

CERTIFICATE

ULTRASPEC® CERTIFICATE OF REFERENCE MATERIAL

Catalog Number: 500MUL13-100

Description: ULTRASPEC Multi-Element Aqueous CRM.

Matrix: 5% HNO₃

Expiration Date: May 2021.

Lot No: SAPI20-05-20US

Order #: 2101015873

Inv. #: 107783

This ULTRASPEC® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP-OES, DCP, AA, ICP-MS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentration.

Individual Concentration Levels:

Element	Concentration (µg/mL)	NIST SRM
Al	100 ±0.30	3101
Ba	100 ±0.30	3104
Be	100 ±0.30	3105
Cd	100 ±0.30	3108
Cr	100 ±0.30	3112
Co	100 ±0.30	3113
Cu	100 ±0.30	3114

Element	Concentration (µg/mL)	NIST SRM
Fe	100 ±0.30	3126
Mn	100 ±0.30	3132
Ni	100 ±0.30	3136
Pb	100 ±0.30	3128
Sr	100 ±0.30	3153
Zn	100 ±0.30	3168

Certified by: _____

Jan D. De Bruyn, Chemist

Certification Date: 20 May, 2020.

This ICP-AES & ICP-MS Standard is guaranteed to be stable and accurate to within plus or minus 0.3% of the actual concentration up to the expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions.

For these solutions, 18 megaohm/cm double deionized water, high-purity acids, Class A glassware and acid-cleaned bottles are used. A Material safety Data Sheet is available upon request..

Manufactured by: DE BRUYN SPECTROSCOPIC SOLUTIONS
P.O. Box 71651
Bryanston, 2021

Tel: 011 465 9660
Fax: 086 530 3357
Cell: 082 354 7730

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilutions is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come into contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles (where appropriate), and Class A/calibrated volumetrics have been used in all preparations.

Homogeneity:

The homogeneity of the CRM has been confirmed by procedures consistent with ISO 17025:2005, ISO Guide 34:2009, and ASTM D D6362-98 Appendix X2. Random, replicate samples of final, packaged material have been analyzed to prove homogeneity in accordance with our internal procedure -----.

Since the procedure is highly homogeneous, any sample size taken for analysis would be within the uncertainty budget. This is consistent with the intended use of the CRM.

V6
h