RICCA CHEMICAL COMPANY®

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# Product Specification

CERTIFIED REFERENCE MATERIAL

## VeriSpec® Multi-Element Standard 18
## 100 ppm: Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se, Th, Tl, U, V, Zn
## Manufactured and Tes

**Lot Number:** SAMPLE **Product Number:** RV010676

**Manufacture Date:** N/A
**Expiration Date:** N/A

| Component | Certified Value | Uncertainty | Traceability |
|---|---|---|---|
| Ag | 100 ppm[(a)] | | |
| Al | 100 ppm[(a)] | | |
| As | 100 ppm[(a)] | | |
| Ba | 100 ppm[(a)] | | |
| Be | 100 ppm[(a)] | | |
| Cd | 100 ppm[(a)] | | |
| Co | 100 ppm[(a)] | | |
| Cr | 100 ppm[(a)] | | |
| Cu | 100 ppm[(a)] | | |
| Mn | 100 ppm[(a)] | | |
| Ni | 100 ppm[(a)] | | |
| Pb | 100 ppm[(a)] | | |
| Se | 100 ppm[(a)] | | |
| Th | 100 ppm[(a)] | | |
| Tl | 100 ppm[(a)] | | |
| U | 100 ppm[(a)] | | |
| V | 100 ppm[(a)] | | |
| Zn | 100 ppm[(a)] | | |

* Starting material purity is not a certified value.

**Matrix:** 5% $HNO_3$

| Analyte | Analysis (ppm) | Solute | CAS# | Grade | NIST SRM# |
|---|---|---|---|---|---|

**Method(s) of certification used:**

(a) *The certified value was obtained using IC or ICP-OES calibration*

**Concept of certification and traceability statement:**

This certified reference material is produced using a high-purity starting material, acid from sub-boiling and 18 MOhm deionized water. 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 Property of the result of a measurement whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties (ISO VIM) The metrological traceability is assured through calibration on ICP-OES, AAS. The calibration curve is drawn using a series of standard solutions prepared from a certified reference material traceable to SI of NIST (SRM) and of accredited according to ISO/IEC 17025 and/or ISO Guide 34 laboratories/producers. All contributions in relation to the certification of standard solutions are considered when evaluating the uncertainty. The measurement results are traceable to SI. All analytical balances used for the preparation of the solution are calibrated yearly under an in-house procedure with analytical weights, traceable to DKD and are daily checked. Class A laboratory glassware is used. The results from temperature measurement are traceable to SI. The thermometers used for solution's calibration are calibrated from an ISO 17025 accredited laboratory. The ambient conditions are controlled with a hygrometer calibrated from an ISO 17025 accredited laboratory.

## Level of homogeneity:

The solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.
To ensure sufficient homogeneity, mix thoroughly by inversion prior to each use.

## Intended use:

For Laboratory Use Only
This CRM is intended for:

- Calibration of ICP-OES, ICP-MS
- Validation of analytical methods
- Preparation of "working reference samples"
- Detection limit and linearity studies

This statement is not intended to restrict the use for other purposes.

## Instructions for the correct use of this reference material:

This certified reference material can be used directly or can be diluted in an appropriate high-purity matrix. Only clean class A glassware should be used. Do not pipet from container. Obtained concentration (in mg/l) after dilution is a result from the multiplication of certified value of CRM concentration and the CRM's volume used for dilution and divided into the flask's volume used for dilution.

## Hazardous situation:

The normal laboratory safety precautions should be observed when working with this certified reference material. Refer to the Safety Data Sheet for detailed information on hazards associated with this material.

| Part Number | Size / Package Type | Shelf Life (Unopened Container) |
|---|---|---|
| RV010676-100N | 100 mL natural LDPE | 36 months |

**Recommended Storage:** 15°C - 30°C (59°F - 86°F)

This Certified Reference material was produced under a quality management system that is accredited to ISO/IEC 17025 and ISO 17034.

This Certificate of Analysis shall not be reproduced, except in full, without the written approval of Ricca Chemical Company.