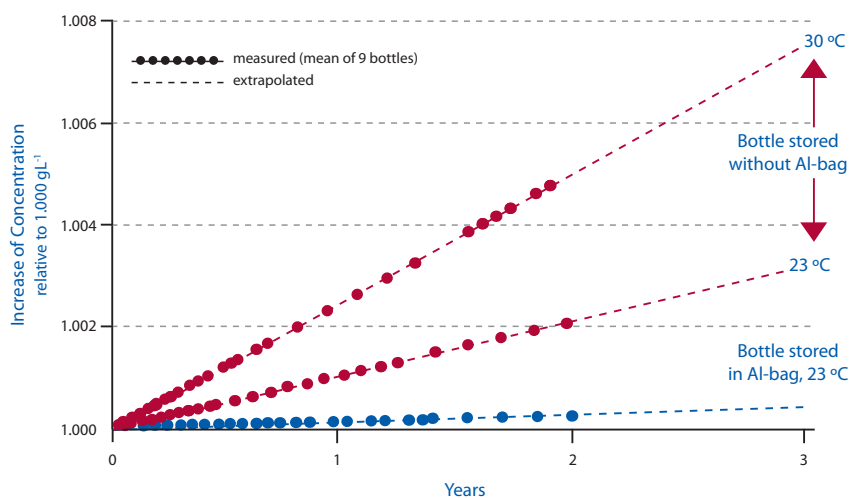
Packaging and Stability

The ideal container for standard solutions is totally inert, i.e., will not absorb the analyte, does not leach impurities into the solution, is impermeable to the solvent and atmosphere, is easy to handle and affordable. For *TraceCERT* standards we have developed the **most suitable container** fulfilling all of these criteria: the HDPE bottle. These bottles are extensively tested for leaching of impurities and the loss of weight by transpiration of the solvent was also investigated comprehensively as shown in the diagram below. The results of this study are also stated in the certificate of each *TraceCERT* product. For maximum shelf life, the bottles for ICP standards are sealed in aluminum bags to further prevent transpiration. Only this **special packaging** makes it possible to guarantee the ambitious specification of 0.2% uncertainty over the entire shelf life.

In the case of organic IC Standards, the HDPE bottles are x-ray sterilized and the bottled solution is additionally stabilized with sodium azide (about 5 mg/L) and filtered through a 0.2 μm membrane.



Transpiration Through HDPE Bottle



Sensitive trace analysis applications require extremely pure sample preparation reagents. Sigma-Aldrich offers a comprehensive range of reagents to satisfy all purity requirements.

Visit our website to view our products or obtain a copy of our Inorganic Trace Analysis brochure (code LBJ): sigma-aldrich.com/traceselect

TraceCERT Product Portfolio

The TraceCERT product line of ICP, AAS and IC standard solutions actually comprises over 200 products. Since we are continuously expanding the product range, we also recommend consulting our website at sigma-aldrich.com/tracecert. In addition to our broad catalog offering, we also offer custom standards (see page 11).

1000 mg/L Single Element Standard Solutions for AAS and ICP

AAS standards are supplied in 250 mL HDPE bottles (with some exceptions). Shelf life of these products is usually 3 years. The certificate can be downloaded from the Internet using product number and lot number.

ICP standards are supplied in 100 mL HDPE bottles and sealed in an aluminum bag. We can, therefore, guarantee an expiry of up to 4 years for the ICP standards. The printed certificate is delivered with the product.

Element (1000 mg/L)	Composition	Cat. No. AAS Standard	Package Size	Cat. No. ICP Standard	Package Size
Aluminum	Al(NO ₃) ₃ x 9H ₂ O + nitric acid	39435	250 mL	61935	100 mL
Antimony	Sb metal + nitric acid (+ hydrofluoric acid traces)	94117	250 mL	73495	100 mL
Arsenic	As ₂ O ₃ + nitric acid (+ NaOH for AAS)	39436	250 mL	01969	100 mL
Barium	BaCO ₃ + nitric acid	90092	250 mL	59943	100 mL
Beryllium	Be acetate + nitric acid	41856	250 mL	51985	100 mL
Bismuth	Bi metal + nitric acid	76668	250 mL	05719	100 mL
Boron	H ₃ BO ₃ + water	40591	250 mL	01932	100 mL
Cadmium	Cd metal + nitric acid	51994	250 mL	36379	100 mL
Calcium	CaCO ₃ + nitric acid	69349	250 mL	19051	100 mL
Cerium	CeO ₂ + nitric acid	53378	250 mL	16734	100 mL
Cesium	CsNO ₃ + nitric acid	67717	250 mL	96664	100 mL
Chromium	Cr(NO ₃) ₃ + nitric acid	02733	250 mL	74582	100 mL
Cobalt	Co metal + nitric acid	05202	250 mL	30329	100 mL
Copper	Cu metal + nitric acid	38996	250 mL	68921	100 mL
Dysprosium	Dy ₂ O ₃ + nitric acid	78247	100 mL	68339	100 mL
Erbium	Er ₂ O ₃ + nitric acid	38716	100 mL	05693	100 mL
Europium	Eu ₂ O ₃ + nitric acid	03734	100 mL	05779	100 mL
Gadolinium	Gd ₂ O ₃ + nitric acid	68837	100 mL	16639	100 mL
Gallium	Ga metal + nitric acid	52874	100 mL	16639	100 mL
Germanium	Ge semi-metal + nitric acid (hydrofluoric acid traces)	92685	250 mL	05419	250 mL
Gold	Au metal + hydrochloric acid (nitric acid traces)	08269	100 mL	38168	100 mL
Hafnium	Hf metal + nitric acid (hydrofluoric acid traces)	55816	250 mL	04617	100 mL
Holmium	Ho ₂ O ₃ + nitric acid	18039	100 mL	01541	100 mL
Indium	In metal + nitric acid	42225	100 mL	00734	100 mL
Iron	Fe metal + nitric acid	16596	250 mL	43149	100 mL
Lanthanum	La ₂ O ₃ + nitric acid	43678	100 mL	11523	100 mL
Lead	Pb(NO ₃) ₂ + nitric acid	16595	250 mL	41318	100 mL
Lithium	Li ₂ CO ₃ + nitric acid	59916	250 mL	12292	100 mL
Lutetium	Lu ₂ O ₃ + nitric acid	38476	100 mL	03909	100 mL
Magnesium	Mg metal + nitric acid	42992	250 mL	30083	100 mL
Manganese	Mn metal + nitric acid	77036	250 mL	74128	100 mL
Mercury	Hg metal + nitric acid	16482	100 mL	28941	100 mL
Molybdenum	Mo metal + hydrochloric acid + (nitric acid traces)	67210	250 mL	68780	100 mL
Neodymium	Nd ₂ O ₃ + nitric acid	41695	100 mL	04730	100 mL
Nickel	Ni metal + nitric acid	42242	250 mL	28944	100 mL
Niobium	Nb metal + nitric acid (hydrofluoric acid traces)	42887	100 mL	67913	100 mL
Palladium	Pd metal + hydrochloric acid (nitric acid traces)	78437	100 mL	77091	100 mL
Phosphorus	H ₃ PO ₄ + water	51474	250 mL	38338	100 mL
Platinum	Pt metal + hydrochloric acid (nitric acid traces)	47037	100 mL	19078	100 mL

Element (1000 mg/L)	Composition	Cat. No. AAS Standard	Package Size	Cat. No. ICP Standard	Package Size
Potassium	KNO ₃ + nitric acid	96665	250 mL	06335	100 mL
Rhodium	RhCl ₃ + hydrochloric acid	11561	100 mL	04736	100 mL
Rubidium	RbNO ₃ + nitric acid	55727	100 mL	01444	100 mL
Scandium	Sc ₂ O ₃ + nitric acid	68418	100 mL	92279	100 mL
Selenium	Se metal + nitric acid	89498	250 mL	50002	100 mL
Silicon	Si metal + NaOH	16259	250 mL	15747	100 mL
Silicon	Si metal + nitric acid + hydrofluoric acid	--	--	08729	100 mL
Silver	Ag metal + nitric acid	39361	250 mL	12818	100 mL
Sodium	NaNO ₃ + nitric acid	05201	250 mL	00462	100 mL
Strontium	Sr(NO ₃) ₂ + nitric acid	51287	250 mL	75267	100 mL
Sulfur	H ₂ SO ₄ + water	18020	250 mL	18021	100 mL
Tantalum	Ta metal + nitric acid (hydrofluoric acid traces)	40413	100 mL	16641	100 mL
Tellurium	Te semi-metal + nitric acid + hydrofluoric acid	92027	250 mL	78358	100 mL
Terbium	Tb ₂ O ₃ + nitric acid	50356	100 mL	44881	100 mL
Thallium	TlNO ₃ + nitric acid	75159	100 mL	51873	100 mL
Thulium	Tm ₂ O ₃ + nitric acid	59854	100 mL	01496	100 mL
Tin	Sn metal + hydrochloric acid	74244	250 mL	92615	100 mL
Titanium	Ti metal + nitric acid	04689	100 mL	12237	100 mL
Tungsten	W metal + nitric acid (hydrofluoric acid traces)	53465	100 mL	50334	100 mL
Vanadium	V ₂ O ₅ + nitric acid	02334	250 mL	18399	100 mL
Yttrium	Y ₂ O ₃ + nitric acid	40423	250 mL	01357	100 mL
Zinc	Zn metal + nitric acid	18827	250 mL	18562	100 mL
Zirconium	Zr metal + nitric acid + hydrofluoric acid	73574	250 mL	51244	100 mL

10,000 mg/L Single Element Standard Solutions for AAS and ICP

Element (10,000 mg/L)	Composition	Cat. No.	Package Size
Aluminum	Al(NO ₃) ₃ x 9H ₂ O + nitric acid	41377	100 mL
Antimony	Sb metal + nitric acid + hydrofluoric acid	91482	100 mL
Boron	H ₃ BO ₃ + ammonium hydroxid solution	18822	100 mL
Cadmium	Cd metal + nitric acid	90006	100 mL
Calcium	CaCO ₃ + nitric acid	94458	100 mL
Cesium	CsNO ₃ + nitric acid	79261	100 mL
Chromium	Cr(NO ₃) ₃ + nitric acid	93104	100 mL
Cobalt	Co metal + nitric acid	01488	100 mL
Copper	Cu metal + nitric acid	94459	100 mL
Iron	Fe metal + nitric acid	56209	100 mL
Lead	Pb(NO ₃) ₂ + nitric acid	39082	100 mL
Magnesium	Mg metal + nitric acid	80759	100 mL
Manganese	Mn(NO ₃) ₂ x 4H ₂ O + nitric acid	42071	100 mL
Nickel	Ni metal + nitric acid	19013	100 mL
Palladium	Pd metal + hydrochloric acid (nitric acid traces)	50719	100 mL
Phosphorous	H ₃ PO ₄ + water	19916	100 mL
Potassium	KNO ₃ + nitric acid	68371	100 mL
Sodium	NaNO ₃ + nitric acid	39924	100 mL
Sulfur	H ₂ SO ₄ + water	94430	100 mL
Tin	Sn metal + nitric acid + hydrofluoric acid	42991	100 mL
Titanium	Ti metal + nitric acid + hydrofluoric acid	44973	100 mL
Tungsten	W metal + nitric acid + hydrofluoric acid	50938	100 mL
Vanadium	V metal + nitric acid	44712	100 mL
Yttrium	Y ₂ O ₃ + nitric acid	02312	100 mL
Zinc	Zn metal + nitric acid	68961	100 mL

1000 mg/L Single Ion Standards for IC

All IC standards are supplied in HDPE bottles. As a unique feature for these IC standards we list the most common trace impurities that are relevant for the IC separation.

Inorganic Anions (1000 mg/L)	Composition	Cat. No.	Package Size
Bromide	NaBr + water	43147	100 mL
Chloride	NaCl + water	39883	100 mL
Chromate	K ₂ CrO ₄ + water	40121	100 mL
Cyanide	K ₂ Zn(CN) ₄ + water	90157	100 mL
Fluoride	NaF + water	77365	100 mL
Iodide	KI + water	41271	100 mL
Nitrate	NaNO ₃ + water	74246	100 mL
Nitrate Nitrogen	NaNO ₃ + water	53638	100 mL
Nitrite	NaNO ₂ + water (NaOH stabilized)	67276	100 mL
Nitrite Nitrogen	NaNO ₂ + water (NaOH stabilized)	36427	100 mL
Phosphate	Na ₂ HPO ₄ + water	38364	100 mL
Sulfate	Na ₂ SO ₄ + water	90071	100 mL

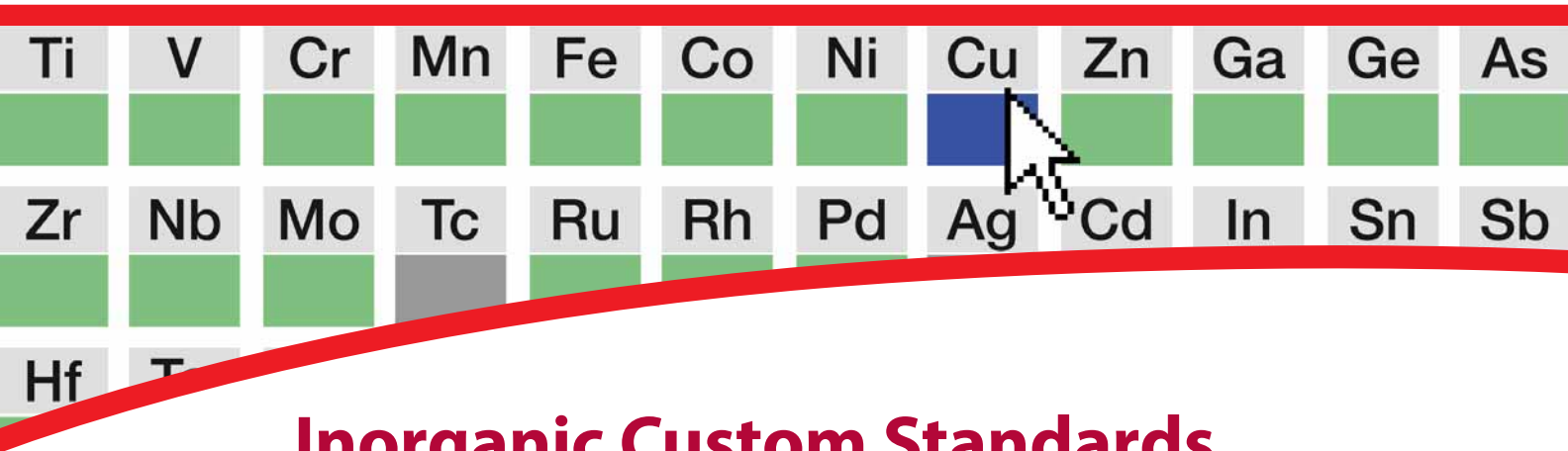
Organic Anions (1000 mg/L)	Composition	Cat. No.	Package Size
Acetate	Acetic acid, NaOH, water	51791	100 mL
Adipate	Adipic acid + water	40968	100 mL
Benzoate	Benzoic acid, water	40497	100 mL
Butyrate	Sodium butyrate, water	08089	100 mL
Citrate	Citric acid, water	96068	100 mL
Formate	Calcium formate, water	44293	100 mL
Glutarate	Glutaric acid + water	07438	100 mL
Glycolate	Glycolic acid + water	07391	100 mL
Lactate	Magnesium L-lactate + water	07096	100 mL
Malate	L(-)-Malic acid + water	06994	100 mL
Maleate	Maleic acid, water	06908	100 mL
Malonate	Malonic acid, water	42412	100 mL
Oxalate	Sodium oxalate, water	73139	100 mL
Phthalate	Potassium phthalate monobasic, water	90677	100 mL
Propionate	Sodium propionate, water	51716	100 mL
Succinate	Succinic acid + water	43057	100 mL
Tartrate	L-(+)-Tartaric acid, water	43484	100 mL

Inorganic Cations (1000 mg/L)	Composition	Cat. No.	Package Size
Ammonium	NH ₄ Cl + water	59755	100 mL
Ammonium (Nitrogen)	NH ₄ Cl, water	89503	100 mL
Barium	BaCO ₃ + nitric acid	87142	100 mL
Cadmium	Cd metal + nitric acid	69679	100 mL
Calcium	CaCO ₃ + nitric acid	39865	100 mL
Cobalt	Co metal + nitric acid	49594	100 mL
Copper	Cu metal + nitric acid	40786	100 mL
Lead	Pb(NO ₃) ₂ + nitric acid	51777	100 mL
Lithium	Li ₂ CO ₃ + nitric acid	59878	100 mL
Magnesium	Mg metal + nitric acid	89441	100 mL
Manganese	Mn metal + nitric acid	51439	100 mL
Nickel	Ni metal + nitric acid	42637	100 mL
Potassium	KNO ₃ + water	53337	100 mL
Sodium	NaNO ₃ + water	43492	100 mL
Strontium	Sr(NO ₃) ₂ + nitric acid	42151	100 mL
Zinc	Zn metal + nitric acid	67902	100 mL

Multiion Standards for IC

All Standards are packaged in a HDPE bottle. The starting materials for the two PRIMUS primary multiion standards were certified by EMPA (Eidgenössische Materialprüfungs- und Forschungsanstalt) and BAM (Bundesamt für Materialforschung und -prüfung, Germany).

Multiion Standards	Description and Composition	Package Size
89886	Primary Multi Anion Standard Solution (PRIMUS), certified for ion chromatography, Reference material traceable to SI, 10.0 mg/kg \pm 0.2% F ⁻ , Cl ⁻ , NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻ each anion	50 mL
89316	Primary Multi Cation Standard Solution (PRIMUS), certified for ion chromatography, Reference material traceable to SI, 10.0 mg/kg \pm 0.2% Li ⁺ , Na ⁺ , K ⁺ , Mg ²⁺ , Ca ²⁺ each cation	50 mL
91286	Multi Cation Standard 1 for IC, Ca: 1000 mg/L; K: 200 mg/L; Li: 50 mg/L; Mg: 200 mg/L; Na: 200 mg/L	100 mL



Inorganic Custom Standards An Interactive Online Platform

In addition to our comprehensive portfolio of catalog products, we also offer you a custom service where you can define your own multi-component standards using our Inorganic Custom Standards Online Platform:

sigma-aldrich.com/csp



For all *TraceCERT* Custom Standards, we guarantee:

- Certification under double accreditation following **ISO/IEC 17025** and **ISO Guide 34**
- Traceability to at least two independent references (i.e. NIST, BAM or SI unit kg)
- Printed certificate according to ISO Guide 31
- Light- and gas-tight aluminum foil bag packaging allowing a shelf life of up to four years

With a few simple mouse clicks you can specify the desired characteristics among the following:

- Element standard
- Ion standard
- Defining matrix
- Analytes
- Concentrations

The Custom Standards Platform is a **dynamic web page**: elements, ions and matrices can only be chosen if the combinations are chemically allowed.

After your request has been **submitted online**, we will evaluate the production costs and respond with a quotation by e-mail.

It's easy! Try it out!

Sigma-Aldrich® Worldwide Offices

Argentina

Free Tel: 0810 888 7446
Tel: (+54) 11 4556 1472
Fax: (+54) 11 4552 1698

Australia

Free Tel: 1800 800 097
Free Fax: 1800 800 096
Tel: (+61) 2 9841 0555
Fax: (+61) 2 9841 0500

Brazil

Free Tel: 0800 701 7425
Tel: (+55) 11 3732 3100
Fax: (+55) 11 5522 9895

Canada

Free Tel: 1800 565 1400
Free Fax: 1800 265 3858
Tel: (+1) 905 829 9500
Fax: (+1) 905 829 9292

Chile

Tel: (+56) 2 495 7395
Fax: (+56) 2 495 7396

People's Republic of China

Free Tel: 800 819 3336
Tel: (+86) 21 6141 5566
Fax: (+86) 21 6141 5567

Czech Republic

Tel: (+420) 246 003 200
Fax: (+420) 246 003 291

Denmark

Tel: (+45) 43 56 59 00
Fax: (+45) 43 56 59 05

France

Free Tel: 0800 211 408
Free Fax: 0800 031 052
Tel: (+33) 474 82 28 88
Fax: (+33) 474 95 68 08

Germany

Free Tel: 0800 51 55 000
Free Fax: 0800 64 90 000
Tel: (+49) 89 6513 0
Fax: (+49) 89 6513 1169

India

Telephone

Bangalore: (+91) 80 6621 9400
New Delhi: (+91) 11 4358 8000
Mumbai: (+91) 22 4087 2364
Pune: (+91) 20 4146 4700
Hyderabad: (+91) 40 3067 7450
Kolkata: (+91) 33 4013 8000

Fax

Bangalore: (+91) 80 6621 9550
New Delhi: (+91) 11 4358 8001
Mumbai: (+91) 22 2579 7589
Pune: (+91) 20 4146 4777
Hyderabad: (+91) 40 3067 7451
Kolkata: (+91) 33 4013 8016

Ireland

Free Tel: 1800 200 888
Free Fax: 1800 600 222
Tel: +353 (0) 402 20370
Fax: +353 (0) 402 20375

Israel

Free Tel: 1 800 70 2222
Tel: (+972) 8 948 4222
Fax: (+972) 8 948 4200

Italy

Free Tel: 800 827 018
Tel: (+39) 02 3341 7310
Fax: (+39) 02 3801 0737

Japan

Tel: (+81) 3 5796 7300
Fax: (+81) 3 5796 7315

Korea

Free Tel: (+82) 80 023 7111
Free Fax: (+82) 80 023 8111
Tel: (+82) 31 329 9000
Fax: (+82) 31 329 9090

Luxembourg

Tel: (+32) 3 899 1301
Fax: (+32) 3 899 1311

Malaysia

Tel: (+60) 3 5635 3321
Fax: (+60) 3 5635 4116

Mexico

Free Tel: 01 800 007 5300
Free Fax: 01 800 712 9920
Tel: (+52) 722 276 1600
Fax: (+52) 722 276 1601

The Netherlands

Tel: (+31) 78 620 5411
Fax: (+31) 78 620 5421

New Zealand

Free Tel: 0800 936 666
Free Fax: 0800 937 777
Tel: (+61) 2 9841 0555
Fax: (+61) 2 9841 0500

Poland

Tel: (+48) 61 829 01 00
Fax: (+48) 61 829 01 20

Portugal

Free Tel: 800 202 180
Free Fax: 800 202 178
Tel: (+351) 21 924 2555
Fax: (+351) 21 924 2610

Russia

Tel: (+7) 495 621 5828
Fax: (+7) 495 621 6037

Singapore

Tel: (+65) 6779 1200
Fax: (+65) 6779 1822

Slovakia

Tel: (+421) 255 571 562
Fax: (+421) 255 571 564

South Africa

Free Tel: 0800 1100 75
Free Fax: 0800 1100 79
Tel: (+27) 11 979 1188
Fax: (+27) 11 979 1119

Spain

Free Tel: 900 101 376
Free Fax: 900 102 028
Tel: (+34) 91 661 99 77
Fax: (+34) 91 661 96 42

Sweden

Tel: (+46) 8 742 4200
Fax: (+46) 8 742 4243

Switzerland

Free Tel: 0800 80 00 80
Free Fax: 0800 80 00 81
Tel: (+41) 81 755 2511
Fax: (+41) 81 756 5449

Thailand

Tel: (+66) 2 126 8141
Fax: (+66) 2 126 8080

United Kingdom

Free Tel: 0800 717 181
Free Fax: 0800 378 785
Tel: (+44) 1747 833 000
Fax: (+44) 1747 833 313

United States

Toll-Free: 800 325 3010
Toll-Free Fax: 800 325 5052
Tel: (+1) 314 771 5765
Fax: (+1) 314 771 5757

Vietnam

Tel: (+84) 8 3516 2810
Fax: (+84) 8 6258 4238

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World Headquarters
3050 Spruce St.
St. Louis, MO 63103
(314) 771-5765
sigma-aldrich.com

