



**Scharlab S.L.**

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## CERTIFICATE OF ANALYSIS

Product: Standard Solution of: Cd 100mg/l; Cr 100mg/l; Co 100mg/l; Cu 100mg/l; Pb 100mg/l; Mn 100mg/l; Ni 100mg/l; V 100mg/l; Zn 100mg/l; Matrix: 5% HNO<sub>3</sub> Batch 17823401

Quality Release Date 27.02.2017

**MU0112**

Expiry Date: 02.2020

**Certified value/  
Uncertainty:**

**Element**

**Certified Value and  
Uncertainty [mg/l]:**

**Metrological traceability:**

Cd	100.10 ± 0.32 <sup>(y)</sup>	NIST SRM No 3108 Lot 130116
Cr	100.47 ± 0.27 <sup>(y)</sup>	NIST SRM No 3112a Lot 030730
Co	100.10 ± 0.26 <sup>(y)</sup>	NIST SRM No 3113 Lot 000630
Cu	100.13 ± 0.25 <sup>(y)</sup>	NIST SRM No 3114 Lot 121207
Pb	100.25 ± 0.66 <sup>(y)</sup>	NIST SRM No 3128 Lot 101026
Mn	100.67 ± 0.28 <sup>(y)</sup>	NIST SRM No 3132 Lot 050429
Ni	100.46 ± 0.32 <sup>(y)</sup>	NIST SRM No 3136 Lot 120619
V	99.96 ± 0.34 <sup>(y)</sup>	NIST SRM No 3165 Lot 992706
Zn	99.51 ± 0.35 <sup>(y)</sup>	NIST SRM No 3168a Lot 120629

Density: 1.024 g/cm<sup>3</sup> 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 high purity acids, 0.055 µS/cm deionized water and triple rinse. The instructions of ISO Guide 34 were considered for the preparation of this solution.

Contains:

Cd 99.999%	50 : Cd[Cd] :5N : T- : 5 : O01
Cr(NO <sub>3</sub> ) <sub>3</sub> 99.999%	50 : Cr[Cr(NO <sub>3</sub> ) <sub>3</sub> ] :2N : T- : 5 : O01
Co(NO <sub>3</sub> ) <sub>2</sub> 99.996%	30 : Co[Co(NO <sub>3</sub> ) <sub>2</sub> ] :8N : T- : 5 : O02
Cu 99.999%	60 : Cu[Cu] :10N : T- : 5 : O05
Pb(NO <sub>3</sub> ) <sub>2</sub> 99.999%	50 : Pb[Pb(NO <sub>3</sub> ) <sub>2</sub> ] :5N : T- : 5 : N04
Mn 99.99%	50 : Mn[Mn] :5N : T- : 4 : O05
Ni(NO <sub>3</sub> ) <sub>2</sub> 99.999%	50 : Ni[Ni(NO <sub>3</sub> ) <sub>2</sub> ] :5N : T- : 5 : O02
NH <sub>4</sub> VO <sub>3</sub> 99.996%	20 : V[NH <sub>4</sub> VO <sub>3</sub> ] :2N : T- : 46 : O04
Zn 99.99%	50 : Zn[Zn] :5N : T- : 4 : N07

### Traceability

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 Guide 34.

**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 Guide 34 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](http://www.scharlab.com)