

Laboratory standards and chemicals



analytika®

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ANALYTIKA[®], spol. s r.o.

ANALYTIKA[®], spol. s r.o. is a Czech company with more than 25 years of experience in manufacturing of calibration standard solutions. We offer Certified Reference Materials, QC standards, reagents and other laboratory solutions.

Nowadays ANALYTIKA[®], spol. s r.o. is the main supplier of calibration standard solutions product for control and quality assurance in Czech laboratories, nevertheless the major part of our production is delivered to foreign countries.

In 2015, the Department of Reference Materials acquired the Certificate of accreditation for reference materials producers in accordance with ČSN EN ISO/IEC 17025:2005 and TNI ISO Guide 34:2013.

Our main goal is providing our customers with high quality products, reasonable prices and fast service.

QUALITY MANAGEMENT

ANALYTIKA[®], spol. s r.o.
is certified according to ISO 9001:2008.

Competence of Reference Material producer

Reference Materials including Certified Reference Materials are manufactured in accordance with requirements of ISO Guide 30 - 35 by Department of Reference Materials accredited according to ČSN EN ISO/IEC 17025:2005 and TNI ISO Guide 34:2013.

Quality control

Testing and calibration needed in the manufacturing process of Reference Materials are conducted in accordance with ISO 17025 in our testing laboratory accredited by Czech Accreditation Institute according to ČSN EN ISO/IEC 17025:2005.



ORDERING AND SUPPORT

It would be our pleasure to respond to your inquiries, receive and process your orders and offer the support you deserve. You can contact our qualified sales representatives or place your order by email or fax.

CONTACT US

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DOCUMENTATION

All of our products are delivered with documentation including all information necessary for their proper use and fulfills the requirements of corresponding ISO documents and current legislation.

Documentation of a product usually consists of a Certificate or an Identification Sheet, an appendix to the Certificate or the Identification Sheet and a Safety Data Sheet.

CRM DOCUMENTATION

CRM CERTIFICATE

The CRM Certificate is issued for certified calibration solutions (for ICP, ICP-MS, AAS, AES, IC), buffers and conductivity standards. The Certificate is established in a compliance with ISO Guide 31.

The Certificate contains, as well as other aspects:

- » Primary substance and its purity
- » Certified concentration value and its uncertainty in mg/l
- » The density of the solution and its uncertainty in mg/kg
- » Means of certification and realization of metrological traceability
- » Experimentally detected trace impurities

RM DOCUMENTATION

IDENTIFICATION SHEET FOR RM MANUFACTURED WITHIN THE SCOPE OF ACCREDITATION

The Identification Sheet is issued for calibration solutions (for ICP, ICP-MS, AAS, AES, IC), buffers and conductivity standards. The Identification Sheet is formulated in accordance with ISO Guide 31. It includes characteristics of the product and its traceability to certified reference materials ASTASOL®.

IDENTIFICATION SHEET FOR RM MANUFACTURED OUT OF SCOPE OF ACCREDITATION

The Identification Sheet is issued for adjustment solutions, tuning solutions ICP, ICP-MS and chromatography standards. The Identification Sheet is formulated in accordance with ISO Guide 31.

ANNEX TO THE CRM CERTIFICATE AND RM IDENTIFICATION SHEET

The annex to the CRM Certificate and the Identification Sheet includes information about preparation, usage and storing aqueous calibration solutions manufactured within the scope of accreditation.

FURTHER DOCUMENTATION

DECLARATION OF QUALITY

A Declaration of Quality goes with the auxiliary solutions.

PROTOCOL OF ANALYSIS

A protocol of analysis is issued for acids and reagents.

SAFETY DATA SHEET

Products classified as hazardous are distributed with a Safety Data Sheet compiled in compliance with the applicable legislations. It is accessible publicly or available upon request.

AN EXAMPLE OF A CRM CERTIFICATE FOR A SILVER CALIBRATION SOLUTION

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ISO GUIDE 34
 ISO/IEC 17025
 (ISO 9001)

CERTIFICATE
Aqueous calibration solution ASTASOL[®]
 This certificate is designed in accordance with ISO Guide 31:2000

Category: Certified reference material
Analyte: Silver (Ag)
Product code: AN 9001 (1N)
Starting primary compound and its purity: Ag metal, 99,9999%
Matrix: 2% HNO₃ (v/v), prepared from sub boil distilled HNO₃ (ANALPURE[®]) and ultrapure demineralized water (resistivity $\leq 18 \text{ M}\Omega \cdot \text{cm}$, 0.22 μm filtered)

Density and its expanded uncertainty (k = 2): 1.0109 ± 0.0005 g/cm³ (at 20 °C)

Certified value of concentration and its expanded uncertainty (k = 2) at 20 °C
1 000 ± 2 mg/l
989 ± 3 mg/kg*
 *Mass fraction in mg/kg is derived from density

Specification:
Batch No.: 0001
The date of production: 8.2.2016
Shelf life: 2 years from the date of production
Expiration time: 12 months from the first opening of the bottle (within shelf life period)
Date of the first opening of the bottle: (also identify on the label of the bottle)
Intended use: For calibration and validation of analytical methods analysing aqueous solutions such as atomic spectrometry (AAS, AES, ICP-OES, ICP-MS), molecular absorption spectrometry (colorimetry), ion chromatography and selected electroanalytical methods.

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ANALYTIKA[®], spol. s r.o., Oddělení referenčních materiálů / Department of reference materials
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Starting material and its purity

Density

Certified value and uncertainty

Life time

Bottle opening date

Intended use

Traceable to SI units

Trace impurities in bottled solution

How to store and use

Certification and traceability:

This CRM is certified on the basis of gravimetric preparation. This procedure also ensures a direct traceability to SI unit – kg. Certified concentration, its uncertainty and traceability were verified by gravimetric determination of silver (as AgCl) and by simultaneous determination of silver in independent reference solution (SRM NIST 3151).

Trace impurities in bottled solution (in mg/l):

Determination of trace impurities was performed by AAS, ICP-OES and ICP-MS. Impurity levels are supplied only for information of the user and should not be used as calibration data.

Li	Be	B	C	N	O	F										
<0.1	<0.002	<0.1	N.A.	31	31	N.A.										
Na	Mg	Al	Si	P	S	Cl										
<0.05	<0.003	<0.01	0.1	0.1	0.1	N.A.										
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Cu	Ni	Co	Zn	Ga	Ge	As	Se	Br
<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.005	<0.001	0.02	0.02	<0.001	<0.1	0.02	0.001	0.1	0.02	N.A.
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I
<0.05	<0.01	<0.05	<0.01	<0.05	<0.02	N.A.	<0.05	<0.1	<0.001	A	<0.001	<0.05	<0.001	<0.01	<0.1	N.A.
Au	Hg	Tl	Pb	Bi	Po	At	Rn	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am
<0.02	<0.01	<0.05	0.1	<0.05	<0.05	<0.02	<0.2	<0.2	<0.05	<0.001	<0.1	<0.001	0.001	<0.1	<0.001	0.001
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu			
<0.5	0.1	<0.05	<0.02	<0.01	0.1	<0.05	<0.01	<0.1	<0.05	<0.01	<0.01	<0.01	<0.02			
Th	U															
0.1	0.1															

M = matrix, N.A. = not analysed, <x> = below detection limit, A = analyte

Homogeneity and stability:

It has been demonstrated that this CRM is homogeneous and its stability is guaranteed during the whole shelf life provided the solution is kept under conditions presented below.

Storing and instruction for use:

This CRM has to be stored in the original closed bottle between 5 – 30 °C. The producer guarantees a declared shelf life and expiration time provided the CRM is properly stored and professionally handled. The temperature of the solution must be 20 ± 0.5 °C before every use. After use, the bottle has to be immediately tightly capped and the screw cap sealed with parafilm. It is necessary to record the first opening of the bottle. From this date, the expiration time starts. It is extremely important to cover the screw cap and the neck of the bottle with a parafilm layer after each opening to prevent vapour phase losses.

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Note:
 Detailed information about the production, homogeneity, stability, coding, characterization and storing of this CRM are described in Annex to this Certificate which is its integral part.

Producer:
 ANALYTIKA[®], spol. s r.o.
 Department of reference materials
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Quality management systems:
 ČSN EN ISO 9001:2009
 ČSN EN ISO/IEC 17025:2005 and TNI Guide ISO 34:2013

L 1684
 Analytika, spol. s r.o., Department of RM, Reference Materials Producer No. 1684 accredited by CAI according to ČSN EN ISO/IEC 17025:2005 and TNI Guide ISO 34:2013

Quality manager (production): Ing. Lenka Janečková
Quality manager (testing laboratory): Mgr. Petr Šmejkal

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Contact us

Quality systems and accreditation

CUSTOM STANDARDS

Have you not chosen from our basic offer? Ask for preparation of solutions according to your requirements!!!

Our personnel, having wide and long-term experience with development and production not only calibration solutions, are ready to use their experience for creating products which will meet your needs and requirements.

CUSTOM-MADE REFERENCE MATERIALS

- » RM for ICP, ICP-MS, AAS, IC ...
- » Tuning solutions and internal standards for ICP, ICP-MS
- » RM for chromatography
- » Matrix RM
- » Samples for interlaboratory comparisons (PT schemes)

WHAT DO WE NEED TO KNOW?

- » Category (RM/CRM, adjustment solution etc.)
- » Analyte(s) and their concentration
- » Type of the solution matrix
- » Required volume of the solution and the required packaging
- » Delivery time

HOW TO ORDER

You can contact our sales department with your requirements by phone, email or fax. Our sales representatives will take care of any enquiries you may have.



PACKAGING MATERIALS

Our products are delivered in various types of containers. When choosing the material of the container, we emphasize quality and take into account intended usage of the product. We opt for containers which enable easy and safe handling and, most importantly, meet the safety regulations for transportation of hazardous materials.

Prior to filling, the bottles and caps are leached with diluted acids, washed repeatedly with deionised water and then thoroughly dried.

Amber or transparent HDPE bottles, amber or transparent borosilicate bottles and LDPE, PP, PS bottles are used for packing most often.

VOLUME

Our products are available in a wide range of volumes, from 25 ml to 1,000 ml as a standard, in the case of custom solutions the volume can be even bigger. Volumes offered are always specified at the beginning of each chapter or particular product.

HOW TO ORDER

You can order all of our products via email, fax, and mail. Just indicate the product code, required volume and the number of units. Our sales representatives will send you the confirmation of your order immediately.

If any advice is needed, please specify your requirements and our personnel will get in touch and offer a right solution.

How to create Order number?

Product code	Volume in ml
AN90011N	100
Order number	
AN90011N-100	

TRANSPORT

Most of our products are classified as hazardous and thus it is necessary to follow strictly the transport rules. In a case that the transport needs special conditions, the transport requirements are indicated in the documentation of specific products.

STORAGE

The products need to be stored in their original packing under the conditions given by the producer. The producer guarantees a given period of validity / shelf life provided only if the materials are handled properly. Specific conditions such as how to store and handle a particular product are stated in its documentation.

The life time (shelf life) is the period when CRM and RM keep their certified or assigned values within the rank of associated uncertainties.

The expiration time (period of validity) is the time during which the producer guarantees the stability of CRM and RM from their opening (within a life time of RM) and is stated as a specific date.

TERMS OF USE

ANALYTIKA®, spol. s r.o. products are intended for laboratory use only. They are not intended for production of remedies, food or domestic usage. Only qualified personnel are allowed to handle this products.

The responsibility for the safe handling and use of these products rests solely with the buyer or user.



CERTIFIED REFERENCE MATERIALS

Single element standards ASTASOL®

- » For calibration and validation of analytical methods analysing aqueous solutions such as atomic spectrometry (AAS, AES, ICP-OES, ICP-MS), molecular absorption spectrometry (colorimetry) and selected electroanalytical methods
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Available in concentrations 10 mg/l, 100 mg/l, 1,000 mg/l and 10,000 mg/l
- » Directly traceable to SI units
- » Controlled with primary or instrumental analytical methods and independent standards (e.g. NIST SRM)
- » Prepared from high purity starting material, sub boil distilled acids and ultrapure demineralized water (resistivity ~ 18MΩ.cm)
- » Delivered in amber HDPE or glass laboratory grade bottles
- » Expiration time 12 months, wherever possible
- » Supplied with the Certificate designed in accordance with ISO Guide 31
- » Available in volumes 30 ml, 50 ml, 100 ml, 250 ml and 500 ml

1,000 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ag (Silver)	2% HNO ₃	1,000 ± 2	Ag	AN90011N
Al (Aluminium)	5% HCl	1,000 ± 2	Al	AN90021C
Al (Aluminium)	5% HNO ₃	1,000 ± 2	Al	AN90021N
As (Arsenic)	2% HNO ₃	1,000 ± 2	As	AN90031N
Au (Gold)	5% HCl	1,000 ± 2	Au	AN90041C
B (Boron)	H ₂ O	1,000 ± 2	H ₃ BO ₃	AN90051H
Ba (Barium)	2% HCl	1,000 ± 2	BaCO ₃	AN90061C
Ba (Barium)	2% HNO ₃	1,000 ± 2	BaCO ₃	AN90061N
Be (Beryllium)	2% HNO ₃	1,000 ± 2	Be	AN90071N
Bi (Bismuth)	5% HNO ₃	1,000 ± 2	Bi	AN90081N
Ca (Calcium)	2% HCl	1,000 ± 2	CaCO ₃	AN90091C
Ca (Calcium)	2% HNO ₃	1,000 ± 2	CaCO ₃	AN90091N
Cd (Cadmium)	2% HCl	1,000 ± 2	Cd	AN90101C
Cd (Cadmium)	2% HNO ₃	1,000 ± 2	Cd	AN90101N
Ce (Cerium)	5% HNO ₃	1,000 ± 2	Ce(NO ₃) ₃ ·6H ₂ O	AN90111N
Co (Cobalt)	2% HCl	1,000 ± 2	Co	AN90121C
Co (Cobalt)	2% HNO ₃	1,000 ± 2	Co	AN90121N
Cr (Chromium)	2% HCl	1,000 ± 2	Cr	AN90131C
Cr (Chromium)	2% HNO ₃	1,000 ± 2	Cr(NO ₃) ₃ ·9H ₂ O	AN90131N
Cs (Cesium)	H ₂ O	1,000 ± 2	CsCl	AN90141H
Cs (Cesium)	2% HNO ₃	1,000 ± 2	CsNO ₃	AN90141N
Cu (Copper)	2% HCl	1,000 ± 2	Cu	AN90151C
Cu (Copper)	2% HNO ₃	1,000 ± 2	Cu	AN90151N
Dy (Dysprosium)	2% HNO ₃	1,000 ± 2	Dy ₂ O ₃	AN90161N
Er (Erbium)	2% HNO ₃	1,000 ± 2	Er ₂ O ₃	AN90171N
Eu (Europium)	2% HNO ₃	1,000 ± 2	Eu ₂ O ₃	AN90181N
Fe (Iron)	5% HCl	1,000 ± 2	Fe	AN90191C
Fe (Iron)	2% HNO ₃	1,000 ± 2	Fe	AN90191N
Ga (Gallium)	2% HNO ₃	1,000 ± 2	Ga	AN90201N
Gd (Gadolinium)	2% HNO ₃	1,000 ± 2	Gd ₂ O ₃	AN90211N
Ge (Germanium)	1% HF + 5% HNO ₃	1,000 ± 2	Ge	AN90221FN

1,000 mg/l Standards (continued)

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Hf (Hafnium)	1% HF + 5% HNO ₃	1,000 ± 2	Hf	AN90231FN
Hg (Mercury)	5% HNO ₃	1,000 ± 2	Hg	AN90241N
Ho (Holmium)	2% HNO ₃	1,000 ± 2	Ho ₂ O ₃	AN90251N
In (Indium)	2% HNO ₃	1,000 ± 2	In	AN90261N
Ir (Iridium)	5% HCl	1,000 ± 5	(NH ₄) ₂ IrCl ₆	AN90271C
K (Potassium)	H ₂ O	1,000 ± 2	KCl	AN90281H
K (Potassium)	2% HNO ₃	1,000 ± 2	KNO ₃	AN90281N
La (Lanthanum)	2% HNO ₃	1,000 ± 2	La ₂ O ₃	AN90291N
Li (Lithium)	2% HCl	1,000 ± 2	Li ₂ CO ₃	AN90301C
Li (Lithium)	2% HNO ₃	1,000 ± 2	Li ₂ CO ₃	AN90301N
Lu (Lutetium)	2% HNO ₃	1,000 ± 2	Lu ₂ O ₃	AN90311N
Mg (Magnesium)	2% HCl	1,000 ± 2	Mg	AN90321C
Mg (Magnesium)	2% HNO ₃	1,000 ± 2	Mg	AN90321N
Mn (Manganese)	2% HCl	1,000 ± 2	Mn	AN90331C
Mn (Manganese)	2% HNO ₃	1,000 ± 2	Mn	AN90331N
Mo (Molybdenum)	2% NH ₄ OH	1,000 ± 2	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	AN90341A
Na (Sodium)	H ₂ O	1,000 ± 2	NaCl	AN90351H
Na (Sodium)	2% HNO ₃	1,000 ± 2	NaNO ₃	AN90351N
Nb (Niobium)	1% HF + 5% HNO ₃	1,000 ± 2	Nb	AN90361FN
Nd (Neodymium)	2% HNO ₃	1,000 ± 2	Nd ₂ O ₃	AN90371N
Ni (Nickel)	2% HCl	1,000 ± 2	Ni	AN90381C
Ni (Nickel)	2% HNO ₃	1,000 ± 2	Ni	AN90381N
Os (Osmium)	5% HCl	1,000 ± 5	(NH ₄) ₂ OsCl ₆	AN90391C
P (Phosphorus)	0.05% H ₂ SO ₄	1,000 ± 2	NH ₄ H ₂ PO ₄	AN90401S
Pb (Lead)	2% HNO ₃	1,000 ± 2	Pb	AN90411N
Pd (Palladium)	5% HCl	1,000 ± 2	Pd	AN90421C
Pr (Praseodymium)	2% HNO ₃	1,000 ± 2	Pr ₆ O ₁₁	AN90431N
Pt (Platinum)	5% HCl	1,000 ± 2	Pt	AN90441C
Rb (Rubidium)	H ₂ O	1,000 ± 2	RbCl	AN90451H
Rb (Rubidium)	2% HNO ₃	1,000 ± 2	RbNO ₃	AN90451N
Re (Rhenium)	H ₂ O	1,000 ± 2	NH ₄ ReO ₄	AN90461H
Rh (Rhodium)	5% HCl	1,000 ± 5	(NH ₄) ₃ RhCl ₆	AN90471C
Ru (Ruthenium)	5% HCl	1,000 ± 5	(NH ₄) ₂ RuCl ₆	AN90481C
S (Sulfur)	H ₂ O	1,000 ± 2	(NH ₄) ₂ SO ₄	AN90491H
Sb (Antimony)	10% HCl	1,000 ± 2	Sb	AN90501C
Sb (Antimony)	1% HF + 5% HNO ₃	1,000 ± 2	Sb	AN90501FN
Sc (Scandium)	2% HNO ₃	1,000 ± 2	Sc ₂ O ₃	AN90521N
Se (Selenium)	2% HNO ₃	1,000 ± 2	Se	AN90511N
Si (Silicon)	H ₂ O	1,000 ± 2	Na ₂ SiO ₃	AN90531H
Si (Silicon)	0.05% HF	1,000 ± 2	(NH ₄) ₂ SiF ₆	AN90531F
Sm (Samarium)	2% HNO ₃	1,000 ± 2	Sm ₂ O ₃	AN90541N
Sn (Tin)	10% HCl	1,000 ± 2	Sn	AN90551C
Sn (Tin)	1% HF + 5% HNO ₃	1,000 ± 2	Sn	AN90551FN
Sr (Strontium)	2% HCl	1,000 ± 2	SrCO ₃	AN90561C
Sr (Strontium)	2% HNO ₃	1,000 ± 2	SrCO ₃	AN90561N
Ta (Tantalum)	1% HF + 5% HNO ₃	1,000 ± 2	Ta	AN90571FN
Tb (Terbium)	2% HNO ₃	1,000 ± 2	Tb ₄ O ₇	AN90581N
Te (Tellurium)	20% HCl	1,000 ± 2	Te	AN90591C
Th (Thorium)	5% HNO ₃	1,000 ± 2	Th(NO ₃) ₄ ·5H ₂ O	AN90601N



1,000 mg/l Standards (continued)

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ti (Titanium)	1% HF + 5% HNO ₃	1,000 ± 2	Ti	AN90611FN
Tl (Thallium)	2% HNO ₃	1,000 ± 2	TlNO ₃	AN90621N
Tm (Thulium)	2% HNO ₃	1,000 ± 2	Tm ₂ O ₃	AN90631N
U (Uranium)	2% HNO ₃	1,000 ± 2	UO ₂ (NO ₃) ₂ ·6H ₂ O	AN90641N
V (Vanadium)	2% HNO ₃	1,000 ± 2	NH ₄ VO ₃	AN90651N
W (Tungsten)	2% NH ₄ OH	1,000 ± 2	(NH ₄) ₁₀ W ₁₂ O ₄₁ ·5H ₂ O	AN90661A
Y (Yttrium)	2% HNO ₃	1,000 ± 2	Y ₂ O ₃	AN90671N
Yb (Ytterbium)	2% HNO ₃	1,000 ± 2	Yb ₂ O ₃	AN90681N
Zn (Zinc)	2% HCl	1,000 ± 2	Zn	AN90691C
Zn (Zinc)	2% HNO ₃	1,000 ± 2	Zn	AN90691N
Zr (Zirconium)	1% HF + 5% HNO ₃	1,000 ± 2	Zr	AN90701FN
Br (Bromides)	H ₂ O	1,000 ± 2	KBr	AN90711H
Cl ⁻ (Chlorides)	H ₂ O	1,000 ± 2	KCl	AN90721H
F ⁻ (Fluorides)	H ₂ O	1,000 ± 2	NaF	AN90731H
I ⁻ (Iodides)	H ₂ O	1,000 ± 2	KI	AN90741H
NO ₂ ⁻ (Nitrites)	H ₂ O	1,000 ± 2	NaNO ₂	AN90751H
NO ₃ ⁻ (Nitrates)	H ₂ O	1,000 ± 2	NH ₄ NO ₃	AN90761H
PO ₄ ³⁻ (Phosphates)	H ₂ O	1,000 ± 2	NH ₄ H ₂ PO ₄	AN90771H
SO ₄ ²⁻ (Sulfates)	H ₂ O	1,000 ± 2	(NH ₄) ₂ SO ₄	AN90781H
Cr ⁶⁺ (Chromium VI)	H ₂ O	1,000 ± 2	K ₂ Cr ₂ O ₇	AN90791H
NH ₄ ⁺ (Ammonium)	H ₂ O	1,000 ± 2	NH ₄ Cl	AN90801H

10,000 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ag (Silver)	2% HNO ₃	10,000 ± 20	Ag	AN900110N
Al (Aluminium)	5% HCl	10,000 ± 20	Al	AN900210C
Al (Aluminium)	5% HNO ₃	10,000 ± 20	Al	AN900210N
As (Arsenic)	2% HNO ₃	10,000 ± 20	As	AN900310N
Au (Gold)	5% HCl	10,000 ± 20	Au	AN900410C
B (Boron)	2% NH ₄ OH	10,000 ± 20	H ₃ BO ₃	AN900510A
Ba (Barium)	5% HCl	10,000 ± 20	BaCO ₃	AN900610C
Ba (Barium)	2% HNO ₃	10,000 ± 20	BaCO ₃	AN900610N
Be (Beryllium)	2% HNO ₃	10,000 ± 20	Be	AN900710N
Bi (Bismuth)	5% HNO ₃	10,000 ± 20	Bi	AN900810N
Ca (Calcium)	5% HCl	10,000 ± 20	CaCO ₃	AN900910C
Ca (Calcium)	2% HNO ₃	10,000 ± 20	CaCO ₃	AN900910N
Cd (Cadmium)	5% HCl	10,000 ± 20	Cd	AN901010C
Cd (Cadmium)	2% HNO ₃	10,000 ± 20	Cd	AN901010N
Ce (Cerium)	5% HNO ₃	10,000 ± 20	Ce(NO ₃) ₃ ·6H ₂ O	AN901110N
Co (Cobalt)	5% HCl	10,000 ± 20	Co	AN901210C
Co (Cobalt)	2% HNO ₃	10,000 ± 20	Co	AN901210N
Cr (Chromium)	5% HCl	10,000 ± 20	Cr	AN901310C
Cr (Chromium)	2% HNO ₃	10,000 ± 20	Cr(NO ₃) ₃ ·9H ₂ O	AN901310N
Cs (Cesium)	H ₂ O	10,000 ± 20	CsCl	AN901410H
Cs (Cesium)	2% HNO ₃	10,000 ± 20	CsNO ₃	AN901410N
Cu (Copper)	2% HCl	10,000 ± 20	Cu	AN901510C
Cu (Copper)	2% HNO ₃	10,000 ± 20	Cu	AN901510N

10,000 mg/l Standards (continued)

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Dy (Dysprosium)	2% HNO ₃	10,000 ± 20	Dy ₂ O ₃	AN901610N
Er (Erbium)	2% HNO ₃	10,000 ± 20	Er ₂ O ₃	AN901710N
Eu (Europium)	2% HNO ₃	10,000 ± 20	Eu ₂ O ₃	AN901810N
Fe (Iron)	5% HCl	10,000 ± 20	Fe	AN901910C
Fe (Iron)	5% HNO ₃	10,000 ± 20	Fe	AN901910N
Ga (Gallium)	2% HNO ₃	10,000 ± 20	Ga	AN902010N
Gd (Gadolinium)	2% HNO ₃	10,000 ± 20	Gd ₂ O ₃	AN902110N
Ge (Germanium)	1% HF + 5% HNO ₃	10,000 ± 20	Ge	AN902210FN
Hf (Hafnium)	1% HF + 5% HNO ₃	10,000 ± 20	Hf	AN902310FN
Hg (Mercury)	5% HNO ₃	10,000 ± 20	Hg	AN902410N
Ho (Holmium)	2% HNO ₃	10,000 ± 20	Ho ₂ O ₃	AN902510N
In (Indium)	2% HNO ₃	10,000 ± 20	In	AN902610N
Ir (Iridium)	5% HCl	10,000 ± 50	(NH ₄) ₂ IrCl ₆	AN902710C
K (Potassium)	H ₂ O	10,000 ± 20	KCl	AN902810H
K (Potassium)	2% HNO ₃	10,000 ± 20	KNO ₃	AN902810N
La (Lanthanum)	2% HNO ₃	10,000 ± 20	La ₂ O ₃	AN902910N
Li (Lithium)	5% HCl	10,000 ± 20	Li ₂ CO ₃	AN903010C
Li (Lithium)	2% HNO ₃	10,000 ± 20	Li ₂ CO ₃	AN903010N
Lu (Lutetium)	2% HNO ₃	10,000 ± 20	Lu ₂ O ₃	AN903110N
Mg (Magnesium)	5% HCl	10,000 ± 20	Mg	AN903210C
Mg (Magnesium)	2% HNO ₃	10,000 ± 20	Mg	AN903210N
Mn (Manganese)	5% HCl	10,000 ± 20	Mn	AN903310C
Mn (Manganese)	2% HNO ₃	10,000 ± 20	Mn	AN903310N
Mo (Molybdenum)	2% NH ₄ OH	10,000 ± 20	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	AN903410A
Na (Sodium)	H ₂ O	10,000 ± 20	NaCl	AN903510H
Na (Sodium)	2% HNO ₃	10,000 ± 20	NaNO ₃	AN903510N
Nb (Niobium)	1% HF + 5% HNO ₃	10,000 ± 20	Nb	AN903610FN
Nd (Neodymium)	2% HNO ₃	10,000 ± 20	Nd ₂ O ₃	AN903710N
Ni (Nickel)	5% HCl	10,000 ± 20	Ni	AN903810C
Ni (Nickel)	2% HNO ₃	10,000 ± 20	Ni	AN903810N
Os (Osmium)	5% HCl	10,000 ± 50	(NH ₄) ₂ OsCl ₆	AN903910C
P (Phosphorus)	0.05% H ₂ SO ₄	10,000 ± 20	NH ₄ H ₂ PO ₄	AN904010S
Pb (Lead)	2% HNO ₃	10,000 ± 20	Pb	AN904110N
Pd (Palladium)	5% HCl	10,000 ± 20	Pd	AN904210C
Pr (Praseodymium)	2% HNO ₃	10,000 ± 20	Pr ₆ O ₁₁	AN904310N
Pt (Platinum)	5% HCl	10,000 ± 20	Pt	AN904410C
Rb (Rubidium)	H ₂ O	10,000 ± 20	RbCl	AN904510H
Rb (Rubidium)	2% HNO ₃	10,000 ± 20	RbNO ₃	AN904510N
Re (Rhenium)	H ₂ O	10,000 ± 20	NH ₄ ReO ₄	AN904610H
Rh (Rhodium)	5% HCl	10,000 ± 50	(NH ₄) ₃ RhCl ₆	AN904710C
Ru (Ruthenium)	5% HCl	10,000 ± 50	(NH ₄) ₂ RuCl ₆	AN904810C
S (Sulfur)	H ₂ O	10,000 ± 20	(NH ₄) ₂ SO ₄	AN904910H
Sb (Antimony)	10% HCl	10,000 ± 20	Sb	AN905010C
Sb (Antimony)	1% HF + 5% HNO ₃	10,000 ± 20	Sb	AN905010FN
Sc (Scandium)	2% HNO ₃	10,000 ± 20	Sc ₂ O ₃	AN905210N
Se (Selenium)	2% HNO ₃	10,000 ± 20	Se	AN905110N
Si (Silicon)	H ₂ O	10,000 ± 20	Na ₂ SiO ₃	AN905310H
Si (Silicon)	0.05% HF	10,000 ± 20	(NH ₄) ₂ SiF ₆	AN905310F
Sm (Samarium)	2% HNO ₃	10,000 ± 20	Sm ₂ O ₃	AN905410N



10,000 mg/l Standards (continued)

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Sn (Tin)	20% HCl	10,000 ± 20	Sn	AN905510C
Sn (Tin)	1% HF + 5% HNO ₃	10,000 ± 20	Sn	AN905510FN
Sr (Strontium)	5% HCl	10,000 ± 20	SrCO ₃	AN905610C
Sr (Strontium)	2% HNO ₃	10,000 ± 20	SrCO ₃	AN905610N
Ta (Tantalum)	1% HF + 5% HNO ₃	10,000 ± 20	Ta	AN905710FN
Tb (Terbium)	2% HNO ₃	10,000 ± 20	Tb ₄ O ₇	AN905810N
Te (Tellurium)	20% HCl	10,000 ± 20	Te	AN905910C
Th (Thorium)	5% HNO ₃	10,000 ± 20	Th(NO ₃) ₄ ·5H ₂ O	AN906010N
Ti (Titanium)	1% HF + 5% HNO ₃	10,000 ± 20	Ti	AN906110FN
Tl (Thallium)	2% HNO ₃	10,000 ± 20	TlNO ₃	AN906210N
Tm (Thulium)	2% HNO ₃	10,000 ± 20	Tm ₂ O ₃	AN906310N
V (Vanadium)	2% HNO ₃	10,000 ± 20	NH ₄ VO ₃	AN906510N
W (Tungsten)	2% NH ₄ OH	10,000 ± 20	(NH ₄) ₁₀ W ₁₂ O ₄₁ ·5H ₂ O	AN906610A
Y (Yttrium)	2% HNO ₃	10,000 ± 20	Y ₂ O ₃	AN906710N
Yb (Ytterbium)	2% HNO ₃	10,000 ± 20	Yb ₂ O ₃	AN906810N
Zn (Zinc)	5% HCl	10,000 ± 20	Zn	AN906910C
Zn (Zinc)	2% HNO ₃	10,000 ± 20	Zn	AN906910N
Zr (Zirconium)	1% HF + 5% HNO ₃	10,000 ± 20	Zr	AN907010FN
Br (Bromides)	H ₂ O	10,000 ± 20	KBr	AN907110H
Cl ⁻ (Chlorides)	H ₂ O	10,000 ± 20	KCl	AN907210H
F ⁻ (Fluorides)	H ₂ O	10,000 ± 20	NaF	AN907310H
I ⁻ (Iodides)	H ₂ O	10,000 ± 20	KI	AN907410H
NO ₂ ⁻ (Nitrites)	H ₂ O	10,000 ± 20	NaNO ₂	AN907510H
NO ₃ ⁻ (Nitrates)	H ₂ O	10,000 ± 20	NH ₄ NO ₃	AN907610H
PO ₄ ³⁻ (Phosphates)	H ₂ O	10,000 ± 20	NH ₄ H ₂ PO ₄	AN907710H
SO ₄ ²⁻ (Sulfates)	H ₂ O	10,000 ± 20	(NH ₄) ₂ SO ₄	AN907810H
Cr ⁶⁺ (Chromium VI)	H ₂ O	10,000 ± 20	K ₂ Cr ₂ O ₇	AN907910H
NH ₄ ⁺ (Ammonium)	H ₂ O	10,000 ± 20	NH ₄ Cl	AN908010H

100 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ag (Silver)	2% HNO ₃	100.0 ± 0.2	Ag	AN8001N
Al (Aluminium)	5% HCl	100.0 ± 0.2	Al	AN8002C
Al (Aluminium)	5% HNO ₃	100.0 ± 0.2	Al	AN8002N
As (Arsenic)	2% HNO ₃	100.0 ± 0.2	As	AN8003N
Au (Gold)	5% HCl	100.0 ± 0.2	Au	AN8004C
B (Boron)	H ₂ O	100.0 ± 0.2	H ₃ BO ₃	AN8005H
Ba (Barium)	2% HCl	100.0 ± 0.2	BaCO ₃	AN8006C
Ba (Barium)	2% HNO ₃	100.0 ± 0.2	BaCO ₃	AN8006N
Be (Beryllium)	2% HNO ₃	100.0 ± 0.2	Be	AN8007N
Bi (Bismuth)	5% HNO ₃	100.0 ± 0.2	Bi	AN8008N
Ca (Calcium)	2% HCl	100.0 ± 0.2	CaCO ₃	AN8009C
Ca (Calcium)	2% HNO ₃	100.0 ± 0.2	CaCO ₃	AN8009N
Cd (Cadmium)	2% HCl	100.0 ± 0.2	Cd	AN8010C
Cd (Cadmium)	2% HNO ₃	100.0 ± 0.2	Cd	AN8010N
Ce (Cerium)	5% HNO ₃	100.0 ± 0.2	Ce(NO ₃) ₃ ·6H ₂ O	AN8011N
Co (Cobalt)	2% HCl	100.0 ± 0.2	Co	AN8012C

100 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Co (Cobalt)	2% HNO ₃	100.0 ± 0.2	Co	AN8012N
Cr (Chromium)	2% HCl	100.0 ± 0.2	Cr	AN8013C
Cr (Chromium)	2% HNO ₃	100.0 ± 0.2	Cr(NO ₃) ₃ ·9H ₂ O	AN8013N
Cs (Cesium)	H ₂ O	100.0 ± 0.2	CsCl	AN8014H
Cs (Cesium)	2% HNO ₃	100.0 ± 0.2	CsNO ₃	AN8014N
Cu (Copper)	2% HCl	100.0 ± 0.2	Cu	AN8015C
Cu (Copper)	2% HNO ₃	100.0 ± 0.2	Cu	AN8015N
Dy (Dysprosium)	2% HNO ₃	100.0 ± 0.2	Dy ₂ O ₃	AN8016N
Er (Erbium)	2% HNO ₃	100.0 ± 0.2	Er ₂ O ₃	AN8017N
Eu (Europium)	2% HNO ₃	100.0 ± 0.2	Eu ₂ O ₃	AN8018N
Fe (Iron)	5% HCl	100.0 ± 0.2	Fe	AN8019C
Fe (Iron)	2% HNO ₃	100.0 ± 0.2	Fe	AN8019N
Ga (Gallium)	2% HNO ₃	100.0 ± 0.2	Ga	AN8020N
Gd (Gadolinium)	2% HNO ₃	100.0 ± 0.2	Gd ₂ O ₃	AN8021N
Ge (Germanium)	1% HF + 5% HNO ₃	100.0 ± 0.2	Ge	AN8022FN
Hf (Hafnium)	1% HF + 5% HNO ₃	100.0 ± 0.2	Hf	AN8023FN
Hg (Mercury)	5% HNO ₃	100.0 ± 0.2	Hg	AN8024N
Ho (Holmium)	2% HNO ₃	100.0 ± 0.2	Ho ₂ O ₃	AN8025N
In (Indium)	2% HNO ₃	100.0 ± 0.2	In	AN8026N
Ir (Iridium)	5% HCl	100.0 ± 0.5	(NH ₄) ₂ IrCl ₆	AN8027C
K (Potassium)	H ₂ O	100.0 ± 0.2	KCl	AN8028H
K (Potassium)	2% HNO ₃	100.0 ± 0.2	KNO ₃	AN8028N
La (Lanthanum)	2% HNO ₃	100.0 ± 0.2	La ₂ O ₃	AN8029N
Li (Lithium)	2% HCl	100.0 ± 0.2	Li ₂ CO ₃	AN8030C
Li (Lithium)	2% HNO ₃	100.0 ± 0.2	Li ₂ CO ₃	AN8030N
Lu (Lutetium)	2% HNO ₃	100.0 ± 0.2	Lu ₂ O ₃	AN8031N
Mg (Magnesium)	2% HCl	100.0 ± 0.2	Mg	AN8032C
Mg (Magnesium)	2% HNO ₃	100.0 ± 0.2	Mg	AN8032N
Mn (Manganese)	2% HCl	100.0 ± 0.2	Mn	AN8033C
Mn (Manganese)	2% HNO ₃	100.0 ± 0.2	Mn	AN8033N
Mo (Molybdenum)	2% NH ₄ OH	100.0 ± 0.2	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	AN8034A
Na (Sodium)	H ₂ O	100.0 ± 0.2	NaCl	AN8035H
Na (Sodium)	2% HNO ₃	100.0 ± 0.2	NaNO ₃	AN8035N
Nb (Niobium)	1% HF + 5% HNO ₃	100.0 ± 0.2	Nb	AN8036FN
Nd (Neodymium)	2% HNO ₃	100.0 ± 0.2	Nd ₂ O ₃	AN8037N
Ni (Nickel)	2% HCl	100.0 ± 0.2	Ni	AN8038C
Ni (Nickel)	2% HNO ₃	100.0 ± 0.2	Ni	AN8038N
Os (Osmium)	5% HCl	100.0 ± 0.5	(NH ₄) ₂ OsCl ₆	AN8039C
P (Phosphorus)	0.05% H ₂ SO ₄	100.0 ± 0.2	NH ₄ H ₂ PO ₄	AN8040S
Pb (Lead)	2% HNO ₃	100.0 ± 0.2	Pb	AN8041N
Pd (Palladium)	5% HCl	100.0 ± 0.2	Pd	AN8042C
Pr (Praseodymium)	2% HNO ₃	100.0 ± 0.2	Pr ₆ O ₁₁	AN8043N
Pt (Platinum)	5% HCl	100.0 ± 0.2	Pt	AN8044C
Rb (Rubidium)	H ₂ O	100.0 ± 0.2	RbCl	AN8045H
Rb (Rubidium)	2% HNO ₃	100.0 ± 0.2	RbNO ₃	AN8045N
Re (Rhenium)	H ₂ O	100.0 ± 0.2	NH ₄ ReO ₄	AN8046H
Rh (Rhodium)	5% HCl	100.0 ± 0.5	(NH ₄) ₃ RhCl ₆	AN8047C
Ru (Ruthenium)	5% HCl	100.0 ± 0.5	(NH ₄) ₂ RuCl ₆	AN8048C
S (Sulfur)	H ₂ O	100.0 ± 0.2	(NH ₄) ₂ SO ₄	AN8049H



100 mg/l Standards (continued)

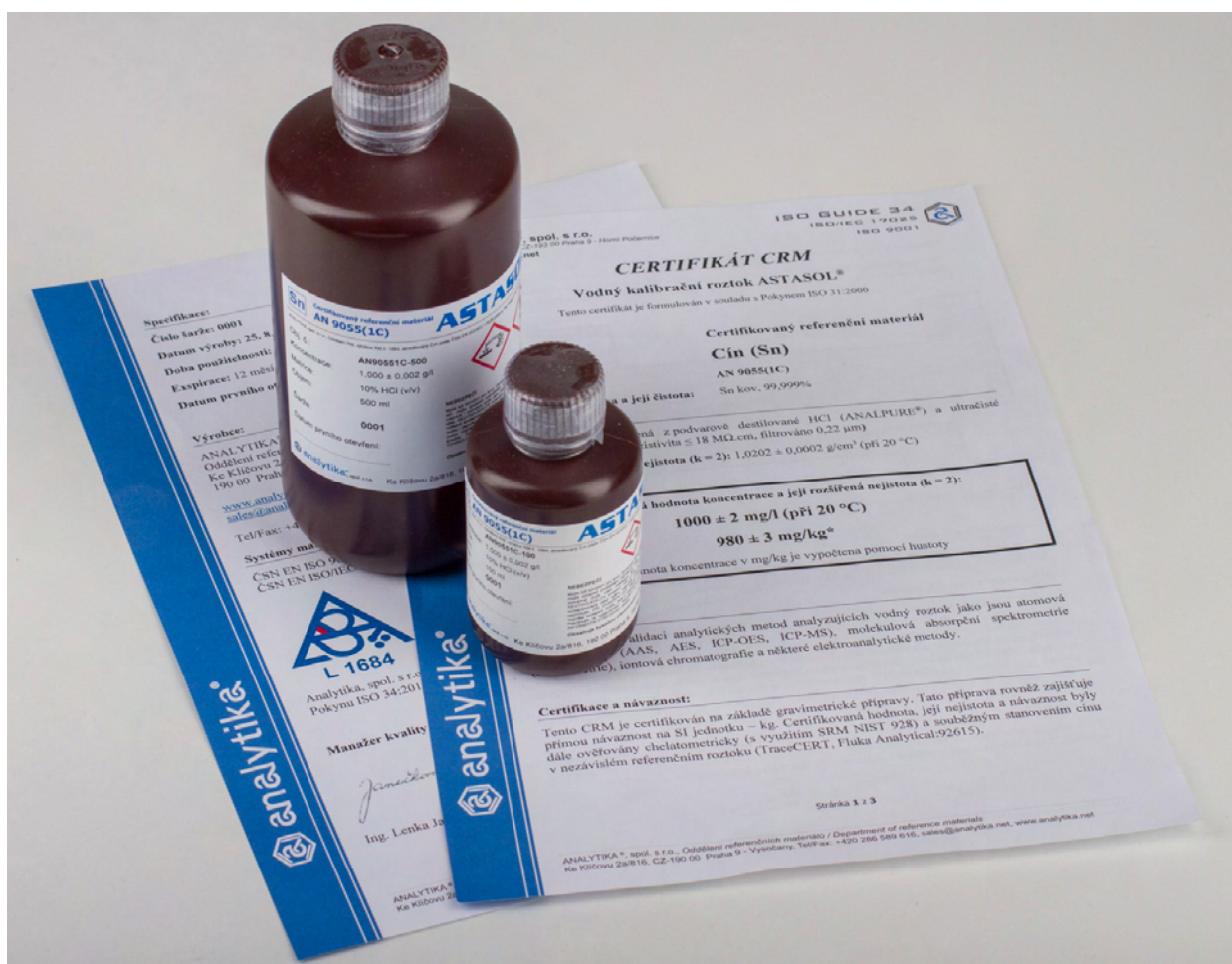
Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Sb (Antimony)	10% HCl	100.0 ± 0.2	Sb	AN8050C
Sb (Antimony)	1% HF + 5% HNO ₃	100.0 ± 0.2	Sb	AN8050FN
Sc (Scandium)	2% HNO ₃	100.0 ± 0.2	Sc ₂ O ₃	AN8052N
Se (Selenium)	2% HNO ₃	100.0 ± 0.2	Se	AN8051N
Si (Silicon)	H ₂ O	100.0 ± 0.2	Na ₂ SiO ₃	AN8053H
Si (Silicon)	0.05% HF	100.0 ± 0.2	(NH ₄) ₂ SiF ₆	AN8053F
Sm (Samarium)	2% HNO ₃	100.0 ± 0.2	Sm ₂ O ₃	AN8054N
Sn (Tin)	10% HCl	100.0 ± 0.2	Sn	AN8055C
Sn (Tin)	1% HF + 5% HNO ₃	100.0 ± 0.2	Sn	AN8055FN
Sr (Strontium)	2% HCl	100.0 ± 0.2	SrCO ₃	AN8056C
Sr (Strontium)	2% HNO ₃	100.0 ± 0.2	SrCO ₃	AN8056N
Ta (Tantalum)	1% HF + 5% HNO ₃	100.0 ± 0.2	Ta	AN8057FN
Tb (Terbium)	2% HNO ₃	100.0 ± 0.2	Tb ₄ O ₇	AN8058N
Te (Tellurium)	20% HCl	100.0 ± 0.2	Te	AN8059C
Th (Thorium)	5% HNO ₃	100.0 ± 0.2	Th(NO ₃) ₄ ·5H ₂ O	AN8060N
Ti (Titanium)	1% HF + 5% HNO ₃	100.0 ± 0.2	Ti	AN8061FN
Tl (Thallium)	2% HNO ₃	100.0 ± 0.2	TlNO ₃	AN8062N
Tm (Thulium)	2% HNO ₃	100.0 ± 0.2	Tm ₂ O ₃	AN8063N
U (Uranium)	2% HNO ₃	100.0 ± 0.2	UO ₂ (NO ₃) ₂ ·6H ₂ O	AN8064N
V (Vanadium)	2% HNO ₃	100.0 ± 0.2	NH ₄ VO ₃	AN8065N
W (Tungsten)	2% NH ₄ OH	100.0 ± 0.2	(NH ₄) ₁₀ W ₁₂ O ₄₁ ·5H ₂ O	AN8066A
Y (Yttrium)	2% HNO ₃	100.0 ± 0.2	Y ₂ O ₃	AN8067N
Yb (Ytterbium)	2% HNO ₃	100.0 ± 0.2	Yb ₂ O ₃	AN8068N
Zn (Zinc)	2% HCl	100.0 ± 0.2	Zn	AN8069C
Zn (Zinc)	2% HNO ₃	100.0 ± 0.2	Zn	AN8069N
Zr (Zirconium)	1% HF + 5% HNO ₃	100.0 ± 0.2	Zr	AN8070FN
Br (Bromides)	H ₂ O	100.0 ± 0.2	KBr	AN8071H
Cl ⁻ (Chlorides)	H ₂ O	100.0 ± 0.2	KCl	AN8072H
F ⁻ (Fluorides)	H ₂ O	100.0 ± 0.2	NaF	AN8073H
I ⁻ (Iodides)	H ₂ O	100.0 ± 0.2	KI	AN8074H
NO ₂ ⁻ (Nitrites)	H ₂ O	100.0 ± 0.2	NaNO ₂	AN8075H
NO ₃ ⁻ (Nitrates)	H ₂ O	100.0 ± 0.2	NH ₄ NO ₃	AN8076H
PO ₄ ³⁻ (Phosphates)	H ₂ O	100.0 ± 0.2	NH ₄ H ₂ PO ₄	AN8077H
SO ₄ ²⁻ (Sulfates)	H ₂ O	100.0 ± 0.2	(NH ₄) ₂ SO ₄	AN8078H
Cr ⁶⁺ (Chromium VI)	H ₂ O	100.0 ± 0.2	K ₂ Cr ₂ O ₇	AN8079H
NH ₄ ⁺ (Ammonium)	H ₂ O	100.0 ± 0.2	NH ₄ Cl	AN8080H

10 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ag (Silver)	2% HNO ₃	10.00 ± 0.05	Ag	AN7001N
Al (Aluminium)	5% HNO ₃	10.00 ± 0.05	Al	AN7002N
As (Arsenic)	2% HNO ₃	10.00 ± 0.05	As	AN7003N
Au (Gold)	5% HCl	10.00 ± 0.05	Au	AN7004C
B (Boron)	H ₂ O	10.00 ± 0.05	H ₃ BO ₃	AN7005H
Ba (Barium)	2% HNO ₃	10.00 ± 0.05	BaCO ₃	AN7006N
Be (Beryllium)	2% HNO ₃	10.00 ± 0.05	Be	AN7007N
Bi (Bismuth)	5% HNO ₃	10.00 ± 0.05	Bi	AN7008N
Ca (Calcium)	2% HNO ₃	10.00 ± 0.05	CaCO ₃	AN7009N
Cd (Cadmium)	2% HNO ₃	10.00 ± 0.05	Cd	AN7010N
Ce (Cerium)	5% HNO ₃	10.00 ± 0.05	Ce(NO ₃) ₃ ·6H ₂ O	AN7011N
Co (Cobalt)	2% HNO ₃	10.00 ± 0.05	Co	AN7012N
Cr (Chromium)	2% HNO ₃	10.00 ± 0.05	Cr(NO ₃) ₃ ·9H ₂ O	AN7013N
Cs (Cesium)	2% HNO ₃	10.00 ± 0.05	CsNO ₃	AN7014N
Cu (Copper)	2% HNO ₃	10.00 ± 0.05	Cu	AN7015N
Dy (Dysprosium)	2% HNO ₃	10.00 ± 0.05	Dy ₂ O ₃	AN7016N
Er (Erbium)	2% HNO ₃	10.00 ± 0.05	Er ₂ O ₃	AN7017N
Eu (Europium)	2% HNO ₃	10.00 ± 0.05	Eu ₂ O ₃	AN7018N
Fe (Iron)	2% HNO ₃	10.00 ± 0.05	Fe	AN7019N
Ga (Gallium)	2% HNO ₃	10.00 ± 0.05	Ga	AN7020N
Gd (Gadolinium)	2% HNO ₃	10.00 ± 0.05	Gd ₂ O ₃	AN7021N
Ge (Germanium)	1% HF + 5% HNO ₃	10.00 ± 0.05	Ge	AN7022FN
Hf (Hafnium)	1% HF + 5% HNO ₃	10.00 ± 0.05	Hf	AN7023FN
Hg (Mercury)	5% HNO ₃	10.00 ± 0.05	Hg	AN7024N
Ho (Holmium)	2% HNO ₃	10.00 ± 0.05	Ho ₂ O ₃	AN7025N
In (Indium)	2% HNO ₃	10.00 ± 0.05	In	AN7026N
K (Potassium)	2% HNO ₃	10.00 ± 0.05	KNO ₃	AN7028N
La (Lanthanum)	2% HNO ₃	10.00 ± 0.05	La ₂ O ₃	AN7029N
Li (Lithium)	2% HNO ₃	10.00 ± 0.05	Li ₂ CO ₃	AN7030N
Lu (Lutetium)	2% HNO ₃	10.00 ± 0.05	Lu ₂ O ₃	AN7031N
Mg (Magnesium)	2% HNO ₃	10.00 ± 0.05	Mg	AN7032N
Mn (Manganese)	2% HNO ₃	10.00 ± 0.05	Mn	AN7033N
Mo (Molybdenum)	H ₂ O + tr. NH ₄ OH	10.00 ± 0.05	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	AN7034A
Na (Sodium)	2% HNO ₃	10.00 ± 0.05	NaNO ₃	AN7035N
Nb (Niobium)	1% HF + 5% HNO ₃	10.00 ± 0.05	Nb	AN7036FN
Nd (Neodymium)	2% HNO ₃	10.00 ± 0.05	Nd ₂ O ₃	AN7037N
Ni (Nickel)	2% HNO ₃	10.00 ± 0.05	Ni	AN7038N
P (Phosphorus)	0.05% H ₂ SO ₄	10.00 ± 0.05	NH ₄ H ₂ PO ₄	AN7040S
Pb (Lead)	2% HNO ₃	10.00 ± 0.05	Pb	AN7041N
Pd (Palladium)	5% HCl	10.00 ± 0.05	Pd	AN7042C
Pr (Praseodymium)	2% HNO ₃	10.00 ± 0.05	Pr ₆ O ₁₁	AN7043N
Pt (Platinum)	5% HCl	10.00 ± 0.05	Pt	AN7044C
Rb (Rubidium)	2% HNO ₃	10.00 ± 0.05	RbNO ₃	AN7045N
Re (Rhenium)	2% HNO ₃	10.00 ± 0.05	NH ₄ ReO ₄	AN7046H
Rh (Rhodium)	5% HCl	10.0 ± 0.1	(NH ₄) ₃ RhCl ₆	AN7047C
Ru (Ruthenium)	5% HCl	10.0 ± 0.1	(NH ₄) ₂ RuCl ₆	AN7048C
S (Sulfur)	H ₂ O	10.00 ± 0.05	(NH ₄) ₂ SO ₄	AN7049H
Sb (Antimony)	1% HF + 5% HNO ₃	10.00 ± 0.05	Sb	AN7050FN
Sc (Scandium)	2% HNO ₃	10.00 ± 0.05	Sc ₂ O ₃	AN7052N

10 mg/l Standards (continued)

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Se (Selenium)	2% HNO ₃	10.00 ± 0.05	Se	AN7051N
Si (Silicon)	0.05% HF	10.00 ± 0.05	(NH ₄) ₂ SiF ₆	AN7053F
Sm (Samarium)	2% HNO ₃	10.00 ± 0.05	Sm ₂ O ₃	AN7054N
Sn (Tin)	1% HF + 5% HNO ₃	10.00 ± 0.05	Sn	AN7055FN
Sr (Strontium)	2% HNO ₃	10.00 ± 0.05	SrCO ₃	AN7056N
Ta (Tantalum)	1% HF + 5% HNO ₃	10.00 ± 0.05	Ta	AN7057FN
Tb (Terbium)	2% HNO ₃	10.00 ± 0.05	Tb ₄ O ₇	AN7058N
Te (Tellurium)	20% HCl	10.00 ± 0.05	Te	AN7059C
Th (Thorium)	5% HNO ₃	10.00 ± 0.05	Th(NO ₃) ₄ ·5H ₂ O	AN7060N
Ti (Titanium)	1% HF + 5% HNO ₃	10.00 ± 0.05	Ti	AN7061FN
Tl (Thallium)	2% HNO ₃	10.00 ± 0.05	TlNO ₃	AN7062N
Tm (Thulium)	2% HNO ₃	10.00 ± 0.05	Tm ₂ O ₃	AN7063N
U (Uranium)	2% HNO ₃	10.00 ± 0.05	UO ₂ (NO ₃) ₂ ·6H ₂ O	AN7064N
V (Vanadium)	2% HNO ₃	10.00 ± 0.05	NH ₄ VO ₃	AN7065N
W (Tungsten)	H ₂ O + tr. NH ₄ OH	10.00 ± 0.05	(NH ₄) ₁₀ W ₁₂ O ₄₁ ·5H ₂ O	AN7066A
Y (Yttrium)	2% HNO ₃	10.00 ± 0.05	Y ₂ O ₃	AN7067N
Yb (Ytterbium)	2% HNO ₃	10.00 ± 0.05	Yb ₂ O ₃	AN7068N
Zn (Zinc)	2% HNO ₃	10.00 ± 0.05	Zn	AN7069N
Zr (Zirconium)	1% HF + 5% HNO ₃	10.00 ± 0.05	Zr	AN7070FN



Multi-element standards ASTASOL®

- » For calibration and validation of analytical methods analysing aqueous solutions such as atomic spectrometry (AAS, AES, ICP-OES, ICP-MS), molecular absorption spectrometry (colorimetry) and selected electroanalytical methods
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Directly traceable to SI units
- » Controlled with primary or instrumental analytical methods and independent standards (e.g. NIST SRM)
- » Prepared from high purity starting material, sub boil distilled acids and ultrapure demineralized water (resistivity ~ 18MΩ.cm)
- » Delivered in amber HDPE or glass laboratory grade bottles
- » Expiration time 12 months, wherever possible
- » Supplied with the Certificate designed in accordance with ISO Guide 31
- » Available in volumes 30 ml, 50 ml, 100 ml, 250 ml and 500 ml

AN9081MC

Matrix: 2% HCl (v/v)

Analytes	Concentration (mg/l)
K, Li, Na	1,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9082MN

Earth alkali metals

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ba, Ca, Mg, Sr	1,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9083MC

Blood serum matrix

Matrix: 1% HCl (v/v)

Analytes	Concentration (mg/l)
Ca	100
K	150
Mg	20
Na	3,300

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9084MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Co, Cr, Cu, Fe, Mn, Ni, V	500

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															



AN9085MCN

Toxic elements calibration solution

Matrix: 5% aqua regia (v/v)

Analytes	Concentration (mg/l)
Pb, V	200
Cr, Ni, Zn	100
Co, Cu	50
As	25
Be, Mo	10
Cd, Hg	2

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9086MN

Recommended for the evaluation of the waste leaches

Matrix: 10% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Pb	200
Al, Tl	100
Co, Ni, V, Zn	50
B, Cd, Cr, Cu, Fe	20
Mn	10
Ba, Se	5
Be	2

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9087MC

Matrix: 20% HCl (v/v)

Analytes	Concentration (mg/l)
Au, Ir, Os, Pd, Pt, Rh, Ru	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9088MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ce, La, Nd, Pr	100
Dy, Er, Eu, Gd, Ho, Lu, Sc, Sm, Tb, Tm, Y, Yb	20

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9089MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Cd, Co, Cr, Cu, Mn, Ni, Pb, V, Zn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9090MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Se, Sr, Ti, Tl, V, Zn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U													

AN9091MN

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca, K, Mg, Na	1,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U													

AN9092MN

Matrix: 10% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Al, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Zn	1,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U													

AN9093MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Al, Ba, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Na, Ni, Pb, Ti, Zn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U													

AN9094MFN

Matrix: 0.2% HF + 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, Be, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, P, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U													

AN9095MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Al, Be, Bi, Cd, Co, Cu, Fe, Li, Mn, Mo, Ni, Pb, Si, Sr, V, W, Zn, Zr	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U													

Recommended for use in water analysis according to EN ISO 11885
The concentrate to be diluted 10x



AN9096MN

Recommended for use in water analysis according to EN ISO 11885
The concentrate to be diluted 10x

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, Sb, Se, Sn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9097MN

Recommended for use in water analysis according to EN ISO 11885
The concentrate to be diluted 10x

Matrix: 1% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca, K, Mg, Na, P, S	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9098MN

Recommended for EPA method No. 200.7 and 600/482-055

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, Be, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Mo, Ni, Pb, Sb, Se, Ti, Tl, V, Zn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9099MN

Recommended for EPA method No. 200.7 and 600/482-055

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ag, Hg	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9104MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca	1,000
As, B, Be, Fe, Se, Zn	100
Ag, Al, Ba, Bi, Cd, Co, Cr, Cu, Ga, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Rb, Sr, Te, Ti, U, V	10

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9108MN

Multi-element standard for GFAA

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Al, As, Pb, Sb, Se, Tl	100
Ba, Co, Cu, Ni	50
Cr, Fe, Mn	20
Ag	10
Be, Cd	5

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9109MN

Multi-element standard for GFAA

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ni	10
Cr	3

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9110MN

Calibration standard of trace metals

Matrix: 5% HNO₃ + tr. HF(v/v)

Analytes	Concentration (mg/l)
Al	500
V	250
As, Be, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn	100
Cd, Se	25
Hg	5

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9111MC

Wavelength calibration standard

Matrix: 2% HCl (v/v)

Analytes	Concentration (mg/l)
K, P, S	100
As, La, Li, Mn, Mo, Na, Ni, Sc	20

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9112MN

Calibration mix, 4 majors

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca, K, Mg, Na	5,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															



AN9113MN

Calibration mix, 5 majors

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca, Fe, K, Mg, Na	500

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9114MN

Quality control solution

Matrix: 10% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ag, Al, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Sr, Ti, Zn	1,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9115MN

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th, Tm, U, Y, Yb	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9116MFN

Calibration mix for AA and ICP-OES

Matrix: 2% HNO₃ + 0.5% HF (v/v)

Analytes	Concentration (mg/l)
Mo, Sn, Sb, Ti	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9117MN

ICP calibration standard

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Se, Sr, Ti, U, V, Zn	10

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9118MN

Tuning standard

Matrix: 1% HNO₃ (v/v)

Analytes	Concentration (mg/l)
K	500
Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn	50

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
Th	Pa	U															

AN9119MN

Toxic elements calibration solution

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, Be, Cd, Ni, Pb, Se, Tl	100

H																	He																		
Li	Be											B	C	N	O	F	Ne																		
Na	Mg											Al	Si	P	S	Cl	Ar																		
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi																					
																		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
																		Th	Pa	U															

AN9120MC

Oral dose - precious metals elemental impurities acc USP 232

Matrix: 10% HCl (v/v)

Analytes	Concentration (mg/l)
Ir, Os, Pd, Pt, Rh, Ru	100

H																	He																		
Li	Be											B	C	N	O	F	Ne																		
Na	Mg											Al	Si	P	S	Cl	Ar																		
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi																					
																		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
																		Th	Pa	U															

AN9121MC

Parenteral dose - precious metals elemental impurities acc USP 232

Matrix: 10% HCl (v/v)

Analytes	Concentration (mg/l)
Ir, Os, Pd, Pt, Rh, Ru	10

H																	He																		
Li	Be											B	C	N	O	F	Ne																		
Na	Mg											Al	Si	P	S	Cl	Ar																		
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi																					
																		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
																		Th	Pa	U															

AN9122MN

Oral dose - elemental impurities acc. USP 232

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Cu	1,000
Ni	500
Mo, V	100
Cd	25
Hg	15
Pb	5
As	1.5

H																	He																		
Li	Be											B	C	N	O	F	Ne																		
Na	Mg											Al	Si	P	S	Cl	Ar																		
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi																					
																		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
																		Th	Pa	U															

AN9123MN

Parenteral dose - elemental impurities acc. USP 232

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Cu	100
Ni	50
Mo, V	10
Pb	5
Cd	2.5
As, Hg	1.5

H																	He																		
Li	Be											B	C	N	O	F	Ne																		
Na	Mg											Al	Si	P	S	Cl	Ar																		
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi																					
																		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
																		Th	Pa	U															

AN9124MN

Dietary supplements impurities acc. USP 2322

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, Hg	15
Pb	10
Cd	5

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U											

AN9125MN

ICP calibration standard

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se, Th, Tl, U, V, Zn	100

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U											

AN9126MN

Interference check standard

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca	6,000
Fe	5,000
Mg	3,000
Al	1,200
Na	1,000

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi			

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U											



REFERENCE MATERIALS

Single element standards ASTASOL®

- » Economical solution for routine calibration of analytical methods analysing aqueous solutions such as atomic spectrometry (AAS,AES, ICP-OES, ICP-MS), molecular absorption spectrometry (colorimetry) and selected electroanalytical methods
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Traceable to corresponding CRM ASTASOL®
- » Available in concentrations 1,000 mg/l and 10,000 mg/l
- » Prepared from high purity starting material, sub boil distilled acids and ultrapure demineralized water (resistivity ~ 18MΩ.cm)
- » Delivered in amber HDPE or glass laboratory grade bottles
- » Expiration time 18 months, wherever possible
- » Supplied with the Identification sheet designed in accordance with ISO Guide 31
- » Available in volumes 100 ml, 250 ml and 500 ml

1,000 mg/l Standards

Analyte	Matrix	Concentration (mg/l)	Starting material	Product code
Ag (Silver)	2% HNO ₃	1,000 ± 5	Ag	ANS001
Al (Aluminium)	5% HCl	1,000 ± 5	Al	ANS002
Al (Aluminium)	5% HNO ₃	1,000 ± 5	Al	ANS002N
As (Arsenic)	2% HNO ₃	1,000 ± 5	As	ANS003
B (Boron)	H ₂ O	1,000 ± 5	H ₃ BO ₃	ANS005
Ba (Barium)	2% HNO ₃	1,000 ± 5	BaCO ₃	ANS006
Bi (Bismuth)	5% HNO ₃	1,000 ± 5	Bi	ANS008
Ca (Calcium)	2% HNO ₃	1,000 ± 5	CaCO ₃	ANS009
Cd (Cadmium)	2% HNO ₃	1,000 ± 5	Cd	ANS010
Co (Cobalt)	2% HNO ₃	1,000 ± 5	Co	ANS012
Cr (Chromium)	2% HNO ₃	1,000 ± 5	Cr(NO ₃) ₃ ·9H ₂ O	ANS013
Cu (Copper)	2% HNO ₃	1,000 ± 5	Cu	ANS015
Fe (Iron)	2% HNO ₃	1,000 ± 5	Fe	ANS019
Hg (Mercury)	5% HNO ₃	1,000 ± 5	Hg	ANS024
K (Potassium)	H ₂ O	1,000 ± 5	KNO ₃	ANS028
Li (Lithium)	2% HNO ₃	1,000 ± 5	Li ₂ CO ₃	ANS030
Mg (Magnesium)	2% HNO ₃	1,000 ± 5	Mg	ANS032
Mn (Manganese)	2% HNO ₃	1,000 ± 5	Mn	ANS033
Mo (Molybdenum)	2% NH ₄ OH	1,000 ± 5	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	ANS034
Na (Sodium)	H ₂ O	1,000 ± 5	NaNO ₃	ANS035
Ni (Nickel)	2% HNO ₃	1,000 ± 5	Ni	ANS038
P (Phosphorus)	0.05% H ₂ SO ₄	1,000 ± 5	NH ₄ H ₂ PO ₄	ANS040
Pb (Lead)	2% HNO ₃	1,000 ± 5	Pb	ANS041
Sb (Antimony)	10% HCl	1,000 ± 5	Sb	ANS050
Se (Selenium)	2% HNO ₃	1,000 ± 5	Se	ANS051
Si (Silicon)	H ₂ O	1,000 ± 5	Na ₂ SiO ₃	ANS053
Sn (Tin)	10% HCl	1,000 ± 5	Sn	ANS055
Sr (Stroncium)	2% HNO ₃	1,000 ± 5	SrCO ₃	ANS056
Ti (Titanium)	1% HF + 5% HNO ₃	1,000 ± 5	Ti	ANS061
Tl (Thallium)	2% HNO ₃	1,000 ± 5	TlNO ₃	ANS062
V (Vanadium)	2% HNO ₃	1,000 ± 5	NH ₄ VO ₃	ANS065



1,000 mg/l Standards (continued)

Analyte	Matrix	Concentration (mg/l)	Starting material	Product code
W (Tungsten)	2% NH ₄ OH	1,000 ± 5	(NH ₄) ₁₀ W ₁₂ O ₄₁ ·5H ₂ O	ANS066
Zn (Zinc)	2% HNO ₃	1,000 ± 5	Zn	ANS069
Cl ⁻ (Chlorides)	H ₂ O	1,000 ± 5	KCl	ANS072
F (Fluorides)	H ₂ O	1,000 ± 5	NaF	ANS073
NO ₂ ⁻ (Nitrites)	H ₂ O	1,000 ± 5	NaNO ₂	ANS075
NO ₃ ⁻ (Nitrates)	H ₂ O	1,000 ± 5	NH ₄ NO ₃	ANS076
PO ₄ ³⁻ (Phosphates)	H ₂ O	1,000 ± 5	NH ₄ H ₂ PO ₄	ANS077
SO ₄ ²⁻ (Sulfates)	H ₂ O	1,000 ± 5	(NH ₄) ₂ SO ₄	ANS078
Cr ⁶⁺ (Chromium VI)	H ₂ O	1,000 ± 5	K ₂ Cr ₂ O ₇	ANS079
NH ₄ ⁺ (Ammonium)	H ₂ O	1,000 ± 5	NH ₄ Cl	ANS080

10,000 mg/l Standards

Analyte	Matrix	Concentration (mg/l)	Starting material	Product code
Ag (Silver)	2% HNO ₃	10,000 ± 50	Ag	ANS201
Al (Aluminium)	5% HCl	10,000 ± 50	Al	ANS202
Al (Aluminium)	5% HNO ₃	10,000 ± 50	Al	ANS202N
As (Arsenic)	2% HNO ₃	10,000 ± 50	As	ANS203
B (Boron)	2% NH ₄ OH	10,000 ± 50	H ₃ BO ₃	ANS205
Ba (Barium)	2% HNO ₃	10,000 ± 50	BaCO ₃	ANS206
Bi (Bismuth)	5% HNO ₃	10,000 ± 50	Bi	ANS208
Ca (Calcium)	2% HNO ₃	10,000 ± 50	CaCO ₃	ANS209
Cd (Cadmium)	2% HNO ₃	10,000 ± 50	Cd	ANS210
Co (Cobalt)	2% HNO ₃	10,000 ± 50	Co	ANS212
Cr (Chromium)	2% HNO ₃	10,000 ± 50	Cr(NO ₃) ₃ ·9H ₂ O	ANS213
Cu (Copper)	2% HNO ₃	10,000 ± 50	Cu	ANS215
Fe (Iron)	5% HNO ₃	10,000 ± 50	Fe	ANS219
Hg (Mercury)	5% HNO ₃	10,000 ± 50	Hg	ANS224
K (Potassium)	H ₂ O	10,000 ± 50	KNO ₃	ANS228
Li (Lithium)	2% HNO ₃	10,000 ± 50	Li ₂ CO ₃	ANS230
Mg (Magnesium)	2% HNO ₃	10,000 ± 50	Mg	ANS232
Mn (Manganese)	2% HNO ₃	10,000 ± 50	Mn	ANS233
Mo (Molybdenum)	2% NH ₄ OH	10,000 ± 50	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	ANS234
Na (Sodium)	H ₂ O	10,000 ± 50	NaNO ₃	ANS235
Ni (Nickel)	2% HNO ₃	10,000 ± 50	Ni	ANS238
P (Phosphorus)	0.05% H ₂ SO ₄	10,000 ± 50	NH ₄ H ₂ PO ₄	ANS240
Pb (Lead)	2% HNO ₃	10,000 ± 50	Pb	ANS241
Sb (Antimony)	10% HCl	10,000 ± 50	Sb	ANS250
Se (Selenium)	2% HNO ₃	10,000 ± 50	Se	ANS251
Si (Silicon)	H ₂ O	10,000 ± 50	Na ₂ SiO ₃	ANS253
Sn (Tin)	20% HCl	10,000 ± 50	Sn	ANS255
Sr (Stroncium)	2% HNO ₃	10,000 ± 50	SrCO ₃	ANS256
Ti (Titanium)	1% HF + 5% HNO ₃	10,000 ± 50	Ti	ANS261
Tl (Thallium)	2% HNO ₃	10,000 ± 50	TlNO ₃	ANS262
V (Vanadium)	2% HNO ₃	10,000 ± 50	NH ₄ VO ₃	ANS265
W (Tungsten)	2% NH ₄ OH	10,000 ± 50	(NH ₄) ₁₀ W ₁₂ O ₄₁ ·5H ₂ O	ANS266
Zn (Zinc)	2% HNO ₃	10,000 ± 50	Zn	ANS269
Cl ⁻ (Chlorides)	H ₂ O	10,000 ± 50	KCl	ANS272

10,000 mg/l Standards (continued)

Analyte	Matrix	Concentration (mg/l)	Starting material	Product code
F ⁻ (Fluorides)	H ₂ O	10,000 ± 50	NaF	ANS273
NO ₂ ⁻ (Nitrites)	H ₂ O	10,000 ± 50	NaNO ₂	ANS275
NO ₃ ⁻ (Nitrates)	H ₂ O	10,000 ± 50	NH ₄ NO ₃	ANS276
PO ₄ ³⁻ (Phosphates)	H ₂ O	10,000 ± 50	NH ₄ H ₂ PO ₄	ANS277
SO ₄ ²⁻ (Sulfates)	H ₂ O	10,000 ± 50	(NH ₄) ₂ SO ₄	ANS278
Cr ⁶⁺ (Chromium VI)	H ₂ O	10,000 ± 50	K ₂ Cr ₂ O ₇	ANS279
NH ₄ ⁺ (Ammonium)	H ₂ O	10,000 ± 50	NH ₄ Cl	ANS280





CERTIFIED REFERENCE MATERIALS FOR ION CHROMATOGRAPHY

Single element standards ASTASOL®-IC for ion chromatography

- » For calibration and validation of analytical methods analysing aqueous solutions ion chromatography
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Available in concentrations 100 mg/l and 1,000 mg/l
- » Directly traceable to SI units
- » Prepared from high purity starting material and ultrapure demineralized water (resistivity ~ 18MΩ.cm, 0.22µm filtered)
- » Delivered in amber HDPE laboratory grade bottles
- » Expiration time 12 months, wherever possible
- » Supplied with the Certificate designed in accordance with ISO Guide 31
- » Available in volumes 30 ml, 50 ml, 100 ml, 250 ml and 500 ml

1,000 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ba (Barium)	H ₂ O	1,000 ± 2	Ba(NO ₃) ₂	AN90061HIC
Ca (Calcium)	H ₂ O	1,000 ± 2	Ca(NO ₃) ₂ ·XH ₂ O	AN90091HIC
Cs (Cesium)	H ₂ O	1,000 ± 2	CsNO ₃	AN90141HIC
K (Potassium)	0.005% HNO ₃	1,000 ± 2	KNO ₃	AN90281NIC
Li (Lithium)	0.005% HNO ₃	1,000 ± 2	Li ₂ CO ₃	AN90301NIC
Mg (Magnesium)	H ₂ O	1,000 ± 2	Mg(NO ₃) ₂ ·XH ₂ O	AN90321HIC
Na (Sodium)	0.005% HNO ₃	1,000 ± 2	NaNO ₃	AN90351NIC
Rb (Rubidium)	0.005% HNO ₃	1,000 ± 2	RbNO ₃	AN90451NIC
Sr (Strontium)	0.005% HNO ₃	1,000 ± 2	Sr(NO ₃) ₂	AN90561NIC
Br (Bromides)	H ₂ O	1,000 ± 2	KBr	AN90711HIC
Cl ⁻ (Chlorides)	H ₂ O	1,000 ± 2	KCl	AN90721HIC
F (Fluorides)	H ₂ O	1,000 ± 2	NaF	AN90731HIC
NO ₂ ⁻ (Nitrites)	H ₂ O	1,000 ± 2	NaNO ₂	AN90751HIC
NO ₃ ⁻ (Nitrates)	H ₂ O	1,000 ± 2	NH ₄ NO ₃	AN90761HIC
PO ₄ ³⁻ (Phosphates)	H ₂ O	1,000 ± 2	NH ₄ H ₂ PO ₄	AN90771HIC
SO ₄ ²⁻ (Sulfates)	H ₂ O	1,000 ± 2	(NH ₄) ₂ SO ₄	AN90781HIC
NH ₄ ⁺ (Ammonium)	H ₂ O	1,000 ± 2	NH ₄ Cl	AN90801HIC

100 mg/l Standards

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Ba (Barium)	H ₂ O	100.0 ± 0.2	Ba(NO ₃) ₂	AN8006HIC
Ca (Calcium)	H ₂ O	100.0 ± 0.2	Ca(NO ₃) ₂ ·XH ₂ O	AN8009HIC
Cs (Cesium)	H ₂ O	100.0 ± 0.2	CsNO ₃	AN8014HIC
K (Potassium)	0.005% HNO ₃	100.0 ± 0.2	KNO ₃	AN8028NIC
Li (Lithium)	0.005% HNO ₃	100.0 ± 0.2	Li ₂ CO ₃	AN8030NIC
Mg (Magnesium)	H ₂ O	100.0 ± 0.2	Mg(NO ₃) ₂ ·XH ₂ O	AN8032HIC
Na (Sodium)	0.005% HNO ₃	100.0 ± 0.2	NaNO ₃	AN8035NIC
Rb (Rubidium)	0.005% HNO ₃	100.0 ± 0.2	RbNO ₃	AN8045NIC
Sr (Strontium)	0.005% HNO ₃	100.0 ± 0.2	Sr(NO ₃) ₂	AN8056NIC
Br (Bromides)	H ₂ O	100.0 ± 0.2	KBr	AN8071HIC

100 mg/l Standards (continued)

Analyte	Matrix (v/v)	Concentration (mg/l)	Starting material	Product code
Cl ⁻ (Chlorides)	H ₂ O	100.0 ± 0.2	KCl	AN8072HIC
F ⁻ (Fluorides)	H ₂ O	100.0 ± 0.2	NaF	AN8073HIC
NO ₂ ⁻ (Nitrites)	H ₂ O	100.0 ± 0.2	NaNO ₂	AN8075HIC
NO ₃ ⁻ (Nitrates)	H ₂ O	100.0 ± 0.2	NH ₄ NO ₃	AN8076HIC
PO ₄ ³⁻ (Phosphates)	H ₂ O	100.0 ± 0.2	NH ₄ H ₂ PO ₄	AN8077HIC
SO ₄ ²⁻ (Sulfates)	H ₂ O	100.0 ± 0.2	(NH ₄) ₂ SO ₄	AN8078HIC
NH ₄ ⁺ (Ammonium)	H ₂ O	100.0 ± 0.2	NH ₄ Cl	AN8080HIC

Multi-elements standards ASTASOL®-IC for ion chromatography

- » For calibration and validation of analytical methods analysing aqueous solutions ion chromatography
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Directly traceable to SI units
- » Prepared from high purity starting material and ultrapure demineralized water (resistivity ~ 18MΩ.cm, 0.22µm filtered)
- » Delivered in amber HDPE laboratory grade bottles
- » Expiration time 12 months, wherever possible
- » Supplied with the Certificate designed in accordance with ISO Guide 31
- » Available in volumes 30 ml, 50 ml, 100 ml, 250 ml and 500 ml

Analyte	Matrix (v/v)	Concentration (mg/l)	Product code
Br ⁻ , Cl ⁻ , F ⁻	H ₂ O	1,000	AN9100MHIC
NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻	H ₂ O	1,000	AN9101MHIC
Br ⁻ , Cl ⁻ , F ⁻ , NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻	H ₂ O	100	AN9102MHIC
Ba, Ca, K, Li, Mg, Na, NH ₄ ⁺ , Sr	H ₂ O	100	AN9103MHIC
Ba, Ca, K, Li, Mg, Mn, Na, NH ₄ ⁺ , Sr	0.1% HNO ₃	100	AN9105MNIC
Br ⁻ , Cl ⁻ , F ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻	H ₂ O	1,000	AN9106MHIC
N-(NH ₄ ⁺), N-(NO ₃ ⁻), P-(PO ₄ ³⁻), S-(SO ₄ ²⁻)	H ₂ O	100	AN9107MHIC





Ion chromatography standards

- » For calibration of analytical methods analysing aqueous solutions ion chromatography
- » Available in concentrations 1,000 mg/l and 5,000 mg/l
- » Prepared from pure starting material and ultrapure demineralized water (resistivity ~ 18MΩ.cm, 0.22µm filtered)
- » Delivered in amber HDPE laboratory grade bottles
- » Expiration time 12 months
- » Available in volumes 100 ml and 500 ml

1,000 mg/l standards

Analyte	Matrix	Concentration (mg/l)	Starting material	Product code
Formate HCOO ⁻	H ₂ O	1,000 ± 10	HCOONH ₄	OIC001
Acetate CH ₃ COO ⁻	H ₂ O	1,000 ± 5	CH ₃ COONH ₄	OIC002
Oxalate (COO) ₂ ²⁻	H ₂ O	1,000 ± 5	(COO) ₂ (NH ₄) ₂ ·H ₂ O	OIC003
Tartrate (CHOH) ₂ (COO) ₂ ²⁻	H ₂ O	1,000 ± 10	(CHOH) ₂ (COO) ₂ (NH ₄) ₂	OIC004
Propionate CH ₃ CH ₂ COO ⁻	H ₂ O	1,000 ± 10	CH ₃ CH ₂ COONa	OIC005
Monoethanolamine NH ₂ CH ₂ CH ₂ OH	H ₂ O	1,000 ± 10	NH ₂ CH ₂ CH ₂ OH	OIC006

5,000 mg/l standards

Analyte	Matrix	Concentration (mg/l)	Starting material	Product code
Formate HCOO ⁻	H ₂ O	5,000 ± 50	HCOONH ₄	OIC551
Acetate CH ₃ COO ⁻	H ₂ O	5,000 ± 25	CH ₃ COONH ₄	OIC552
Oxalate (COO) ₂ ²⁻	H ₂ O	5,000 ± 25	(COO) ₂ (NH ₄) ₂ ·H ₂ O	OIC553
Tartrate (CHOH) ₂ (COO) ₂ ²⁻	H ₂ O	5,000 ± 50	(CHOH) ₂ (COO) ₂ (NH ₄) ₂	OIC554
Propionate CH ₃ CH ₂ COO ⁻	H ₂ O	5,000 ± 50	CH ₃ CH ₂ COONa	OIC555
Monoethanolamine NH ₂ CH ₂ CH ₂ OH	H ₂ O	5,000 ± 50	NH ₂ CH ₂ CH ₂ OH	OIC556

Eluents (concentrates)

- » Available in volumes 100 ml or 500 ml
- » Another concentrations and volumes are available on request

Eluent solution	Concentration	Volume (ml)	Product code
Eluent concentrate Na ₂ CO ₃	0.25M Na ₂ CO ₃	100	IC-CON 1
Eluent concentrate NaHCO ₃	0.25M NaHCO ₃	100	IC-CON 2
Eluent concentrate Na ₂ CO ₃ + NaHCO ₃	0.125M Na ₂ CO ₃ + 0.125M NaHCO ₃	100	IC-CON 3
Hydrochloric acid concentrate	0.25M HCl	100	IC-CON 4
Eluent concentrate Na ₂ CO ₃	0.5M Na ₂ CO ₃	100	IC-CON 5
Eluent concentrate NaHCO ₃	0.5M NaHCO ₃	100	IC-CON 6
Eluent concentrate Na ₂ CO ₃ + NaHCO ₃	0.35M Na ₂ CO ₃ + 0.10M NaHCO ₃	100	IC-CON 7
Nitric acid concentrate	0.1M HNO ₃	500	IC-CON 8
Methanesulfonic acid concentrate	1.8M CH ₃ SO ₃ H	500	IC-CON 9
Nitric acid chelation solution concentrate	2M HNO ₃	500	IC-CON 10

Calibration solutions for the determination of organic and inorganic carbon

For use with EN 1484-43

Analyte	Concentration (mg/l)	Product code	Starting material	Matrix
C _{anorg} (TIC)	1,000 ± 2	TIC1H5	Na ₂ CO ₃ + NaHCO ₃ 1:1	H ₂ O
C _{org} (TOC)	1,000 ± 2	TOC1H5	Potassium hydrogenphthalate	H ₂ O
C _{anorg} + C _{org} (1:1)	1,000 ± 2	TIOC1H5		H ₂ O



TUNING, VERIFICATION AND INTERNAL STANDARD SOLUTIONS FOR ICP-OES&MS

- » Manufactured in accordance with ISO Guide 34
- » Delivered in amber HDPE or transparent FEP laboratory grade bottles
- » Supplied with the Identification sheet designed in accordance with ISO Guide 31
- » Available in volumes 25 ml, 50 ml, 100 ml, 250 ml, 500 ml and 1,000 ml

TUNE 1

Tuning solution

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ba, Be, Bi, Ce, Co, In, Li, Ni, Pb, U	10

TUNE 2

Tuning solution

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ca, Fe, K, Li, Na	10

TUNE 3

Tuning solution

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Se, Ti, V, U, Zn	10

TUNE 4

Tuning solution

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, In, Pb, Se, V	10

TUNE 5

Tuning solution

Discontinued - replaced by TUNE 9

TUNE 6

Tuning solution

Matrix: 2% HNO₃ + tr. HF (v/v)

Analytes	Concentration (µg/l)
Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, K, La, Li, Lu, Mg, Mn, Mo, Na, Nb, Nd, Ni, P, Pb, Pd, Pr, Rb, Re, Sb, Se, Sc, Si, Sm, Sn, Sr, Ta, Tb, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr	50

TUNE 7

Tuning solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)	Analytes	Concentration (µg/l)
Be	35	Ag, Mn	6
Zn	20	Sr	5
Cu, Ni	15	Ba, Tl	4
Al, Ga, Mg	10	Bi, Ce, Cs, Ho, In, Rh, Ta, Tb, U, Y	3
Co, Li, Sc	8		

TUNE 8

Tuning solution

Matrix: 2% HNO₃ + 0.5% HCl (v/v)

Analytes	Concentration (µg/l)
Ba, Bi, Ce, Co, In, Li, U	1

TUNE 9

Tuning solution

Matrix: 5% HNO₃ + 0.1% HF (v/v)

Analytes	Concentration (mg/l)	Analytes	Concentration (mg/l)
Se	625	Ag, Cr, Na, Sb, V	20
Ca, P, Si	500	Co, K, Zr	17.5
Be, Te, Ti	250	Rb, Sc	15
As	125	Dy, W, Yb	12.5
B	100	Fe, Mn, Nb, Sr	10
Cu, Ge, Ni, Zn	75	Cs, Er, Hf, Re, Y	7.5
Cd, Li, Mo, Pd	50	Ce, Eu, In, La, Pb, Pr, Tl	5
Al, Ba, Mg	25	Bi, Ho, Lu, Ta, Tb, Th, Tm, U	2.5
Ga, Gd, Nd, Sm, Sn	22.5		

TUNE 10

Tuning solution

Matrix: 3% HNO₃ (v/v)

Analytes	Concentration (mg/l)	Analytes	Concentration (mg/l)
Fe	3,000	Hf, Nd, Pb, Sr, U	200
Li	1,000	Tl	50

TUNE 20

ICP calibration standard

Matrix: 10% HNO₃ + 0.1% HF (v/v)

Analytes	Concentration (mg/l)
Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Th, Tl, U, V, Zn	1,000
Ca, Fe, K, Mg, Na	10

TUNE 21

Tuning solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
As, Be, Cd, Zn	20
Mg, Pb, Sc	10
Al, Ba, Bi, Co, Cr, Cu, In, ⁶ Li, Lu, Mn, Na, Ni, Sr, Th, Tl, U, V	5
Y, Yb	2.5

TUNE 22

Tuning solution

Matrix: 5% HCl (v/v)

Analytes	Concentration (mg/l)
Ge, Mo, Pd, Ru, Sb, Sn	10
Ir, Ti	5



TUNE 23

Tuning solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ce, Co, Li, Tl, Y	10

TUNE 24

ICP calibration standard

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, Hg, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Se, Sr, Tl, U, V, Zn	10

TUNE 25

Tuning solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (µg/l)
Ce, Co, Li, Mg, Tl, Y	1

TUNE 28

ICP calibration standard

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
K	50
Al, As, Ba, Cd, Co, Cr, Cu, K, Mn, Mo, Ni, Pb, Se, Sr, Zn	5

TUNE 29

Tuning solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ba, Be, Ce, Co, In, Mg, Pb, Th, Tl	10

TUNE 35

ICP calibration standard

Matrix: 2% HNO₃ + tr. HF(v/v)

Analytes	Concentration (mg/l)
B, Ge, Mo, Nb, P, Re, S, Si, Ta, Ti, W, Zr	10

TUNE 36

ICP calibration standard

Matrix: 5% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th, Tm, Y, Yb	10

TUNE 37

ICP calibration standard

Matrix: 10% HCl + 1% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Au, Hf, Ir, Pd, Pt, Rh, Ru, Sb, Sn, Te	10

TUNE 40

Setup solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (µg/l)
Ba, Ce, Ge, Mg, Sc, Tl, Cd, Cu, Pb, Rh, Tb	10

TUNE 41

DL solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (µg/l)
Be, Co, In, Tl, U	10

TUNE 42

DD calibration solution

Matrix: 2% HNO₃ + tr. HCl (v/v)

Analytes	Concentration (µg/l)
Cd, Cu, Mg, Pb, Rh	200

TUNE 43

VIS wave calibration solution

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)	Analytes	Concentration (mg/l)
K	50	Ba, Ca	1
La, Li, Mn, Na, Sr	10		

TUNE 44

Instrument check standard

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, V, Zn	10

TUNE 45

Tuning solution

Matrix: 5% HCl + 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Ba, Be, Ce, Co, In, Li, Mg, Pb, Rh, Tl, U, Y	10

TUNE 46

ICP calibration standard

Matrix: 2% HNO₃ (v/v)

Analytes	Concentration (mg/l)
Bi, Ce, Co, In, Mg, Ni, Pb, U	10

Internal standards

Product code	Analytes	Matrix	Concentration (mg/l)
INT-MIX 1	Bi, In, Sc, Tb, Y	5% HNO ₃	10
INT-MIX 2	Au, Rh	5% HCl	10
INT-MIX 3	Bi, Ge, In, ⁶ Li, Sc, Tb, Y	5% HNO ₃ + tr. HF	10
INT-MIX 4	Bi, Ge, In, ⁶ Li, Lu, Rh, Sc, Tb	10% HNO ₃ + tr. HCl	100
INT-MIX 5	Bi, Ge, In, ⁶ Li, Lu, Rh, Sc, Tb	10% HNO ₃ + tr. HCl	10
INT-MIX 6	Bi, In, ⁶ Li, Sc, Tb, Y	5% HNO ₃	100

Other tuning, setup or verification solutions for various instruments and internal standards can be supplied on request.

For blank solution of diluted acids see page 31.



AUXILIARY REAGENTS

Deionizers

Product code	Agent	Matrix	Concentration (g/l)	Starting material	Volume (ml)
V001	CsCl	H ₂ O	25	CsCl	500
V002	KCl	H ₂ O	25	KCl	500

Releasing agents

Product code	Agent	Matrix (v/v)	Concentration (g/l)	Starting material	Volume (ml)
V003	LaCl ₃	2% HCl	25	La ₂ O ₃	500

Deionizers + Releasing agents

Product code	Agent	Matrix (v/v)	Concentration (g/l)	Starting material	Volume (ml)
V0042	CsCl	2% HCl	10	CsCl	250
	La(LaCl ₃)		100	La ₂ O ₃	

Matrix modifiers for ET - AAS

Product code	Agent	Matrix (v/v)	Concentration (g/l)	Starting material	Volume (ml)
V004	Pd	2% HNO ₃	1	Pd	50
	Mg(NO ₃) ₂		0.6	Mg(NO ₃) ₂ ·6H ₂ O	
V005	Pd	5% HNO ₃	2	Pd	50
V0051	Pd	5% HNO ₃	10	Pd	25
V006	Mg	0.2% HNO ₃	2	Mg(NO ₃) ₂ ·6H ₂ O	50
V0061	Mg	0.2% HNO ₃	10	Mg(NO ₃) ₂ ·6H ₂ O	25
V007	NH ₄ H ₂ PO ₄	H ₂ O	200	NH ₄ H ₂ PO ₄	50
V008	Ascorbic acid	H ₂ O	10	Ascorbic acid	50
V009	Ni(NO ₃) ₂ ·6H ₂ O	1% HNO ₃	10	Ni(NO ₃) ₂ ·6H ₂ O	50
V0091	Ni(NO ₃) ₂ ·6H ₂ O	1% HNO ₃	50	Ni(NO ₃) ₂ ·6H ₂ O	25
V010	NH ₄ NO ₃	1% HNO ₃	50	NH ₄ NO ₃	50
V011	Ca(NO ₃) ₂ ·4H ₂ O	1% HNO ₃	20	Ca(NO ₃) ₂ ·4H ₂ O	25

Sodium borohydride

Product code	Agent	Matrix	Concentration (g/l)	Starting material	Weight (g)
SCH01111	NaBH ₄	-	neat	NaBH ₄	100

REFERENCE MATERIALS OF PHYSICAL PROPERTIES

Certified reference materials pHana™- calibration buffers for pH measurement

- » For calibration of pH measurement and validation of analytical methods determining pH
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Traceable to NIST SRM and thus to international pH scale IUPAC
- » Prepared from high purity starting material and ultrapure demineralized water (resistivity ~ 18 MΩ.cm)
- » Temperature dependance data in the Certificate
- » Delivered in transparent HDPE laboratory grade bottles
- » Expiration time 12 months
- » Supplied with the Certificate designed in accordance with ISO Guide 31
- » Available in volumes 100 ml, 250 ml and 500 ml

Product code	pH value
CRMPH1677	1.677 ± 0.010
CRMPH3781	3.788 ± 0.010
CRMPH4001	4.001 ± 0.010
CRMPH6881	6.881 ± 0.010
CRMPH7429	7.429 ± 0.010
CRMPH9225	9.225 ± 0.010
CRMPH10062	10.062 ± 0.020

Certified reference materials CONDUCTANAL™- calibration solutions for the measurement of conductivity

- » For calibration of instruments used for the determination of conductivity and for validation of analytical methods measuring conductivity
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Prepared from high purity starting material and ultrapure demineralized water (resistivity ~ 18 MΩ.cm)
- » Delivered in transparent HDPE laboratory grade bottles
- » Expiration time 12 months
- » Supplied with the Certificate designed in accordance with ISO Guide 31
- » Available in volumes 100 ml, 250 ml and 500 ml

Product code	Conductivity (µS/cm)
CON 01	147.0 ± 1.5
CON 02	1,015 ± 10
CON 03	1,413 ± 14
CON 04	12,880 ± 70
CON 05	111,300 ± 900



Reference materials pHanal™ - calibration buffers for pH measurement

- » Calibrants for routine pH measurements
- » Manufactured under ISO Guide 34 and ISO 17 025
- » Color coded variations available
- » Prepared from high purity starting material and ultrapure demineralized water (resistivity ~ 18 MΩ.cm)
- » Temperature dependance data in the Identification sheet
- » Delivered in transparent HDPE laboratory grade bottles
- » Expiration time 12 months
- » Supplied with the Identification sheet designed in accordance with ISO Guide 31
- » Available in volumes 100 ml, 250 ml, 500 ml, 1,000 ml and 5,000 ml

Product code	pH value
PH04	4.00 ± 0.02
PH04B	4.00 ± 0.02
PH07	7.00 ± 0.02
PH07B	7.00 ± 0.02
PH09	9.00 ± 0.02
PH10	10.00 ± 0.02
PH10B	10.00 ± 0.02



HIGH AND ULTRA-HIGH PURITY MINERAL ACIDS AND OTHER REAGENTS

ANALPURE® ULTRA reagents

- » Extremely low trace metal impurities, in most cases less than 10 ppt
- » Ultra-pure acids are intended for use in semiconductor, nuclear, clinical, pharmaceutical, geochemical analysis, and wherever the highest purity acids are required
- » Ultra-pure acids filled in fluoropolymere bottles
- » Supplied with a Protocol of Analysis with specification for over 60 analytes

Product code	Description	Volume (ml)
UAc0061x	HNO ₃ , min. 67%, ANALPURE® ULTRA	250
UAc0061a	HNO ₃ , min. 67%, ANALPURE® ULTRA	500
UAc0061b	HNO ₃ , min. 67%, ANALPURE® ULTRA	1,000
UAc0061e	HNO ₃ , min. 67%, ANALPURE® ULTRA	2,000
UAc0031x	HCl, min. 36%, ANALPURE® ULTRA	250
UAc0031a	HCl, min. 36%, ANALPURE® ULTRA	500
UAc0031b	HCl, min. 36%, ANALPURE® ULTRA	1,000
UAc0031e	HCl, min. 36%, ANALPURE® ULTRA	2,000
UAc0012x	H ₂ SO ₄ , min. 95%, ANALPURE® ULTRA	250
UAc0012a	H ₂ SO ₄ , min. 95%, ANALPURE® ULTRA	500
UAc0012b	H ₂ SO ₄ , min. 95%, ANALPURE® ULTRA	1,000
UAc0012e	H ₂ SO ₄ , min. 95%, ANALPURE® ULTRA	2,000
UAc0091x	HF, min. 48%, ANALPURE® ULTRA	250
UAc0091a	HF, min. 48%, ANALPURE® ULTRA	500
UAc0091b	HF, min. 48%, ANALPURE® ULTRA	1,000
UAc0091e	HF, min. 48%, ANALPURE® ULTRA	2,000
UAc0019x	HBr, min. 44 - 49%, ANALPURE® ULTRA	250
UAc0019a	HBr, min. 44 - 49%, ANALPURE® ULTRA	500
UAc0019b	HBr, min. 44 - 49%, ANALPURE® ULTRA	1,000
UAc0019e	HBr, min. 44 - 49%, ANALPURE® ULTRA	2,000
UAc0017x	CH ₃ COOH, min. 99.5%, ANALPURE® ULTRA	250
UAc0017a	CH ₃ COOH, min. 99.5%, ANALPURE® ULTRA	500
UAc0017b	CH ₃ COOH, min. 99.5%, ANALPURE® ULTRA	1,000
UCH0170x	NH ₄ OH, min. 21%, ANALPURE® ULTRA	250
UCH0170a	NH ₄ OH, min. 21%, ANALPURE® ULTRA	500
UCH0170b	NH ₄ OH, min. 21%, ANALPURE® ULTRA	1,000
UCH02161a	Hydrogen Peroxide, ANALPURE® ULTRA	500
UAq0001b	Water, ANALPURE® ULTRA	1,000

NEW

HIGH PURITY DILUTED ACIDS

Product code	Description	Volume (ml)
UAc0061-BLANK2	2% HNO ₃ , ANALPURE® ULTRA	500
UAc0061-BLANK5	5% HNO ₃ , ANALPURE® ULTRA	500
UAc0031-BLANK5	5% HCl, ANALPURE® ULTRA	500
SAc0061-BLANK2	2% HNO ₃ , ANALPURE®	500
SAc0061-BLANK5	5% HNO ₃ , ANALPURE®	500
SAc0031-BLANK5	5% HCl, ANALPURE®	500

ANALPURE® reagents

- » High purity acids are intended for use in environmental and industrial applications
- » Trace metal impurities guaranteed equal to or less than 1 ppb
- » High purity acids filled in specially leached HDPE bottles
- » Supplied with a Protocol of Analysis with specification for over 60 analytes
- » Also available in volume 500 ml on request

Product code	Description	Volume (ml)
SAC0031b	HCl, min. 36%, ANALPURE®	1,000
SAC0031e	HCl, min. 36%, ANALPURE®	2,500
SAC0032b	HCl, min. 29 - 31%, ANALPURE® NEW	1,000
SAC0061b	HNO ₃ , min. 67%, ANALPURE®	1,000
SAC0061e	HNO ₃ , min. 67%, ANALPURE®	2,500
SAC0091b	HF, min. 48%, ANALPURE®	1,000
SAC0012b	H ₂ SO ₄ , min. 95%, ANALPURE®	1,000
SAC0012e	H ₂ SO ₄ , min. 95%, ANALPURE®	2,500
SAC11002b	HClO ₄ , min. 68%, ANALPURE®	1,000
SAC11002e	HClO ₄ , min. 68%, ANALPURE®	2,500
SAC0017b	CH ₃ COOH, min. 99.5%, ANALPURE®	1,000
SAC0017e	CH ₃ COOH, min. 99.5%, ANALPURE®	2,500
SCH0170a	NH ₄ OH, min. 21%, ANALPURE®	500
SAq0001b	Low organic water (TOC, LC, HPLC)	1,000

ANALYTIKA® p.a.+ grade acids and H₂O₂

- » Economical solution for various lab applications and cleaning purposes
- » Meet or exceed the requirements of ACS, ISO and or R.G.
- » Supplied with a Specification sheet with the most important parameters

Product code	Description	Volume (ml)
SAC10001	HClO ₄ , min. 68%, p. a. +	1,000
SAC20001	HCl, min. 37%, p.a. +	1,000
SAC30001	HNO ₃ , min. 65%, p.a. +	1,000
SAC40001	HF, min. 48%, p.a. +	1,000
SAC50001	H ₂ SO ₄ , min. 96%, p.a. +	1,000
SAC70001	CH ₃ COOH, min. 99,5%, p.a. +	1,000
SAC70002	CH ₃ COOH, min. 99,5%, p.a. +	2,500
SCH02161	H ₂ O ₂ , 30%, p.a. +	1,000

Bottle-top dispensers for high purity acids and HF

Product code	Product	Description
USS01	Teflon™ Dispenser ANALPURE®-ULTRA, 0-5 ml	Specially leached bottle-top dispenser for high purity acids
USS02	Teflon™ Dispenser ANALPURE®, 0-5 ml	Bottle-top Dispenser for Hydrofluoric acid
USS03	Adaptor for Dispenser ANALPURE®-ULTRA, 45 mm	Optional adaptor for installing ANALPURE®-ULTRA Dispenser to non-standard necks
USS04	Base for Dispenser ANALPURE®-ULTRA	Adjustable base for ANALPURE®-ULTRA bottles



REFERENCE MATERIALS FOR CHROMATOGRAPHY

- » Manufactured in accordance with ISO Guide 34
- » Characterization based on gravimetric preparation
- » Packed in CERTAN® bottles
- » Supplied with the Identification sheet designed in accordance with ISO Guide 31
- » Various matrices (acetonitrile, acetone, cyclohexane, dichloromethane, ethylacetate, n-hexane, iso-octane, methanol, n-nonane, 2-propanol, toluene)
- » Available in volumes 1.5 ml, 4.5 ml and 10 ml

Reference materials for the determination of polycyclic aromatic hydrocarbons (PAH)

Single analyte reference materials

- » Single analyte reference materials are available on request as custom standards.

Multi-analyte reference materials

PAH MIX-1 (WHO)

Product code	Solvent	Volume (ml)
CE001 1.5A	Acetonitrile	1.5
CE001 4.5A	Acetonitrile	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
benzo(b)fluoranthene	20	benzo(a)pyrene	20
benzo(k)fluoranthene	20	fluoranthene	50
benzo(g,h,i)perylene	20	indeno(1,2,3-c,d)pyrene	50

PAH MIX-2 (EPA 610)

Product code	Solvent	Volume (ml)
CE002 4.5A	Acetonitrile	4.5
CE002 4.5C	Cyclohexane	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
acenaphtene	10	chrysene	10
acenaphtylene	10	dibenzo(a,h)anthracene	10
anthracene	10	fluoranthene	10
benzo(a)anthracene	10	fluorene	10
benzo(b)fluoranthene	10	indeno(1,2,3-c,d)pyrene	10
benzo(k)fluoranthene	10	naphthalene	10
benzo(g,h,i)perylene	10	phenanthrene	10
benzo(a)pyrene	10	pyrene	10



PAH MIX-3 (EPA 610)

Product code	Solvent	Volume (ml)
CE003 1.5A	Acetonitrile	1.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
acenaphtene	500	chrysene	100
acenaphtylene	800	dibenzo(a,h)anthracene	200
anthracene	100	fluoranthene	200
benzo(a)anthracene	100	fluorene	200
benzo(b)fluoranthene	200	indeno(1,2,3-c,d)pyrene	100
benzo(k)fluoranthene	100	naphthalene	500
benzo(g,h,i)perylene	200	phenanthrene	100
benzo(a)pyrene	100	pyrene	100

PAH MIX-4

Product code	Solvent	Volume (ml)
CE004 1.5A	Acetonitrile	1.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
benzo(a)pyrene	100	fluoranthene	200

PAH MIX-5 (EPA 610)

Product code	Solvent	Volume (ml)
CE005 4.5T	Toluene	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
acenaphtene	100	chrysene	100
acenaphtylene	100	dibenzo(a,h)anthracene	100
anthracene	100	fluoranthene	100
benzo(a)anthracene	100	fluorene	100
benzo(b)fluoranthene	100	indeno(1,2,3-c,d)pyrene	100
benzo(k)fluoranthene	100	naphthalene	100
benzo(g,h,i)perylene	100	phenanthrene	100
benzo(a)pyrene	100	pyrene	100

PAH MIX-6

Product code	Solvent	Volume (ml)
CE006 1.5M	Methanol	1.5
CE006 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
anthracene	10	chrysene	10
benzo(a)anthracene	10	dibenzo(a,h)anthracene	20
benzo(b)fluoranthene	20	fluoranthene	20
benzo(k)fluoranthene	5	indeno(1,2,3-c,d)pyrene	20
benzo(g,h,i)perylene	20	naphthalene	40
benzo(a)pyrene	10	pyrene	40

PAH MIX-7 (ECC directive)

Product code	Solvent	Volume (ml)		
CE007 4.5A	Acetonitrile	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
benzo(b)fluoranthene	10		benzo(a)pyrene	10
benzo(k)fluoranthene	10		fluoranthene	10
benzo(g,h,i)perylene	10		indeno(1,2,3-c,d)pyrene	10

PAH MIX-8

Product code	Solvent	Volume (ml)		
CE008 4.5A	Acetonitrile	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
benzo(b)fluoranthene	2		benzo(a)pyrene	2
benzo(k)fluoranthene	2		fluoranthene	10
benzo(g,h,i)perylene	2		indeno(1,2,3-c,d)pyrene	2

PAH MIX-9

Product code	Solvent	Volume (ml)		
CE009 4.5A	Acetonitrile	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
acenaphtene	100		chrysene	100
acenaphtylene	1000		dibenzo(a,h)anthracene	100
anthracene	100		fluoranthene	100
benzo(a)anthracene	100		fluorene	100
benzo(b)fluoranthene	100		indeno(1,2,3-c,d)pyrene	100
benzo(k)fluoranthene	100		naphthalene	100
benzo(g,h,i)perylene	100		phenanthrene	100
benzo(a)pyrene	100		pyrene	100

PAH MIX-10

Product code	Solvent	Volume (ml)		
CE010 4.5A	Acetonitrile	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
acenaphtene	10		dibenzo(a,h)anthracene	10
anthracene	10		fluoranthene	10
benzo(a)anthracene	10		fluorene	10
benzo(b)fluoranthene	10		indeno(1,2,3-c,d)pyrene	10
benzo(k)fluoranthene	10		2-methylnaphthalene	10
benzo(g,h,i)perylene	10		naphthalene	10
benzo(a)pyrene	10		phenanthrene	10
chrysene	10		pyrene	10

Calibration solutions for the determination of polychlorinated biphenyls (PCB)

» Single analyte reference materials are available on request as custom standards

PCB MIX-1

Product code	Solvent	Volume (ml)
CE150 10I	Iso-octane	10

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
PCB 28	10	PCB 138	10
PCB 52	10	PCB 153	10
PCB 101	10	PCB 180	10
PCB 118	10	PCB 194	10

PCB MIX-2

Product code	Solvent	Volume (ml)
CE151 4.5M	Methanol	4.5
CE151 10M	Methanol	10

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
PCB 28	1	PCB 138	1
PCB 52	1	PCB 153	1
PCB 101	1	PCB 180	1
PCB 118	1	PCB 194	1



Calibration solutions for the determination of volatile organic compounds (VOC, BTEX)

Single analyte reference materials

Product code	Analyte	Concentration (µg/ml)	Solvent	Volume (ml)
CE200 4.5M	benzene	5,000	Methanol	4.5
CE222 4.5M	1,2-dichlorethane	5,000	Methanol	4.5
CE220 4.5M	trichloromethane	5,000	Methanol	4.5
CE237 1.5M	vinylchloride	200	Methanol	1.5
CE203 4.5M	o-xylene	5,000	Methanol	4.5
CE204 4.5M	m-xylene	5,000	Methanol	4.5
CE205 4.5M	p-xylene	5,000	Methanol	4.5

Other single analyte reference materials are available on request as custom standards.

Multi-analyte reference materials

BTEX MIX-1				
Product code	Solvent	Volume (ml)		
CE210 1.5M	Methanol	1.5		
CE210 4.5M	Methanol	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
benzene	2,000		o-xylene	2,000
ethylbenzene	2,000		m-xylene	2,000
toluene	2,000		p-xylene	2,000
Product code	Solvent	Volume (ml)		
CE2101 1.5M	Methanol	1.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
benzene	1,000		o-xylene	1,000
ethylbenzene	1,000		m-xylene	1,000
toluene	1,000		p-xylene	1,000

BTEX MIX-2				
Product code	Solvent	Volume (ml)		
CE211 1.5M	Methanol	1.5		
CE211 4.5M	Methanol	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
benzene	1,000		toluene	1,000
ethylbenzene	1,000		o-xylene	1,000
styrene	1,000		m-xylene	1,000
p-xylene	1,000			



VOC MIX-1

Product code	Solvent	Volume (ml)
CE280 1.5M	Methanol	1.5
CE280 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
chlorobenzene	1,000	cis-1,2-dichloroethylene	1,000
1,2-dichlorobenzene	1,000	1,1,2,2-tetrachloroethylene	1,000
1,3-dichlorobenzene	1,000	tetrachloromethane	1,000
1,4-dichlorobenzene	1,000	1,1,2-trichloroethylene	1,000
1,2-dichloroethane	1,000	trichloromethane	1,000
1,1-dichloroethylene	1,000		

VOC MIX-2

Product code	Solvent	Volume (ml)
CE281 10l	Iso-octane	10
CE281 1.5M	Methanol	1.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
bromodichloromethane	1,000	tetrachloromethane	1,000
dibromochloromethane	1,000	tribromomethane	1,000
1,2-dichloroethane	1,000	1,1,2-trichloroethylene	1,000
1,1,2,2-tetrachloroethylene	1,000	trichloromethane	1,000

VOC MIX-5

Product code	Solvent	Volume (ml)
CE284 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
1,1-dichloroethylene	1,000	1,1,2-trichloroethylene	1,000
cis-1,2-dichloroethylene	1,000	1,1,2,2-tetrachloroethylene	1,000
trans-1,2-dichloroethylene	1,000		

VOC MIX-6

Product code	Solvent	Volume (ml)
CE285 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
bromodichloromethane	1,000	tribromomethane	1,000
dibromochloromethane	1,000	trichloromethane	1,000

VOC MIX-7

Product code	Solvent	Volume (ml)
CE286 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
benzene	10	styrene	10
bromodichloromethane	20	1,1,2,2-tetrachloroethylene	20
chlorobenzene	5	tetrachloromethane	7.5
dibromochloromethane	20	toluene	10
1,2-dichlorobenzene	4	tribromomethane	20
1,3-dichlorobenzene	4	1,1,1-trichloroethane	10
1,4-dichlorobenzene	4	1,1,2-trichloroethylene	20
1,2-dichloroethane	25	trichloromethane	60
cis-1,2-dichloroethylene	20	m-xylene	10
ethylbenzene	10	o-xylene	10

VOC MIX-8

Product code	Solvent	Volume (ml)
CE287 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
bromodichloromethane	1,000	dichloromethane	1,000
chlorobenzene	1,000	1,1,1,2-tetrachloroethane	1,000
dibromochloromethane	1,000	1,1,2,2-tetrachloroethane	1,000
1,2-dichlorobenzene	1,000	1,1,2,2-tetrachloroethylene	1,000
1,3-dichlorobenzene	1,000	tetrachloromethane	1,000
1,4-dichlorobenzene	1,000	tribromomethane	1,000
1,1-dichloroethane	1,000	1,1,1-trichloroethane	1,000
1,2-dichloroethane	1,000	1,1,2-trichloroethane	1,000
1,1-dichloroethylene	1,000	1,1,2-trichloroethylene	1,000
cis-1,2-dichloroethylene	1,000	trichloromethane	1,000
trans-1,2-dichloroethylene	1,000		

VOC MIX-9

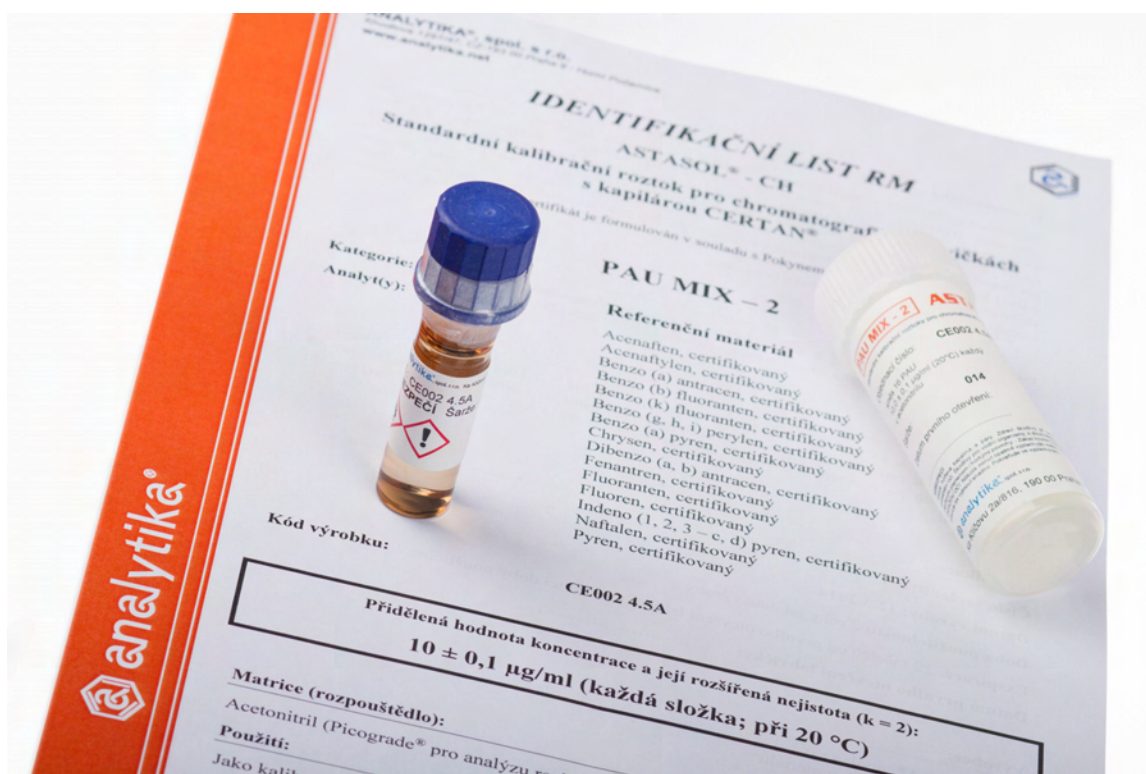
Product code	Solvent	Volume (ml)
CE288 4.5M	Methanol	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
benzene	200	toluene	200
bromodichloromethane	1,000	tribromomethane	1,000
dibromochloromethane	1,000	1,1,2-trichloroethylene	200
cis-1,2-dichloroethylene	200	trichloromethane	1,000
dichloromethane	1,000	o-xylene	200
ethylbenzene	200	m-xylene	200
styrene	200	p-xylene	200
1,1,2,2-tetrachloroethylene	200		



VOC MIX-10

Product code	Solvent	Volume (ml)		
CE289 10M	Methanol	10		
Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)	
benzene	100	styrene	100	
bromodichloromethane	100	1,1,2,2-tetrachloroethylene	100	
chlorobenzene	100	tetrachloromethane	100	
dibromochloromethane	100	toluene	100	
1,2-dichlorobenzene	100	tribromomethane	100	
1,3-dichlorobenzene	100	1,1,2-trichloroethylene	100	
1,4-dichlorobenzene	100	trichloromethane	100	
cis-1,2-dichloroethylene	100	o-xylene	100	
trans-1,2-dichloroethylene	100	m-xylene	100	
ethylbenzene	100	p-xylene	100	



Calibration solutions for the determination of pesticides (metabolites)

» Single analyte reference materials are available on request as custom standards

OCP MIX-1

Product code	Solvent	Volume (ml)
CE500 4.5l	Iso-octane	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
4,4'-DDT	10	hexachlorobenzene	10
gamma-HCH (lindane)	10	4,4'-methoxychlor	10
heptachlor	10		

OCP MIX-2

Product code	Solvent	Volume (ml)
CE501 4.5l	Iso-octane	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
4,4'-DDD	10	gamma-HCH (lindane)	10
4,4'-DDE	10	delta-HCH	10
4,4'-DDT	10	heptachlor	10
alpha-HCH	10	hexachlorobenzene	10
beta-HCH	10	4,4'-methoxychlor	10

OCP MIX-3

Product code	Solvent	Volume (ml)
CE502 10M	Methanol	10

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
4,4'-DDD	1	gamma-HCH (lindane)	1
4,4'-DDE	1	delta-HCH	1
4,4'-DDT	1	heptachlor	1
alpha-HCH	1	hexachlorobenzene	1
beta-HCH	1	4,4'-methoxychlor	1

OCP MIX-4

Product code	Solvent	Volume (ml)
CE503 1.5l	Iso-octane	1.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
aldrin	10	beta-endosulfan	10
4,4'-DDD	10	gamma-HCH (lindane)	10
4,4'-DDE	10	heptachlor	10
4,4'-DDT	10	hexachlorobenzene	10
dieldrin	10	4,4'-methoxychlor	10
endrin	10	trifluralin	10
alpha-endosulfan	10		



OCP + PCB MIX-1

Product code	Solvent	Volume (ml)
CE700 4.5I	Iso-octane	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
4,4'-DDD	10	4,4'-methoxychlor	10
4,4'-DDE	10	PCB 28	10
4,4'-DDT	10	PCB 52	10
alpha-HCH	10	PCB 101	10
beta-HCH	10	PCB 118	10
gamma-HCH (lindane)	10	PCB 138	10
delta-HCH	10	PCB 153	10
heptachlor	10	PCB 180	10
hexachlorobenzene	10	PCB 194	10

PEST MIX-5

Product code	Solvent	Volume (ml)
CE512 10A	Acetonitrile	10

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
atrazine	100	prometryn	100
atrazine-desethyl	100	simazine	100
hexazinone	100	terbutylazine	100

PEST MIX-6 (EN ISO 11369)

Product code	Solvent	Volume (ml)
CE513 4.5A	Acetonitrile	4.5

Analytes	Concentration (µg/ml)	Analytes	Concentration (µg/ml)
atrazine	100	methabenzthiazuron	100
atrazine-desethyl	100	metobromuron	100
chlorotoluron	100	metolachlor	100
cyanazine	100	metoxuron	100
diuron	100	monolinuron	100
hexazinone	100	sebutylazine	100
isoproturon	100	simazine	100
linuron	100	terbutylazine	100
metazachlor	100		

PEST MIX-10

Product code	Solvent	Volume (ml)		
CE520 10A	Acetonitrile	10		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
acetochlor	0.8		metazachlor	1.6
alachlor	0.4		metolachlor	0.4
ametryn	0.4		prometryn	0.4
atrazine	0.4		propachlor	0.8
chlorfenvinphos	0.8		propazine	0.4
cyanazine	1.6		sebutylazine	0.4
desmetryn	1.6		simazine	0.8
diazinone	0.4		terbutylazine	0.4
dichlobenil	0.4		terbutryne	0.4
lenacil	1.2		trietazine	0.4

Calibration solutions for the determination of phthalates (EPA 8060)

- » Single analyte reference materials are available on request as custom standards

FT MIX-1

Product code	Solvent	Volume (ml)		
CE840 1.5M	Methanol	1.5		
CE840 4.5M	Methanol	4.5		
Analytes	Concentration (µg/ml)		Analytes	Concentration (µg/ml)
bis-2(ethylhexyl)phthalate	100		dimethylphthalate	100
butylbenzylphthalate	100		di-n-butylphthalate	100
diethylphthalate	100		di-n-octylphthalate	100

MATRIX REFERENCE MATERIALS

- » Certified reference materials and reference materials (quality control materials)
- » Manufactured in accordance with ISO Guide 34
- » Delivered in amber HDPE or glass laboratory grade bottles

Certified matrix reference material

CRM CZ 70006		Packing:		60 g
PCDD, PCDF and toxic PCB in sewage sludge of mixed origin				
<i>Certified values and their uncertainties</i>				
Analyte		Mass fraction		Number of accepted sets of data
		Certified value (ng/kg) ¹⁾³⁾	Uncertainty (ng/kg) ²⁾	
2,3,7,8 TeCDD	(D48)	4.5	0.3	7
1,2,3,7,8 PeCDD	(D54)	2.1	0.3	7
1,2,3,4,7,8 HxCDD	(D66)	2.6	0.5	7
1,2,3,6,7,8 HxCDD	(D67)	5.0	0.9	9
1,2,3,7,8,9 HxCDD	(D70)	3.7	0.6	9
1,2,3,4,6,7,8 HpCDD	(D73)	65	10	7
OCDD	(D75)	519	74	7
2,3,7,8 TeCDF	(F83)	110	17	8
1,2,3,7,8 PeCDF	(F94)	157	21	8
2,3,4,7,8 PeCDF	(F114)	87	11	6
1,2,3,4,7,8 HxCDF	(F118)	376	63	9
1,2,3,6,7,8 HxCDF	(F121)	102	13	8
1,2,3,7,8,9 HxCDF	(F124)	11.0	2.2	7
2,3,4,6,7,8 HxCDF	(F130)	19.8	2.8	6
1,2,3,4,6,7,8 HpCDF	(F131)	256	41	9
1,2,3,4,7,8,9 HpCDF	(F134)	110	17	8
OCDF	(F135)	1590	290	9
PCB 77		2380	370	10
PCB 81		108	16	6
PCB 126		169	32	9
PCB 169		25	4	8
PCB 105		3430	500	10
PCB 114		169	36	6
PCB 118		15,800	2,300	10
PCB 123		121	30	6
PCB 156		9,140	1,300	8
PCB 157		802	130	10
PCB 167		4,130	670	10
PCB 189		1,860	260	8

1) This value is the unweighed mean of the means of accepted sets of results
2) Uncertainties are combined uncertainties multiplied by a coverage factor k=2
3) Dry mass at 105 °C

CRM CZ 70006 (continued)

Packing: 60 g

PCDD, PCDF and toxic PCB in sewage sludge of mixed origin

Non-certified values of some other analytes present in CRM CZ 70006 - analyte contents were derived (unless otherwise stated) from a minimum of 3 data sets

Other PCBs („markers“)			
Analyte	Mass fraction ¹⁾ , µg/kg	Analyte	Mass fraction ¹⁾ , µg/kg
PCB 28	26.3	PCB 153	153.0
PCB 52	14.6	PCB 170	64.8
PCB 101	49.3	PCB 180	123.0
PCB 138	115.0		

1) Dry mass at 105 °C

Non-certified values of some other analytes present in CRM CZ 70006 - analyte contents were derived (unless otherwise stated) from a minimum of 3 data sets

Metals			
Analyte	Mass fraction ¹⁾ [mg/kg ²⁾]	Analyte	Mass fraction ¹⁾ [mg/kg ²⁾]
Ag	6.75	Se	1.41
As	17.3	Sn	15.2
Be	0.82	Tl	0.17
Cd	1.47	V	39.5
Co	16.8	Zn	782
Cr	498	Al	(19,800) ³⁾
Cu	318	Ca	(98,200)
Hg	1.48	Fe	(21,500)
Mn	1,410	K	(5,650)
Mo	4.15	Mg	(4,940)
Ni	41.2	Na	(5,470)
Pb	174		

1) Dry mass at 105 °C

2) Aqua regia extraction according to ISO 11885

3) Informative analyses only from 2 labs

Quality control materials METRANAL®

METRANAL® 1			Packing: 80 g	
River sediment 1 (metals)				
Analyte	Total sample decomposition		Aqua regia extraction¹⁾	
	Concentration (mg/kg)²⁾	Uncertainty (mg/kg)³⁾	Concentration (mg/kg)²⁾	Uncertainty (mg/kg)³⁾
Ag	3.10	0.38	2.50	0.32
As	29	2	24.1	3.2
Ba	522	104	275	22
Be	2.65	0.80	1.58	0.32
Bi	0.72	0.14	0.69	0.14
Cd	3.10	0.68	2.66	0.54
Co	15.6	1.4	12.5	1.5
Cr	118	12	93	14
Cu	97	10	91.2	8.0
Hg	1.3	0.1	1.19	0.15
Mn	1,370	140	1,330	106
Mo	1.13	0.12	0.97	0.02
Ni	45.0	8.2	35.4	5.0
Pb	93.2	10.0	82.4	16.4
Sb	2.52	0.50	1.73	0.34
Se	1.02	0.20	0.74	0.14
Sn	8.75	1.74	7.37	1.48
V	73.0	10.2	43.2	5.6
Zn	520	68	465	64
1) According to ISO 11466 (1995) 2) Dry mass at 105 °C 3) Expanded combined uncertainty (k=2)				
Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.				

METRANAL® 3			Packing: 25 g		
Strawberry leaf (metals)					
Analyte	Concentration (mg/kg)¹⁾	Uncertainty (mg/kg)²⁾	Analyte	Concentration (mg/kg)¹⁾	Uncertainty (mg/kg)²⁾
Al	1,120	110	K	21,200	2,100
As	0.26	0.06	Li	0.69	0.14
Ba	124	24	Mg	4,210	420
Ca	15,500	1,540	Mn	187	18
Cd	0.18	0.01	Ni	2.68	0.16
Cr	1.70	0.34	Pb	1.88	0.22
Cu	8.68	0.76	Sr	77	16
Fe	912	90	Zn	27.1	1.8
Hg	0.038	0.008			
1) Dry mass at 105 °C 2) Expanded combined uncertainty (k=2)					
Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.					

METRANAL® 6

Packing: 60 g

Sewage sludge 1 (metals)

Analyte	Total sample decomposition		Aqua regia extraction ¹⁾	
	Concentration (mg/kg) ²⁾	Uncertainty (mg/kg) ³⁾	Concentration (mg/kg) ²⁾	Uncertainty (mg/kg) ³⁾
Ag	55	4	52	4
As	9.0	1.5	8.6	1.1
Be	0.90	0.22	0.55	0.10
Cd	6.1	0.4	6.3	0.4
Co	15	2	8.2	1.4
Cr	106	12	90	12
Cu	340	18	376	30
Hg	4.74	0.34	4.25	0.55
Mn	550	30	530	40
Ni	60	8	49	8
Pb	104	6	100	12
Sn	29	2	25	2
V	38	4	22	2
Zn	1,220	60	1,125	60

1) According to ISO 11466 (1995)

2) Dry mass at 105 °C

3) Expanded combined uncertainty (k=2)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 8

Packing: 20 g

Green algae (metals)

Analyte	Concentration (mg/kg) ¹⁾	Uncertainty (mg/kg) ²⁾	Analyte	Concentration (mg/kg) ¹⁾	Uncertainty (mg/kg) ²⁾
As	41	3	Hg	0.017	0.010
Ca	1,380	80	Mg	1,580	120
Cd	0.023	0.004	Mn	43.0	3.4
Co	18.0	1.6	Ni	0.8	0.1
Cu	34.0	1.6	Pb	0.21	0.01
Fe	290	20	Zn	38	3

1) Dry mass at 105 °C

2) Expanded combined uncertainty (k=2)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 9

Packing: 50 g

Industrial sandy-loam soil (metals)

Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾	Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾
As	16.2	1.6	Hg	0.08	0.01
Ba	174	14	Mn	511	45
Be	2.01	0.20	Mo	1.4	0.1
Ca	5,561	450	Ni	40.0	2.5
Cd	1.3	0.1	Pb	33.3	2.9
Co	12.30	0.12	Sn	< 5	-
Cr	106	7	V	49.9	3.8
Cu	26.0	1.8	Zn	114	5

1) Dry mass at 105 °C

2) Expanded combined uncertainty (k=2)

3) Aqua regia extractable content according to ISO 11466 (1995)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 14

Packing: 60 g

River sediment RS-01-2 (metals)

Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾	Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾
Ag	2.00	0.12	Mn	400	32
As	27.6	1.5	Mo	2.30	0.28
Ba	221	26	Ni	24.9	0.7
Be	0.63	0.05	Pb	93.2	2.8
Ca	6,325	430	Sb	5.31	0.55
Cd	1.49	0.08	Se	0.94	0.10
Co	6.00	0.42	Sn	5.30	0.55
Cr	36.6	1.5	V	21.3	1.9
Cu	127	4	Zn	600	21
Hg	8.67	0.26			

1) Dry mass at 105 °C

2) Expanded combined uncertainty (k=2)

3) Aqua regia extractable content according to ISO 11466 (1995)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 17

Packing: 3 x 15 g

Set of three environmental samples (soil, sewage sludge, fly ash) for the determination of mercury from solid samples

Analyte	Hg-Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾
Sandy soil	0.044	0.002
Sewage sludge	4.68	0.40
Fly ash	1.12	0.03

1) Dry mass at 40 °C

2) Expanded combined uncertainty (k=2)

3) Total element content

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 18

Packing: 40 g

Pond sediment RS-01-2 (metals)

Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾	Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾
Ag	2.00	0.14	Mg	0.98	0.05
As	35.0	2.9	Mn	375	12
Ba	64.9	12.0	Ni	32.6	3.9
Be	1.7	0.1	Pb	170	4
Ca	57,276	335	Sn	13.7	0.3
Cd	2.2	0.1	V	56.6	7.0
Co	11.8	1.0	Zn	920.0	30.0
Cr	48.3	2.5	Sulfate (water soluble)	4,100	88
Cu	98.2	3.1	Chloride (water soluble)	280	5

1) Dry mass at 105 °C

2) Expanded combined uncertainty (k=2)

3) Aqua regia extractable content according to ISO 11466 (1995)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 20

Packing: 40 g

Sewage sludge SS-02 (metals)

Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾	Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾
Ag	9.45	0.13	Mo	4.47	0.51
As	18.3	0.5	Ni	48.3	1.1
Be	0.91	0.03	Pb	221	6
Cd	1.45	0.04	Sn	14.4	0.3
Co	24.2	1.6	V	49.2	0.3
Cr	645	14	Zn	937	16
Cu	348	7	Sulfate (water soluble)	11,520	152
Hg	53.6	1.1	Chloride (water soluble)	2,230	57
Mn	1,580	110	Fluoride (water soluble)	32.2	1.0

- 1) Dry mass at 105 °C
2) Half width of the 95% confidence interval
3) Aqua regia extractable content according to ISO 11466 (1995)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 22

Packing: 40 g

Industrial polluted land (metals)

Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾	Analyte	Concentration (mg/kg) ¹⁾³⁾	Uncertainty (mg/kg) ²⁾
As	34.0	0.8	Ni	32.0	0.9
Ba	148	4	Pb	44.3	2.1
Be	3.31	0.05	Se	< 2	-
Ca	4,660	135	Sn	4.83	0.29
Cd	0.47	0.01	V	50.1	1.2
Co	15.0	0.4	Zn	149	4
Cr	44.6	2.5	Sulfate (water soluble)	8,568	51
Cu	57.9	0.7	Chloride (water soluble)	165	2
Mn	416	7	Fluoride (water soluble)	3.32	0.05
Mo	4.50	0.18			

Analyte	Concentration (%) ¹⁾³⁾	Uncertainty (%) ²⁾
Loss on ignition, LOI (440 °C)	8.12	0.03
Dry residue (40 °C)	98.42	0.05
Dry residue (105 °C)	97.34	0.05

- 1) Dry mass at 105 °C
2) Half width of the 95% confidence interval
3) Aqua regia extractable content according to ISO 11466 (1995)

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 31

Packing: 80 g

Light sandy soil (metals), normal analyte levels

Element	Total element content (mg/kg, dry weight) ²⁾	Extract by aqua regia ¹⁾ (mg/kg, dry weight) ²⁾	Extract by boiling 2 mol/l HNO ₃ (mg/kg, dry weight) ²⁾	Extract by cold 2 mol/l HNO ₃ (mg/kg, dry weight) ²⁾
	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾
As	12.3	10.4 ± 1.0	5.92 ± 0.67	2.32 ± 0.36
Ba	970	108	76	68
Be	3.32 ± 0.26	1.02 ± 0.10	0.71 ± 0.04	0.52 ± 0.05
Cd	0.32 ± 0.05	0.29 ± 0.04	0.22 ± 0.04	0.18 ± 0.02
Co	9.66 ± 0.61	9.15 ± 0.47	8.44 ± 0.65	5.19 ± 0.21
Cr	89.6 ± 4.2	71.9 ± 5.9	48.5 ± 4.5	23.6 ± 2.1
Cu	30.8 ± 0.9	28.9 ± 0.8	24.10 ± 1.05	18.1 ± 0.5
Hg	0.087 ± 0.006	0.085	0.059	0.052
Mn	540 ± 20	479 ± 18	438 ± 26	357 ± 21
Ni	31.9 ± 1.6	31.8 ± 1.2	18.7 ± 1.2	10.0 ± 0.6
Pb	43.8 ± 3.7	24.1 ± 1.7	23.7 ± 1.4	20.7 ± 0.6
V	58.7 ± 6.3	52.0 ± 3.4	42.7 ± 4.2	21.0 ± 1.5
Zn	120 ± 7	108.0 ± 3.5	97.1 ± 2.9	58 ± 3

1) Aqua regia extractable content according to ISO 11466 (1995)

2) Dry mass at 105 °C

3) The half-width of a 95% confidence interval

Element	Matrix composition (% of the oxides, dry weight)	Element	Matrix composition (% of the oxides, dry weight)
SiO ₂	65.06	K ₂ O	3.16
Al ₂ O ₃	15.41	Na ₂ O	2.35
CaO	1.50	P ₂ O ₅	0.34
MgO	1.27	TiO ₂	0.52
Fe ₂ O ₃	4.73	Loss on ignition at 900 °C	5.1

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.



METRANAL® 32

Packing: 80 g

Light sandy soil (metals), elevated analyte levels

Element	Total element content (mg/kg, dry weight) ²⁾	Extract by aqua regia ¹⁾ (mg/kg, dry weight) ²⁾	Extract by boiling 2 mol/l HNO ₃ (mg/kg, dry weight) ²⁾	Extract by cold 2 mol/l HNO ₃ (mg/kg, dry weight) ²⁾
	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾
As	32.4 ± 1.9	26.1 ± 1.1	15.1 ± 2.1	6.12 ± 0.83
Ba	987	99.1	-	67.3
Be	8.77 ± 0.32	2.83 ± 0.15	1.94 ± 0.09	1.40 ± 0.11
Cd	0.31 ± 0.04	0.28 ± 0.03	0.26 ± 0.03	0.21 ± 0.02
Co	12.6 ± 0.9	11.1 ± 0.5	10.2 ± 0.6	6.64 ± 0.30
Cr	179 ± 8	147 ± 8	121 ± 11	62.9 ± 6.1
Cu	29.3 ± 0.6	27.3 ± 0.7	23.8 ± 1.1	19.8 ± 0.5
Hg	0.090 ± 0.012	0.080	0.046 ± 0.005	0.041
Mn	587 ± 37	531 ± 19	481 ± 31	425 ± 22
Ni	42.0 ± 1.7	40.1 ± 1.2	33.7 ± 2.0	16.0 ± 1.4
Pb	58.9 ± 4.9	35.5 ± 0.9	34.1 ± 1.8	30.6 ± 1.1
V	54.9 ± 6.8	44.6 ± 3.4	37.7 ± 3.1	21.3 ± 1.7
Zn	69.0 ± 7.7	64.0 ± 1.5	58.1 ± 2.2	34.2 ± 2.0

1) Aqua regia extractable content according to ISO 11466 (1995)

2) Dry mass at 105 °C

3) The half-width of a 95% confidence interval

Element	Matrix composition (% of the oxides, dry weight)	Element	Matrix composition (% of the oxides, dry weight)
SiO ₂	66.21	K ₂ O	5.20
Al ₂ O ₃	14.02	Na ₂ O	1.45
CaO	1.20	P ₂ O ₅	0.54
MgO	1.90	TiO ₂	0.45
Fe ₂ O ₃	3.77	Loss on ignition at 900 °C	5.21

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 33

Packing: 80 g

Clay loam soil (metals), normal analyte levels

Element	Total element content (µg/g, dry weight) ²⁾	Extract by aqua regia ¹⁾ (µg/g, dry weight) ²⁾	Extract by boiling 2 mol/l HNO ₃ (µg/g, dry weight) ²⁾	Extract by cold 2 mol/l HNO ₃ (µg/g, dry weight) ²⁾
	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾
As	16.7	11.6 ± 0.7	3.58	1.30 ± 0.19
Ba	495	146	101	93.6
Be	2.18 ± 0.16	1.29 ± 0.13	0.95 ± 0.02	0.69 ± 0.05
Cd	0.32 ± 0.04	0.32 ± 0.03	0.27 ± 0.04	0.23 ± 0.01
Co	11.5 ± 0.7	10.3 ± 0.5	8.31 ± 0.46	5.90 ± 0.25
Cr	79.8 ± 6.7	42.4 ± 3.6	23.8 ± 2.3	9.06 ± 0.67
Cu	29.1 ± 0.8	25.4 ± 0.9	20.6 ± 1.2	15.8 ± 0.3
Hg	0.096 ± 0.014	0.093	0.054 ± 0.008	0.040
Mn	600 ± 37	529 ± 19	476 ± 28	435 ± 19
Ni	31.3 ± 1.5	28.8 ± 1.2	22.2 ± 1.1	11.9 ± 0.6
Pb	33.5 ± 2.4	25.2 ± 1.1	22.7 ± 1.3	19.3 ± 0.4
V	76.2 ± 6.4	52.9 ± 2.7	25.3 ± 2.8	11.4 ± 0.7
Zn	81.0 ± 7.6	69.4 ± 1.8	54.2 ± 2.3	24.4 ± 0.9

1) Aqua regia extractable content according to ISO 11466 (1995)

2) Dry mass at 105 °C

3) The half-width of a 95% confidence interval

Element	Matrix composition (% of the oxides, dry weight)	Element	Matrix composition (% of the oxides, dry weight)
SiO ₂	68.80	K ₂ O	2.21
Al ₂ O ₃	12.30	Na ₂ O	0.74
CaO	1.38	P ₂ O ₅	0.16
MgO	1.02	TiO ₂	0.68
Fe ₂ O ₃	4.15	Loss on ignition at 900 °C	8.60

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.

METRANAL® 34

Packing:

80 g

Loam (metals), elevated analyte levels

Element	Total element content (mg/kg, dry weight) ²⁾	Extract by aqua regia ¹⁾ (mg/kg, dry weight) ²⁾	Extract by boiling 2 mol/l HNO ₃ (mg/kg, dry weight) ²⁾	Extract by cold 2 mol/l HNO ₃ (mg/kg, dry weight) ²⁾
	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾	Mean ± Unc. ³⁾
As	49.6 ± 3.0	42.4 ± 2.2	27.1 ± 2.9	16.4 ± 1.8
Ba	568	217	-	142
Be	4.17 ± 0.18	2.69 ± 0.21	2.17 ± 0.06	1.84 ± 0.08
Cd	1.52 ± 0.15	1.44 ± 0.07	1.44 ± 0.07	1.36 ± 0.01
Co	20.0 ± 1.3	17.5 ± 0.9	12.5 ± 0.6	9.42 ± 0.38
Cr	82.2 ± 6.3	46.3 ± 3.8	27.3 ± 2.0	14.6 ± 1.1
Cu	183 ± 5	167 ± 1	159 ± 5	137 ± 4
Hg	0.223 ± 0.016	0.21	0.16	0.094 ± 0.014
Mn	869 ± 34	741 ± 36	572 ± 35	527 ± 24
Ni	33.3 ± 1.1	30.4 ± 1.2	21.4 ± 0.9	13.0 ± 0.7
Pb	93.4 ± 3.4	83.1 ± 2.3	82.6 ± 1.9	71.7 ± 2.5
V	126 ± 7	95.1 ± 4.9	48.9 ± 4.3	29.9 ± 2.3
Zn	227 ± 7	198 ± 6	169 ± 8	119 ± 5

1) Aqua regia extractable content according to ISO 11466 (1995)

2) Dry mass at 105 °C

3) The half-width of a 95% confidence interval

Element	Matrix composition (% of the oxides, dry weight)	Element	Matrix composition (% of the oxides, dry weight)
SiO ₂	64.35	K ₂ O	2.55
Al ₂ O ₃	13.10	Na ₂ O	0.72
CaO	2.07	P ₂ O ₅	0.45
MgO	1.29	TiO ₂	1.32
Fe ₂ O ₃	5.82	Loss on ignition at 900 °C	7.87

Ask for up-to-date Identification sheet. Materials are periodically retested, hence data may change in time.



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