

# Alpha Resources, Inc.

## Certificate Of Analysis

AR-744  
CALCINED PETROLEUM COKE STANDARD  
LOT # 744216 LID # 744216

ALL ANALYSIS REPORTED ON A DRIED BASIS VALUE			METHODS USED
MEAN WEIGHT PERCENT SULFUR*	=	2.50 ± 0.06	ASTM D4239
MEAN WEIGHT PERCENT ASH	=	(0.27)	ASTM D3174, D4422
MEAN WEIGHT PERCENT VOL. MAT.	=	(0.57)	ASTM D3175
BTU/POUND	=	13,939 ± 128	ASTM D5865
FIXED CARBON (CALCULATED)	=	(99.16)	ASTM D3172
MEAN WEIGHT PERCENT CARBON	=	96.21 ± 0.46	ASTM D5373
MEAN WEIGHT PERCENT HYDROGEN	=	(0.22)	ASTM D5373
MEAN WEIGHT PERCENT NITROGEN	=	1.03 ± 0.07	ASTM D5373
PPM- ug/g NICKEL	=	143 ± 25	ASTM D5056, D6376
PPM- ug/g IRON	=	855 ± 85	ASTM D5056, D6376
PPM- ug/g VANADIUM	=	230 ± 7	ASTM D5056, D6376
PPM- ug/g CALCIUM	=	83 ± 5	ASTM D5056, D6376
PPM- ug/g SILICON	=	131 ± 49	ASTM D5056, D6376

Numbers in brackets are given for reference only.

\*Sulfur value of this Certified Reference Material is traced to N.I.S.T. SRM 2719, 2722

The precision value represents the expanded degree of uncertainty based on errors from analytical assay at a 95% confidence level ( $k=2$ ). 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 at Alpha Resources. Normal testing procedures should be employed when using this standard; this includes using the *reproducibility* and *repeatability* factors based upon your test method.

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. The analytical samples are recommended to be dried per the test method used. This bottle contains 50g, fine -60 mesh (250u) calcined petroleum coke powder. Kept sealed this item has an indefinite shelf life. Once opened this certificate is valid for 2 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 Alpha Resources be liable for incidental or consequential damages. The above values relate only to the material used to produce this standard. This certificate cannot be reproduced except in full.

This is a Certified Reference Material (CRM), and is traceable to the above-mentioned standards. For good laboratory practice it is recommended that all standards be verified prior to use. This standard was produced in accordance to ISO Guide 34 and Guide 31. Alpha Resources has become accredited under the ISO Guide 34:2009 for RMP and holds an ISO 17025 accreditation. Refer to certificate and scope of accreditation for details.

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

Certified May 16, 2016

