

Alpha Resources, Inc.

Certificate Of Analysis

AR 147
COPPER PIN STANDARD
OXYGEN & SULFUR
LOT #113C

WEIGHT% OXYGEN
MEAN = 0.0007%
Standard Deviation = +/- 0.0001%
Expanded uncertainty = +/- 0.0002%
(k=2, 95% confidence)

WEIGHT% SULFUR
MEAN = 0.0013%
Standard Deviation = +/- 0.0003%
Expanded Uncertainty = +/- 0.0006%
(k=2, 95% confidence)

CARBON = <0.002% (REFERENCE ONLY)
NITROGEN = <0.0002% (REFERENCE ONLY)
HYDROGEN = <0.0002% (REFERENCE ONLY)

Oxygen	Inert Gas Fusion IR Detection
Sulfur	Combustion - IR Detection
Carbon	Combustion - IR Detection
Nitrogen	Inert Gas Fusion TC Detection
Hydrogen	Inert Gas Fusion TC Detection

Standard Reference Materials employed:
NIST 494, 495, 2159, 2165, 1096, 1098
EURO BAM 099-1, BCR 99
INMF Cu-S20
JSS GS-2C, 384-1
NCS HC11011, NS11031

Notes:

The mean analytical values were derived by a number of data sets (n=50). The precision values represent the standard deviation, two times the standard deviation (k=2, 95% confidence) obtained from analysis. 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, Technical Manager at Alpha Resources.

The methodology follows ASTM E1019-08, ARI 033, and ARI 034. The material used in production of this standard was sampled in accordance with ARI 032. The samples for analytical testing were selected in accordance with ARI 014. The above values relate only to the material used to produce this standard. This standard consists of 100g, 1g pins, to be used with no preparation, and has no expiration date.

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 (Working Standard), 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 Guide 34. Alpha Resources has become accredited under the ISO Guide 34:2009 for RMP and holds a ISO 17025 accreditation. Refer to certificate and scope of accreditation for details.

Certified February 22, 2013



Kent Dyer - Technical Manager