

Ultimate Coal Certified Reference Material

Product No: AR2778

Lot No: 240624

Material and Use

AR2778 is a Certified Reference Material (CRM) intended for use in the verification and calibration of the test methods listed below. All reference materials should be verified as fit for purpose prior to use. Recommended minimal sample size for analysis is 1.0 g, but is ultimately dependent upon the method and instrumentation used. This product comes as a fine powder and should be kept sealed tight and stored under normal laboratory conditions. Certified values are valid for 10 years from the initial date of certification.

Table 1. Certified Values for AR2778, Lot 240624.

| Measurand | Value | (+/-) | Method & Detection | n | k |
|-------------------|-------|-------|-------------------------------|----|-----|
| % Ash | 13.40 | 0.21 | Thermogravimetry/Mass Balance | 21 | 2.1 |
| % Volatile Matter | 25.24 | 1.65 | Thermogravimetry/Mass Balance | 21 | 2.1 |
| % Sulfur | 0.86 | 0.10 | Combustion/IR | 40 | 2.0 |
| BTU/lb | 12438 | 117 | Calorimetry | 8 | 2.4 |
| % Carbon | 73.05 | 1.01 | Combustion/IR | 8 | 2.4 |
| % Hydrogen | 3.54 | 0.73 | Combustion/TC | 8 | 2.4 |
| % Nitrogen | 1.27 | 0.24 | Combustion/TC | 8 | 2.4 |

Note: (+/-) indicates expanded uncertainty.

Table 2. Non-Certified and Reference Values for AR2778, Lot 240624.

| Measurand | Value | (+/-) | Method |
|-----------------------|-------|-------|------------|
| % Fixed Carbon (calc) | 61.36 | -- | ASTM D3172 |
| % Oxygen (calc) | 7.98 | -- | ASTM D3176 |

Calculation of Reported Values

Analytical values are accredited under Alpha Resources, LLC ISO/IEC 17025 and ISO 17034 accreditation issued by ANSI National Accreditation Board (ANAB). Please refer to certificates and scopes of accreditation AT-1200 and AR-1920. Sampling and calculation of reported values for each analyte are performed in compliance with guidance found in ISO 17034, ISO 33401, and ISO Guide 35. Material homogeneity, uncertainty of primary reference standards, characterization uncertainty from contributing laboratories, and other factors are considered in the assessment of overall measurand uncertainty. Expanded uncertainty is calculated by application of a coverage factor to the combined uncertainty value. Certified values are metrologically traceable to the SI derived unit of mass fraction expressed as a percent and to the derived unit of BTU/lb.

Methods and References

ISO/IEC 17025:2017 – General requirements for the competence of testing and calibration laboratories

ISO 17034:2016 – General requirements for the competence of reference material producers

ISO 33401:2024 – Reference materials – Contents of certificates, labels, and accompanying documentation

ISO Guide 30:2015 – Terms and definitions used in connection with reference materials

ISO Guide 35:2017 – Reference materials – General and statistical principles for certification



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