

# Alpha Resources, Inc.

## Certificate Of Analysis

AR-744  
CALCINED PETROLEUM COKE STANDARD  
LOT # 744809 LID # 744809

ALL ANALYSIS REPORTED ON A DRIED BASIS VALUE			METHODS USED
MEAN WEIGHT PERCENT SULFUR	=	2.53 +/- 0.06	ASTM D4239
MEAN WEIGHT PERCENT ASH	=	0.33 +/- 0.14	ASTM D3174, D4422
MEAN WEIGHT PERCENT VOL. MAT.	=	0.45 +/- 0.18	ASTM D4421, D3175
BTU/POUND	=	13,989 +/- 40	ASTM D3286, D5865
FIXED CARBON (CALCULATED)	=	99.23	ASTM D3172
MEAN WEIGHT PERCENT CARBON	=	95.58 +/- 1.34	ASTM D5373
MEAN WEIGHT PERCENT HYDROGEN	=	(0.23)	ASTM D5373
MEAN WEIGHT PERCENT NITROGEN	=	0.92 +/- 0.08	ASTM D5373
PARTS PER MILLION NICKEL	=	164 +/- 26	ASTM D5056, D3682, D6376
PARTS PER MILLION IRON	=	917 +/- 286	ASTM D5056, D3682, D6376
PARTS PER MILLION VANADIUM	=	239 +/- 8	ASTM D5056, D3682, D6376
PARTS PER MILLION CALCIUM	=	79 +/- 4	ASTM D5056, D3682, D6376
PARTS PER MILLION SILICON	=	153 +/- 54	ASTM D5056, D3682, D6376

Numbers in brackets are given for reference only.

Portions of this Certified Reference Material are traced to N.I.S.T. SRM 2718

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 ASTM procedures should be employed when using this standard, this includes using the *reproducibility* and *repeatability* factors of the method for establishing analytical uncertainty.

The samples for round robin testing were selected in accordance with ARI 014. The above values relate only to the material used to produce this standard. The analytical samples are recommended to be dried under a nitrogen atmosphere for a minimum of 70 minutes at 107° C +/- 3° C until a steady mass is achieved

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.

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

Certified December 10, 2009



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