



# Certificate of Analysis

AR-2771

ULTIMATE COKE CRM

LOT # 771223

LID # 771223

## DRIED BASIS VALUES

Proximate Analysis				n=	k=	ASTM	Ultimate Analysis				n=	k=	ASTM
% Ash.....	7.69 ± 0.22	18	2.1	D3174/D7582	% Carbon.....	90.30 ± 2.26	8	2.4	D5373				
% Volatile Matter.....	(0.7)	--	--	D3175/D7582	% Hydrogen.....	(0.27)	--	--	D5373				
% Fixed Carbon(calculated)	(91.61)	--	--	D3172	% Nitrogen.....	1.04 ± 0.24	8	2.4	D5373				
% Sulfur.....	0.59 ± 0.03	36	2.0	D4239	% Oxygen (calculated)...	(0.11)	--	--	D3176				
*Btu/lb.....	13281±281*	7	2.4	D5865									

\*Note: Proper technique and complete combustion is required. Exceeds method reproducibility.

Mineral Analysis					Mineral Analysis				
		n=	k=	ASTM			n=	k=	ASTM
% Silica.....	45.25 ± 0.91	8	2.4	D5600/D6349	% Sodium Oxide.....	0.80 ±0.09	8	2.4	D5600/D6349
% Alumina.....	25.75 ± 1.60	8	2.4	D5600/D6349	% Sulfur Trioxide.....	(1.64)	--	--	D5600/D6349
% Titania.....	1.31 ± 0.10	8	2.4	D5600/D6349	% Phosphorus Pentoxide	0.38 ±0.03	8	2.4	D5600/D6349
% Ferric Oxide.....	17.83 ± 1.11	8	2.4	D5600/D6349	% Strontium Oxide.....	(0.12)	--	--	D5600/D6349
% Calcium Oxide.....	2.65 ± 0.50	8	2.4	D5600/D6349	% Barium Oxide.....	(0.18)	--	--	D5600/D6349
% Magnesium Oxide...	1.15 ± 0.08	8	2.4	D5600/D6349	% Manganese Oxide...	(0.12)	--	--	D5600/D6349
% Potassium Oxide...	1.73 ± 0.21	7	2.5	D5600/D6349					

REFERENCES USED: Sulfur - NIST - SRM 2775, 2776, 2719, NCS - CRM FC93005, FC28014; BTU - Benzoic Acid; C/H/N - EDTA, SRM 2775, 2776; Mineral analysis NIST 1635a, 2689, 634a.

() Indicates reference or information only value due to variability, limited data, or below analysis limits.

The intended use of this standard is for the verification of various tests by the above-mentioned methods. Typical sample size for analytical testing and minimum size is subject to the test method and instrumentation used. The uncertainty values represent the expanded uncertainty at 95% confidence limits obtained through analytical testing by the mentioned ASTM methods utilizing ANOVA, ISO Guide 35, and the Guide to Uncertainty Measurement. Metrological traceability is to the SI derived units expressed in mass fraction as percent, or BTU/lb. Normal test procedures should be employed when using this standard; this includes using the *reproducibility* and *repeatability* factors of the method for establishing analytical uncertainty if needed. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Chief Chemist at Alpha Resources.

The material used in production of this standard was identified in accordance with ARI-LAB-603. The samples for round-robin testing were selected in accordance with ARI-LAB-625. The above values relate only to the material used to produce this standard. The analytical samples should be dried or corrected for moisture as per the test method you are using. This bottle contains 50g fine coke powder (-60 mesh). While unable to determine a definite shelf life this reference standard should be reviewed 20 years from the date of certification. Once opened this certificate is valid for two years. Keep sealed tight and store under normal laboratory conditions. This certificate cannot be reproduced except in full. 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 is a Certified Reference Material (CRM) and is traceable to the above-mentioned references. For good laboratory practice it is recommended that all standards be verified as fit for purpose prior to use. This standard was produced in accordance with ISO 17034 (RMP) accreditation issued by ANSI-ANAB. Refer to certificate and scope of accreditation AR1920.

EXPIRATION DATE

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

CERTIFIED June 7, 2023

Kent Dyer