Certificate of Analysis

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STOCK STANDARD SOLUTION IV-DI-BLANK

Deionized Water

TRACEABILITY DOCUMENTATION FOR STANDARD SOLUTION - Lot No: V2-MEB741281

We use 18.3 megohm-deionized water & deionized water rinsed LDPE bottles, with a less than 0.5 ppb total impurities in the manufacturing of this ICP standard. We always use “in-house calibration checked” Class A Glassware. All balances are checked daily using in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

ANALYZED DENSITY OF SOLUTION (measured at 20 ± 4° C): 0.998 g/mL

TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm. The following data is representative of an analysis for a typical blank solution.

M	Al	<	0.00010	M	Sb	<	0.00001	M	As	<	0.00010	M	Ba	<	0.00010	M	Be	<	0.00001
M	Bi	<	0.00001	M	B	<	0.00070	M	Cd	<	0.00003	M	Ca	<	0.00005	M	Ce	<	0.00005
M	Cs	<	0.00001	M	Cr	<	0.00005	M	Co	<	0.00003	M	Cu	<	0.00006	M	Dy	<	0.00006
M	Er	<	0.00005	M	Eu	<	0.00003	M	Gd	<	0.00001	M	Ga	<	0.00001	M	Ge	<	0.00006
M	Au	<	0.00003	M	Hf	<	0.00002	M	Ho	<	0.00001	M	In	<	0.00010	M	Ir	<	0.00005
M	Fe	<	0.00200	M	La	<	0.00001	M	Pb	<	0.00003	M	Li	<	0.00010	M	Lu	<	0.00001
M	Mg	<	0.00030	M	Mn	<	0.00004	M	Hg	<	0.00001	M	Mo	<	0.00002	M	Nd	<	0.00002
M	Ni	<	0.00008	M	Nb	<	0.00001	n	Os	<	0.00001	M	Pd	<	0.00005	M	P	<	0.00001
M	Pt	<	0.00002	M	K	<	0.00005	M	Pr	<	0.00001	M	Re	<	0.00001	M	Rh	<	0.00001
M	Rb	<	0.00001	M	Ru	<	0.00002	M	Sm	<	0.00001	M	Sc	<	0.00010	M	Se	<	0.00008
M	Si	<	0.00001	M	Ag	<	0.00002	M	Na	<	0.00005	M	Sr	<	0.00001	M	S	<	0.00001
M	Ta	<	0.00007	M	Te	<	0.00030	M	Tb	<	0.00001	M	Tl	<	0.00001	M	Th	<	0.00001
M	Tm	<	0.00001	M	Sn	<	0.00005	M	Ti	<	0.00050	M	W	<	0.00010	M	U	<	0.00002
M	V	<	0.00002	M	Yb	<	0.00001	M	Y	<	0.00040	M	Zn	<	0.00020	M	Zr	<	0.00005

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

THERMOMETER CALIBRATION

All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

Certification Date: February 14, 2024

Expiration Date: February 14, 2029

NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Uyen Truong, Custom Processing Supervisor

Certificate Approved By: Jodie Wall, Stock VSM Coordinator

Certifying Officer: Paul Gaines, Chairman / Senior Technical Director