

## Certificate of Analysis

Part No. B2841

### Sulphur in Crude Oil

Certificate Number 041819

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**Weight Percent Sulphur = 0.050**  
**Expanded Uncertainty = ± 0.004**  
**(k=2, @95% confidence limit, n=30)**

**Method used for analysis: ASTM D 4294-16, ARI-078**

**NMI Standard(s) used: NIST 2722**

**Alpha – AR2945-945100, AR2944-944100, AR2041-411213, AR2042-042218, AR2947-947100,  
AR2943-943100, AR2041-041911**

#### Notes:

The intended use of this standard is for the calibration and or verification of sulphur analysis in crude oil or similar materials by XRF or other valid testing methods. This standard was produced gravimetrically using high purity materials, with balances calibrated and checked by precision NIST traceable weights. The above ASTM test method and NMI references listed were used for testing. The uncertainty value represents the estimated expanded uncertainty using ANOVA, ISO Guide 35, and the Guide to Uncertainty Measurement. Metrological traceability is to the SI derived unit of mass fraction expressed as percent. The sample size used for testing was placed into a removable sample cup, equipped with replaceable X-ray transparent plastic film and providing a sample depth of at least 4mm and a diameter of at least 10mm. When necessary, professional judgment is applied toward consideration of data and statistical information. Normal test procedures should be employed when using this standard. This includes using the reproducibility and repeatability uncertainty for the test method you wish to employ. The material used in production of this 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 standard.

Before use, the contents of the bottle should be mixed by vigorous shaking. Any exposure to air and light should be kept to a minimum. Keep sealed and store upright under normal laboratory conditions. This bottle contains 100ml to be used as per the test method. Sample size and minimum sample size may be contingent upon your test method or instrumentation manufacturer recommendations. While unable to determine a definite shelf life this reference should be reviewed 10 years from the date of certification. Once opened this certificate is valid for two years.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event, shall Elemental Microanalysis Ltd be liable for incidental or consequential damages. This certificate cannot be reproduced except in full.

This Reference Material is traceable to the above-mentioned standards. For good laboratory practice, it is recommended that all standards be verified as fit for purpose prior to use.

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

Certified August 8, 2019

Elemental Microanalysis Ltd