

Alpha Resources, LLC

Certificate Of Analysis

AR-724

SULFUR IN COKE REFERENCE MATERIAL

LOT # 724517

LID ID # 724517

DRIED BASIS VALUE

WEIGHT PERCENT SULFUR = 1.21

EXPANDED UNCERTAINTY = 0.03

METHOD:

ASTM D 4239-14 AND ARI-035

This CRM is traced to N.I.S.T. SRM 2776, NCS FC28014, FC93005

The intended use of this reference is for the calibration and verification of sulfur in metallurgical coke by resistance combustion and infra-red detection as described in ASTM D4239. The analytical values were derived by a number of data points (n=40), and reported in mass fraction. The typical and minimum sample size for analysis is 300mg. The precision value represents the expanded degree of uncertainty based on errors from analytical assay at a 95% confidence level (k=2), and may not fit within your testing capabilities. Formal testing procedures should be followed when using this reference standard; this includes using the *reproducibility* and *repeatability* factors of the method for establishing overall analytical uncertainty. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Technical Manager, at Alpha Resources.

The material used in production of this reference standard was identified in accordance with ARI 041. The samples for round robin testing were selected in accordance with ARI 031. The above values relate only to the material used to produce this reference standard. The analytical samples were dried per the NMI used or corrected for moisture as per the test method. This CRM was produced in accordance to ISO 17034 and ISO Guide 31.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages. The above values relate only to the material used to produce this CRM. This certificate cannot be reproduced except in full. This bottle contains 50g, minus 60 mesh (250 micron) coke powder. When kept stored and sealed properly this product has an indefinite shelf life. Once opened this certificate is valid for two years.

This is a Certified Reference Material (working reference standard), and is traceable to the above-mentioned reference materials. For good laboratory practice, it is recommended that all standards be verified prior to use. These test results are accredited under the Alpha Resources Inc. laboratory's ISO/IEC 17025 and ISO Guide 34 accreditation (RMP) issued by ANSI-ASQ/ANAB. Refer to certificate and scope of accreditation(s) AC-1200 and AR-1920.

EXPIRATION DATE

THIS CRM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING

Certified May 25, 2017



Technical Manager