ALPHA RESOURCES LLC

Value Beyond Measure

Certificate of Analysis

AR6121
LOT 319C
HYDROGEN IN CARBON MATRIX

WEIGHT PERCENT HYDROGEN = 0.105%
EXPANDED UNCERTAINTY = ± 0.006%
(k=2.306, 95% confidence limit, n=8)

Verified using ASTM E1447-09(modified) inert gas fusion using graphite crucible and thermal conductivity detection. Reference materials AR592-616A and AR649-916F were used for validation.

NOTES:

This reference material was produced using high purity materials based upon their empirical and stoichiometric properties. These materials were weighed on balances that are calibrated using NIST traceable weights and blended. The values reported are in SI units and based on metrology and verification testing incorporating ISO Guide 35, The Guide to Uncertainty Measurement, and ANOVA at a 95% confidence limit. No known materials of this type and hydrogen content are available for testing traceability. The sample size used for the verification tests were nominal 0.1g. Refer to your instrument manufacturer or test method for your required sample size and overall test method repeatability and reproducibility factors if needed. The overall coordination, direction, and calculation of statistical information was performed by K.E. Dyer, Chief Chemist.

The intended use of this standard is for the verification and quality check of hydrogen in carbon matrix using ASTM methods utilizing inert gas fusion with thermal conductivity or infrared detection instrumentation. This bottle contains 25g powder material to be used directly and per your test method requirements. While unable to determine a definite shelf life, this reference material should be reviewed 20 years from the date of certification. This certificate cannot be reproduced except in full.

This RM was produced in accordance to ISO 17034 and 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.

Certified March 22, 2019

Chief Chemist