

# Alpha Resources, Inc.

## Certificate Of Analysis

AR 149  
COPPER PIN STANDARD  
OXYGEN & SULFUR  
LOT # 534985A01

PPM OXYGEN  
MEAN = 305 PPM  
ONE SIGMA = +/- 3 PPM  
TWO SIGMA = +/- 6 PPM  
RANGE = 299 - 311 PPM

PPM SULFUR  
MEAN = 6 PPM  
ONE SIGMA = +/- 1  
TWO SIGMA = +/- 2  
RANGE = 5 - 8 PPM

PPM CARBON = 10 PPM (REFERENCE ONLY)  
PPM NITROGEN = 2.5 PPM (REFERENCE ONLY)

### Methods of Analysis

Oxygen	Inert Gas Fusion IR Detection
Sulfur	Combustion - Iodate Titration / IR Detection
Carbon	Combustion - IR Detection
Nitrogen	Inert Gas Fusion TC Detection

Standard Reference Materials employed were  
NIST 343a, 396 NCS HC 11011, NC 20017, NC 20018, BCS 260/4

### Notes:

The mean analytical values were derived by a number of data sets obtained by the above methods.

The precision value is based on the standard deviation, two times the standard deviation, and complete range of analysis obtained by the data sets. When necessary, professional judgment is applied toward consideration of data and statistical information. Carbon and Nitrogen given for reference only.

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.

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 standards. For good laboratory practice it is recommended that all standards be verified prior to use.

Certified October, 2001



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