

CERTIFICATE OF CALIBRATION

ISO 17025 / ISO 17034 SULFUR CERTIFIED REFERENCE MATERIAL

Product Code: **IOSU-020** Lot Number: **3191204** Certificate No: **3417**
Issue Date: Expiry Date:
Matrix: **Iso-Octane** Certified Value: **10 ppm / 0.0010 % (w/w) Sulfur**

Intended Use:

This Certified Reference Material (CRM) is for the purposes of calibration, verification or for use in quality control procedures used for analysing Sulfur content in petroleum products, either by X-ray fluorescence spectrometry (XRF) or other methodologies used in the analysis of Sulfur.

Uncertainties:

Uncertainties for the calibration of this Standard are:

Expanded Uncertainty: **$\pm 1\%$ (Relative)**

The reported expanded uncertainty is based on a combined standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Uncertified Values:

Density: 0.6919 g/mL @ 20 °C

The density was measured using a digital densitometer according to ASTM D4052.

Certification:

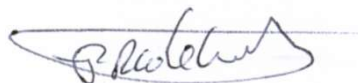
This Standard was prepared from Di-n-butyl Sulfide and Iso-Octane, of known purity, by gravimetric methods. The balances used in this process are calibrated on a regular basis with the calibration being traceable to National Institute Standards and Technology (NIST) and other recognised national standards laboratories. In order to confirm the certified value of this CRM a secondary verification was carried out using XRF. This certificate provides traceability of measurement to recognised national standards, and to units of measurement recognised at National Institute Standards and Technology (NIST) and other recognised national standards laboratories.

Instructions:

Prior to using this CRM it is recommended that the container be mixed, either by shaking or swirling. Ensure that when transferring to further glassware that this glassware is clean and suitable. If dilutions are performed then these dilutions must be performed using calibrated balances when done gravimetrically, or Class A glassware is used if the dilution is done volumetrically. Any dilution must be done using the same matrix as the CRM. In order to prevent contamination of the CRM any pipetting should not be done directly from the CRM's original container and any excess sample should not be returned to the original container.

Homogeneity and Stability:

The shelf life of this product is guaranteed until the expiry date, provided the bottle is unopened and stored between 5 °C to 30 °C. The guarantee is void if the bottle seal is broken. Always keep container sealed when not in use. This product has been produced according to in-house procedures and its homogeneity is guaranteed to be fit for purpose when used with a sample size appropriate for the intended measurement method.



Approved Signatory, Mr. P. Whitehurst, Technical Director

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory (NPL) or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. UKAS is one of the signatories to the Multilateral Agreement of European co-operation for Accreditation (EA) for the mutual recognition of calibration certificates issued by accredited laboratories.

