



Certificate of Analysis

Product Name: Total Residual Chlorine Concentrate - 1.00 mg/L

Catalog Number: QCI-187

Lot Number: 200921

Manufacture Date: 09/21/20

Certified Date: 09/22/20

Expiration: 09/30/2022

Matrix: Water

Hazards: Irritant

(See MSDS)

<u>Analyte</u>	<u>Certified Concentration</u> (mg/L)
Total Residual Chlorine	1.00 ± 0.003
Residual Free Chlorine	0.946 ± 0.003

This certified reference material (CRM) is packaged in amber glass ampules. A 0.1 mL minimum sample size is recommended. Smaller sample volumes may negatively affect estimated uncertainty. This CRM was manufactured by NSI Lab Solutions following quality procedures meeting the requirements of ISO 9001, ISO 17025, and ISO 17034.

Storage & Instructions For Use

This solution must be stored at 2-8°C. Prepare for use while still cold. Keep away from light.

Prior to opening the ampule, mix contents gently by inversion 3-5 times.

Fill a 1000 mL Class A volumetric flask with about 950 mL of chlorine and organics free reagent water.

Carefully open the ampule and pipet exactly 1.00 mL of the concentrate into the flask using a Class A pipet.

Bring the flask to volume with chlorine and organics free reagent water and mix by inversion 10 times.

This represents your sample for immediate analysis by appropriate method.

Other dilution schemes of the same ratio are acceptable (i.e. 0.100 mL:100 mL).

Traceability Information

Analyte Source Materials: The highest purity analyte source materials are used in the manufacture of this CRM. The actual purity is referenced below. Analyte source material purity and associated uncertainty has been analytically verified against appropriate NIST SRMs, where available.

<u>Bulk Number</u>	<u>Description</u>	<u>CAS Number</u>	<u>Purity</u>
W-1418-29	Sodium hypochlorite solution	7681-52-9	100%

Method: Certified concentration confirmed by Hach against independent reference materials with n=10.

Balance: All analytical balances are calibrated on a semiannual basis by an ISO 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 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 17025 accredited calibration laboratory.



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



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Glassware: All glassware used in the manufacture of our CRMs 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 17025 accredited calibration laboratory.

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 gravimetric concentration is the expanded uncertainty at 95% confidence interval (CI) with K=2. This expanded uncertainty incorporates contributions from manufacturing, homogeneity, and stability.

Homogeneity

This CRM was thoroughly mixed in production. Batch homogeneity was established through analysis of ten samples chosen at random. A minimum 0.1 mL sample size is recommended.

Stability/Expiration

The stability of this 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.

Ewart Morris

Ewart Morris, Inorganics Technical Manager

Mark Hammersla

Mark Hammersla, President

