Agilent Technologies

CERTIFICATE OF ANALYSIS

Agilent Product Name: 500 µg/g Ag,Al,B,Ba,Ca,Cd,Cr,Cu,Fe,K,Mg,Mn,Mo,Na,Ni,P,Pb,Si,Sn,Ti,V,Zn in 75 cSt Hydrocarbon Oil
Agilent Part No: 5190-8712
Lot No: 001120173K

Product Specifications

Analyte	Starting Material	CAS #	Certified Conc.	Analyte	Starting Material	CAS #	Certified Conc.
Ag	Proprietary	n/a	500.0 ± 5.0 µg/g	Mn	Proprietary	n/a	499.9 ± 5.0 µg/g
Al	Proprietary	n/a	499.8 ± 5.0 µg/g	Mo	Proprietary	n/a	500.0 ± 5.0 µg/g
B	Proprietary	n/a	499.9 ± 5.0 µg/g	Na	Proprietary	n/a	502.4 ± 5.0 µg/g
Ba	Proprietary	n/a	501.6 ± 5.0 µg/g	Ni	Proprietary	n/a	500.3 ± 5.0 µg/g
Ca	Proprietary	n/a	499.9 ± 5.0 µg/g	P	Proprietary	n/a	500.0 ± 5.0 µg/g
Cd	Proprietary	n/a	499.9 ± 5.0 µg/g	Pb	Proprietary	n/a	499.9 ± 5.0 µg/g
Cr	Proprietary	n/a	499.8 ± 5.0 µg/g	Si	Proprietary	n/a	499.7 ± 5.0 µg/g
Cu	Proprietary	n/a	502.9 ± 5.0 µg/g	Sn	Proprietary	n/a	499.9 ± 5.0 µg/g
Fe	Proprietary	n/a	499.9 ± 5.0 µg/g	Ti	Proprietary	n/a	500.7 ± 5.0 µg/g
K	Proprietary	n/a	499.7 ± 5.0 µg/g	V	Proprietary	n/a	499.8 ± 5.0 µg/g
Mg	Proprietary	n/a	499.9 ± 5.0 µg/g	Zn	Proprietary	n/a	499.8 ± 5.0 µg/g

Matrix: 75 cSt Hydrocarbon Oil

Intended Use: This solution is intended for use as a certified reference material or calibration standard for the analysis of these elements in petroleum products or other organic matrices using inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), atomic absorption spectroscopy (flame AAS or GFAAS), microwave plasma atomic emission spectroscopy (MP-AES), rotating disc electrode atomic emission spectroscopy (RDE-AES), and other techniques for elemental analysis.

Certification & Traceability: This CRM was manufactured under a quality management system that is accredited to **ISO Guide 34**, **ISO/IEC 17025**, and registered to **ISO 9001**. This CRM was prepared to the certified concentrations shown above by gravimetric methods using single-element concentrates that are traceable to NIST SRMs. The balances used in the preparation of this CRM are calibrated regularly with traceability to NIST. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against NIST SRMs: 1077a, 1075a, 3107, 1051b, 3109a, 1053a, 1078b, 1080a, 1079b, 3141a, 3131a, 3132, 3134, 1069b, 1065b, 3139a, 1059c, 1066a, 1057b, 3162a, 1052b, 3168a, and/or 1085b. The uncertainty associated with each certified concentration represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: Agilent Technologies recommends that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy the analyst should: (1) use only pre-cleaned containers and transferware, (2) avoid pipetting directly from the CRM's original container, (3) use a minimum sub-sample size of 500 mg, (4) make dilutions using calibrated balances or certified volumetric class A flasks and pipettes, (5) dilute to volume or weight with the same matrix as the original CRM, and (6) never pour used product back into the original container. Fresh solutions should be prepared daily. The solution should be kept tightly capped. Store at controlled room temperature per USP 35 (10.30.60). Do not freeze, heat, or expose to direct sunlight. Minimize exposure to moisture or high humidity.

Period of Validity: Agilent Technologies ensures the accuracy of this solution until the expiration date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Sample lot approver:

Julie M. MacIntosh

QA Manager

Date of release: 19 April 2016
Date of expiration: 06 October 2017

Hazard Information: Refer to the Safety Data Sheet (SDS), which can be obtained at www.agilent.com/chem/sds.

Homogeneity: This solution was determined to be homogeneous by procedures consistent with the requirements of ISO Guide 34 and ISO Guide 35. Replicate samples of the finished solution were analyzed to confirm its homogeneity, in accordance with QSP 6-13 Assessment of Homogeneity and Stability. To ensure homogeneity, users should not take a smaller sub-sample than specified in the Instructions for Use, as doing so will invalidate the certified values and uncertainties.

Further Information: Please contact Agilent Technologies for further information about this CRM.

Quality Certifications: This CRM was prepared under a quality management system that is:

- Registered to ISO 9001 – Quality Management Systems – Requirements (TUV NORD Cert. No. 44 100 16560231)
- Accredited to ISO Guide 34 – General Requirements for the Competence of Reference Material Producers (A2LA Cert. No. 2848.02)
    - ISO Guide 34 references additional requirements specified in ISO Guide 31 and ISO Guide 35.
- Accredited to ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories (A2LA Cert. No. 2848.01)