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Certificate of Analysis

Trace Metals QC CRM

Catalog Number: QCI-016-1 (Ampule 1)

Lot Number: D0425

Manufacture Date: 03/05/25

Certified Date: 03/05/25

Expiration: 03/31/2027

Solvent: 5% Nitric Acid

Hazards: Irritant, Corrosive

<u>Analyte</u>	<u>Study Mean</u> (ug/L)	<u>Certified Concentration</u> (ug/L)	<u>Acceptance Limits</u> (ug/L)
Antimony	21.7	23.0 ± 0.214	16.1 - 29.9
Arsenic	32.1	32.7 ± 0.304	22.9 - 42.5
Barium	1747	1840 ± 17.1	1560 - 2120
Beryllium	6.14	6.00 ± 0.056	5.10 - 6.90
Cadmium	36.6	37.6 ± 0.350	30.1 - 45.1
Chromium	16.3	16.0 ± 0.149	13.6 - 18.4
Copper	90.5	90.0 ± 0.838	81.0 - 99.0
Lead	27.0	27.0 ± 0.251	18.9 - 35.1
Nickel	266	270 ± 2.51	230 - 311
Selenium	14.1	14.0 ± 0.130	11.2 - 16.8
Thallium	6.45	6.50 ± 0.061	4.55 - 8.45
Vanadium	83.7	81.0 ± 0.754	68.9 - 93.2

This quality control CRM was manufactured and certified by NSI Lab Solutions following quality procedures meeting the requirements of ISO/IEC 17034:2016 and ISO/IEC 17025:2017. Our certificates and scopes of accreditation may be viewed at www.anab.org. Acceptance limits are set at current NELAC standards. The study mean is set at the mean of an interlaboratory proficiency testing study with outlier rejection. This CRM is intended to be used to validate analytical methods, for detection limit studies, and analyst proficiency testing.

Storage & Instructions For Use

The unopened ampule can be stored at room temperature (15-30°C).

Shake each ampule well to redissolve any precipitate that may have formed

Fill a 1000 mL Class A volumetric flask with about 500 mL of reagent water.

Add appropriate amount of trace metals grade nitric acid to the flask to match the matrix of your calibration standards or to meet other requirements.

Pipet exactly 10.0 mL of the concentrate from Ampule 1 (QCI-016-1) into the flask.

Bring the flask to volume with reagent water and mix well.

This represents the sample for analysis.



ISO 9001:2015 UL Registered Firm - Certificate # 10002343 QM15

**Catalog Number:** QCI-016-2 (Ampule 2)**Lot Number:** D0425**Manufacture Date:** 03/05/25**Certified Date:** 03/05/25**Expiration:** 03/31/2027**Solvent:** 5% Nitric Acid**Hazards:** Irritant, Corrosive

<u>Analyte</u>	<u>Study Mean</u> (ug/L)	<u>Certified Concentration</u> (ug/L)	<u>Acceptance Limits</u> (ug/L)
Aluminum	374	375 ± 3.49	319 - 431
Boron	1416	1420 ± 13.2	1210 - 1630
Iron	1346	1350 ± 12.6	1150 - 1550
Lithium	38.8	39.7 ± 0.370	21.8 - 57.6
Manganese	621	624 ± 5.81	530 - 718
Molybdenum	42.7	42.0 ± 0.391	35.7 - 48.3
Silver	148	147 ± 1.37	103 - 191
Zinc	1657	1660 ± 15.5	1410 - 1910

Storage & Instructions For Use**The unopened ampule can be stored at room temperature (15-30°C).**

Shake each ampule well to redissolve any precipitate that may have formed

Fill a 1000 mL Class A volumetric flask with about 500 mL of reagent water.

Add appropriate amount of trace metals grade nitric acid to the flask to match the matrix of your calibration standards or to meet other requirements.

Pipet exactly 10.0 mL of the concentrate from Ampule 2 (QCI-016-2) into the flask.

Bring the flask to volume with reagent water and mix well.

This represents the sample for analysis.

Traceability Information**Analyte Source Materials:** All analytes and matrix materials are obtained and verified by NSI from pre-qualified vendors as per ISO guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of NSI CRMs are tracked and documented.**Balance:** All analytical balances are calibrated on a semiannual basis by an ISO/IEC 17025 accredited calibration laboratory and are traceable to NIST. Traceable Calibration Certificate available upon request.

All balances are checked daily by an in-house standard operating procedure. The weights used for this daily verification are calibrated annually by an ISO/IEC 17025 accredited calibration laboratory and are certified traceable to NIST. Certificate of Calibration and Traceability available upon request.

Thermometer: All thermometers are NIST traceable through thermometers that are calibrated annually by an ISO/IEC 17025 accredited calibration laboratory.**Glassware:** All glassware used in the manufacture of our samples is Class A. An in-house standard operating procedure is used to verify all glassware prior to it being placed into service. Volumetric pipetors are calibrated every four months by an ISO/IEC 17025 accredited calibration laboratory.

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Certified Concentration: Certified concentration is the made to manufacture value corrected for the determined analyte purity.

Intended Uses

- Calibration of analytical instruments
- Validation of analytical methods
- Preparation of working level reference materials, i.e. "check standards"
- Detection limit studies

Uncertainty

The $\pm$ uncertainty associated with the certified concentration is the expanded uncertainty at 95% confidence interval (CI) with K=2. This expanded uncertainty incorporates contributions from manufacturing, homogeneity, shipping, and stability.

Homogeneity

This quality control CRM was thoroughly mixed in production. Batch homogeneity was established through analyses of samples chosen at random.

Stability/Expiration

The stability of this quality control CRM is based on short-term and long-term monitoring of the certified concentration. The expiration date is guaranteed to be valid from the manufacture date and is based on results of long-term monitoring. Guarantee is applicable to the unopened bottle.

Ewart Morris

Ewart Morris, Inorganics Technical Manager

Quentisha Forrester

Quentisha Forrester, Quality Lead