Certificate of Analysis

Product Type: Conductivity Calibration/Verification Standard
Catalogue Number: A-4700-060

Solution 100 –Aqueous Conductivity

Lot Number : A-1831501-36
Certified Value : 99.77 µS /cm± 0.07µS/cm at 25°C
Expanded Uncertainty: $U = \pm 0.07 \mu S/cm^2$
Source Material : NIST Potassium Chloride 999b

Certificate Issue Date: 13 Jul 2015
Expiration Date: 06 Nov 2015

Intended Use: This Certified Reference Material (CRM) is primarily for use in calibration and testing of conductivity cell constants. This CRM many be used to verify conductivity.

Description: One unit of Altus Solution 100 conductivity standard consists of a 60mL solution produced from ultrapure, filtered, deionised water with an initial conductivity no greater than 0.058 µS/cm (at point of production).This water is mixed with NIST KCl (SRM 999b) in equilibrium with atmospheric Carbon Dioxide. The solution is stored and shipped in scrupulously cleaned HDPE vials.The solution should be used in the presence of ambient carbon dioxide and should NOT be degassed prior to or during use.

Instructions for Use: These CRMs should be stored in the original shipping container and refrigerated to 5 ± 4 'C upon receipt. Bottles should remain tightly closed between uses. Avoid contaminating open containers. The certified values and stated uncertainties will be valid through the date listed on the bottle.

Period of Validity: The certified values are monitored and purchasers will be notified of any significant changes resulting in recertification or withdrawal of this certified reference material during the period of validity of this certificate. The 60ml ready to use standards are intended for single use only. The validity period is no longer valid once opened or used.

Expanded Uncertainty: The uncertainty takes into account the purity of the starting materials, uncertainty of the balance and volumetric uncertainties. The expanded uncertainty is expressed as 2.5 times the manufacturing uncertainty. The uncertainty applies to the product as supplied.[2,3]

Traceability: The CRMs are manufactured from the NIST Potassium Chloride (KCl) reference standard sources shown above. This results in direct **Metrological Traceability** to the National Institute of Standards and Technology (NIST).

CertifiedValue: Is the actual "made-to" concentration confirmed by Altus Science. Conductivity analytical verification and acceptance criteria are set for quality acceptance of this product.

Method of Preparation: This material was prepared and certified by Altus Science – Altus Science operates a quality system. The guidelines used will be audited by UKAS. Altus Science is working to the principles of ISO 17025:2005 as a Testing Laboratory and ISO Guide 34:2009 for CRM manufacture. Conductivity Standards consist of ultrapure, filtered, deionised water with an initial TOC no greater than 0.100 mg/L C together with NIST KCl. This solution is not preserved.

Certifying Officer: *Graham Roscoe*

References:
1) US Pharmacopeia 32-NF 27, General Chapter USP Total Organic Carbon <643>, (USP Convention, USA, 2009).
2) ISO/IEC Guide 98-3:2008, Uncertainty of Measurement – Part 3: Guide to the Expression of Uncertainty in Measurement (GUM:1995).
3) ISO Guide 35:2006(E), Reference materials-General and Statistical Principles.
4) ISO Guide 34:2009(E), General Requirements for Competence of Reference Material Producers.
5) ISO/IEC 17025:2005(E), General Requirements for the Competence of Testing and Calibration laboratories.
6) ISO Guide 31:2000(E), Reference Materials - Contents of Certificates and Labels.

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