ALPHA RESOURCES® Value Beyond Measure

# Certificate of Analysis

## AR4021 Composite Soil CRM

| AR4021, Lot#240116 – Certified Values | | | | | |
|---|---|---|---|---|---|
| | **Mean** | **St Dev** | **Expanded Uncertainty** | **n** | **k** |
| **% C** | 3.26 | 0.05 | 0.12 | 15 | 2.14 |
| **% S** | 0.050 | 0.003 | 0.007 | 15 | 2.14 |

**Method of Analysis: ALY-011**

**Primary (NMI)/GUIDE 34/ISO 17034 Reference Standards Employed:**

| | |
|---|---|
| **%C** | Leco 502-698 |
| **%S** | AR892 |

**This product is a Certified Reference Material (CRM). All reference materials should be verified as fit for purpose prior to use. Analytical values are accredited under Alpha Resources, LLC ISO/IEC 17025 and ISO 17034 accreditation issued by ANSI National Accreditation Board (ANAB). Refer to certificates and scopes of accreditation AT-1200 and AR-1920. Each bottle contains 100 g of material intended for use directly from the bottle without preparation. Nominal recommended sample size is 0.2 to 0.5 g.**

**The intended use is for carbon and sulfur determination in soil and other similar matrices using induction and resistance-type oxygen combustion furnaces with infrared detection systems. Accelerants such as tungsten trioxide ($WO_3$) were used in the resistance furnace. Tungsten metal and iron chip accelerators were used in the induction analysis.**

**The mean analytical values were derived by separate data sets with traceability to the above-mentioned reference standards. Metrological traceability is to the SI derived unit of mass fraction expressed as percent. The precision values represent the estimated mean value and uncertainty derived from the data sets utilizing ANOVA, ISO Guide 35, and the Guide to Uncertainty Measurement. Refer to the test method for additional information related to measurement uncertainty.**

**While unable to determine a definite shelf life, this reference material should be reviewed every 20 years from the date of certification. Keep sealed and store under normal laboratory conditions. 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. This certificate cannot be reproduced except in full. Produced in accordance with ISO 17034.**

**Certification Date: May 16, 2024**

**Dustin Jenkins, Ph.D.**
**Global Technical Director**

ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER