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CERTIFICATE OF ANALYSIS

Product: Standard Solution of: Calcium (Ca)
concentration 1.000 g/l in 2% Nitric Acid
(HNO₃) Batch 18912701

CA0181 Quality Release Date 17.05.2018
Expiry Date: 05.2021

Analysis	Batch Value (mg/l)	Specifications (mg/l)
concentration (Ca)	1003.9 ± 2.7 ^(y)	1000

Density: 1.018 g/cm³ at 20 °C

Preparation

This certified reference material is produced in a clean room, using a highest purity starting material, acid from sub-boiling and 0.055 µS/cm deionized water. The low-density polyethylene bottle was decontaminated by leaching with 0.055 µS/cm deionized water and triple rinse.

The instructions of ISO 17034 were considered for the preparation of this solution.

Contains: CaCO₃ 99.998%

Traceability

This standard is traceable to NIST SRM No 3109a Lot 130213; NIST SRM No 3168a Lot 120629 The certified value was obtained by a weighted mean of the results of two independent methods among: Classical Volumetric, Primary Gravimetric, Instrumental (ICP/OES, ICP/MS or IC) according to calibration procedure (y) WQP 5.15.1.24

The calibration curve is drawn using a series of standard solutions prepared from a certified reference material traceable to NIST (SRM) and accredited by laboratories/producers in compliance with ISO/IEC 17025 and/or ISO 17034.

Uncertainty

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor K=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA 4/02

Measurement

Batch value certified at the time of measurement.

The certified value is calculated by means of both gravimetric preparation and ICP-OES analysis.

Hazardous

The normal laboratory safety precautions should be observed when working with this standard.

Please refer to Safety Data Sheet (SDS) to further details.

Homogeneity

This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

To ensure sufficient homogeneity of the sample prior to use, mix thoroughly by shaking.

Storage and use

For ICP spectrometer calibration.

If stored unopened in the original packaging, this solution is stable for 3 years from the release date. Shelf life is also limited by the effect of transpiration of solvent through the unopened bottle walls at an average of <0.1% per year. Once the bottle is opened, keep tightly closed at room temperature in the original packaging. Do not pipette directly from the bottle. Do not pour the used solution back in the bottle. This standard can be used directly or can be diluted in an appropriate high-purity matrix. Obtained concentration (in mg/l) after dilution is a result from the multiplication of certified value of standard concentration and the volume used for dilution and divided into the final volume used for dilution.

We recommend that the material used be leached with acids.
We suggest rejecting the solution six months after opening.

This document is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31, ISO Guide 35 and Eurachem/CITAC Guides.
The product is produced by laboratory accredited to ISO 17034 and ISO/IEC 17025

Signature:  (M. Canet)

This certificate does not release the user from their control upon receipt of the goods. You can get a copy of any of our COA from our website: www.scharlab.com

Trace impurities in the actual solution reported in ppm:

(all values below are nominal and not certified)

Ag	0.02
Al	<0.0018
As	<0.016
Au	<0.016
B	0.004
Ba	<0.0005
Be	<0.0001
Bi	<0.016
Ca	*
Cd	<0.0012
Ce	<0.0085
Co	<0.0028
Cr	<0.0014
Cs	<0.05

Cu	<0.0009
Dy	<0.0054
Er	<0.0035
Eu	<0.0039
Fe	0.003
Ga	<0.020
Gd	<0.0028
Ge	<0.020
Hf	<0.0032
Hg	<0.024
Ho	<0.0053
In	<0.098
Ir	<0.0061
K	<0.0095

La	<0.0024
Li	<0.0001
Lu	<0.0062
Mg	0.02
Mn	<0.001
Mo	<0.0024
Na	<0.007
Nb	<0.0066
Nd	<0.0058
Ni	0.002
P	0.01
Pb	<0.021
Pd	<0.033
Pr	<0.0046

Pt	<0.0097
Rb	<0.063
Re	<0.0081
Rh	<0.0038
Ru	<0.0089
S	0.03
Sb	<0.020
Sc	<0.0016
Se	<0.023
Si	<0.037
Sm	<0.0058
Sn	<0.050
Sr	<0.00006
Ta	<0.004

Tb	<0.022
Te	<0.031
Th	<0.014
Ti	<0.0012
Tl	<0.028
Tm	<0.0023
U	<0.45
V	<0.0018
W	<0.017
Y	<0.0007
Yb	<0.0003
Zn	0.003
Zr	<0.0007