



Reference Materials Producer  
Cert. #2495.01

# SPExertificate®

## Certificate of Reference Material



Chemical Testing  
Cert. #2495.02

**Catalog Number:** CLMS-2N  
**Description:** Multi-element Solution 2  
**Matrix:** 5% HNO<sub>3</sub>

**Lot No.** CL5-199MKBY

The **CLARITAS PPT®** 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 concentrations. See side 2 for details of certification.

### Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled	Certified	Uncertainty	SRM	Analyte	Labeled	Certified	Uncertainty	SRM
Ag	10 µg/mL	9.89 µg/mL	± 0.05 µg/mL	3151*	K	10 µg/mL	9.89 µg/mL	± 0.05 µg/mL	3141a*
Al	10 µg/mL	9.89 µg/mL	± 0.05 µg/mL	3101a*	Li	10 µg/mL	9.99 µg/mL	± 0.05 µg/mL	3129a*
As	10 µg/mL	9.92 µg/mL	± 0.05 µg/mL	3103a*	Mg	10 µg/mL	9.98 µg/mL	± 0.05 µg/mL	3131a*
Ba	10 µg/mL	9.98 µg/mL	± 0.05 µg/mL	3104a*	Mn	10µg/mL	9.99 µg/mL	± 0.05 µg/mL	3132*
Be	10 µg/mL	10.0 µg/mL	± 0.05 µg/mL	3105a*	Na	10 µg/mL	9.91 µg/mL	± 0.05 µg/mL	3152a*
Bi	10 µg/mL	9.97 µg/mL	± 0.05 µg/mL	3106*	Ni	10µg/mL	9.95 µg/mL	± 0.05 µg/mL	3136*
Ca	10 µg/mL	9.94 µg/mL	± 0.05 µg/mL	3109a*	Pb	10µg/mL	9.91 µg/mL	± 0.05 µg/mL	3128*
Cd	10 µg/mL	9.95 µg/mL	± 0.05 µg/mL	3108*	Rb	10 µg/mL	9.93 µg/mL	± 0.05 µg/mL	3145a*
Co	10 µg/mL	9.95 µg/mL	± 0.05 µg/mL	3113*	Se	10µg/mL	9.98 µg/mL	± 0.05 µg/mL	3149*
Cr	10 µg/mL	9.93 µg/mL	± 0.05 µg/mL	3112a*	Sr	10 µg/mL	9.97 µg/mL	± 0.05 µg/mL	3153a*
Cs	10 µg/mL	10.0 µg/mL	± 0.05 µg/mL	3111a*	Tl	10µg/mL	9.88 µg/mL	± 0.05 µg/mL	3158*
Cu	10 µg/mL	10.0 µg/mL	± 0.05 µg/mL	3114*	U	10 µg/mL	10.0 µg/mL	± 0.05 µg/mL	3164*
Fe	10 µg/mL	10.3 µg/mL	± 0.05 µg/mL	3126a*	V	10µg/mL	9.99 µg/mL	± 0.05 µg/mL	3165*
Ga	10 µg/mL	10.0 µg/mL	± 0.05 µg/mL	3119a*	Zn	10µg/mL	10.0 µg/mL	± 0.05 µg/mL	3168a*
In	10 µg/mL	9.87 µg/mL	± 0.05 µg/mL	3124a*					

\* - Indicates NIST SRM

† - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

SPEX CertiPrep Reference Multi: Lot #CL3-151MKB, CL4-108MKB

### Trace Metallic Impurities in the Actual Solution via ICP-MS Analysis:

Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L
Au	< 0.04	Ge	< 0.7	Mo	0.2	Re	< 0.01	Sm	0.9
B	< 2	Hf	< 0.08	Nb	< 0.06	Rh	0.7	Sn	< 0.9
Ce	0.1	Hg	< 0.2	Nd	< 0.01	Ru	< 1	Ta	< 0.1
Dy	< 0.01	Ho	< 0.01	P	< 200	Sb	< 0.04	Tb	< 2
Er	< 0.01	Ir	0.08	Pd	< 5	Sc	< 0.4	Te	< 1
Eu	< 0.01	La	0.07	Pr	< 0.01	Si	< 200	Th	0.01
Gd	< 0.02	Lu	< 0.02	Pt	< 0.01			Zr	< 0.1

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to ± 0.5% of the certified value. This includes uncertainty components due to preparation, measurement, homogeneity, short-term and long-term stability. No measured concentration of any individual component exceeds ± 2% of the labeled value. This guarantee is valid for a period of one year from the date of certification only when the material is unopened and stored under ambient laboratory conditions.

Date of Certification: \_\_\_\_\_

Certifying Officer: \_\_\_\_\_

*Katherine Cullinan*

Katherine Cullinan, QC Manager