CERTIFICATE

Aqueous calibration solution ASTASOL®

This Certificate is designed in accordance with ISO Guide 31

Category: **Certified reference material**

Analyte: **Silicon (Si)**

Product code: **AN 7053 (F)**

Starting primary compound and its purity: $(NH_4)_2SiF_6$ 99.99%

Matrix:

0.05% HF (v/v), prepared from sub boil distilled HF (ANALPURE®) and ultrapure demineralized water (resistivity ≥ 18MΩ.cm, 0.22μm filtered)

Density and its expanded uncertainty (k = 2): 0.9981 ± 0.0005 g/cm^3 (at 20 °C)

Certified value of concentration and its expanded uncertainty (k = 2) at 20 °C

10.00 ± 0.05 mg/l

10.02 ± 0.07 mg/kg*

*Mass fraction in mg/kg is derived from density

Specification:

Batch No.: 7003

The date of production: 02.06.2020

Shelf life: 2 years from the date of production

The date of first opening of the bottle: ……

Expiry date:……12 months from the first opening of the bottle within shelf life period, which should be indicated on the label of the bottle as well.

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 and selected electroanalytical methods.

Certification and traceability:

This CRM is certified on the basis of gravimetric preparation. This procedure also ensures a direct traceability to SI unit – kg.

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
<0,01	<0,002											< 0,1	N.A	N.A	M	M
Na	Mg											Al	Si	P	S	Cl
<0,01	<0,005											<0,01	A	<0,1	<0,5	N.A
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br
<0,02	<0,05	<0,05	<0,01	<0,01	<0,01	<0,005	<0,01	<0,02	<0,02	<0,01	<0,02	<0,1	<0,02	<0,01	<0,1	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	<0,02	<0,01	<0,004	<0,05	<0,01	<0,01	<0,1	N.A
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi		
<0,05	<0,01	<0,05	<0,1	<0,05	<0,05	<0,02	<0,1	<0,1	<0,02	<0,02	<0,001	<0,1	<0,01	<0,01		

Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
<0,5	<0,1	<0,05	<0,02	<0,01	<0,1	<0,05	<0,05	<0,1	<0,05	<0,01	<0,01	<0,02

Th	U
<0,1	<0,1

M = matrix N.A = not analysed < x = bellow 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 it kept under conditions presented bellow.

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.
It is necessary to indicate the expiration time, which depends on the date of the first time the bottle was opened. It is important to cover the screw cap and the neck of the bottle with a parafilm layer after each opening to prevent vapour phase losses. It is not recommended to use the standard solution when the bottle contains less than 10 % of the solution. Therefore, in case of nontransparent bottle, it is important to indicate the amount of the solution used, e.g. on the label. Do not pippette from the bottle. Do not return removed aliquots to bottle.

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:

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Quality management systems:

ČSN EN ISO 9001:2016
ČSN EN ISO/IEC 17025:2018
ČSN EN ISO 17034:2017

R 7501

Analytika, spol. s r.o., Department of RM, Reference Materials Producer No. 7501 accredited by CAI according to ČSN EN ISO 17034:2017

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