



# Certificate of Analysis

## AR647 Titanium Pin CRM

AR647, Lot# 623X - Certified Values			
	% Oxygen	% Nitrogen	% Hydrogen
Mean	0.1048	0.0040	0.0117
St Dev	0.0081	0.0005	0.0003
Exp Uncertainty	0.0171	0.0012	0.0008
k=2, @ 95% CI	n=40	n=40	n=40

Method of Analysis: ASTM E 1409-13, ASTM E1447-09, ARI-LAB-622, ARI-LAB-623

Primary (NMI)/GUIDE 34/ISO 17034 Reference Standards Employed:

NIST SRM	2453a, 2454, 2454a, 2452, 173c, 173b, 360b,
NCS	NS11093, NS11091, NS57101
AR	AR647-220G, AR648-614D, AR647-917A, AR648-1219A, AR647-415D, AR648-1218A, AR648-721Y, AR650-718A, AR642-813B

This product is a Certified Reference Material (CRM) traceable to the above-mentioned reference standards. All reference materials should be verified as fit for purpose prior to use. Analytical values are accredited under Alpha Resources, LLC ISO/IEC 17025 and ISO 17034 accreditation issued by ANSI National Accreditation Board (ANAB). Refer to certificates and scopes of accreditation AT-1200 and AR-1920. Each bottle consists of a total of 10 g material in 0.1 g (nominal) pins and is intended for use directly from the bottle without preparation. Multiple pins may be used per test method requirements with a minimum sample size of 1 pin.

The intended use of this reference material is for the calibration and validation of inert gas fusion, infrared (oxygen) and thermal conductivity (nitrogen, hydrogen) detection analyzers as described in the above ASTM methods. The mean analytical values were derived by separate data sets with traceability to the above-mentioned reference standards. Metrological traceability is to the SI derived unit of mass fraction expressed as percent. The precision values represent the estimated mean value and uncertainty derived from the data sets utilizing ANOVA, ISO Guide 35, and the Guide to Uncertainty Measurement. Refer to the test method for additional information related to measurement uncertainty.

While unable to determine a definite shelf life, this reference material should be reviewed every 20 years from the date of certification. Keep sealed and store under normal laboratory conditions. 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 certificate cannot be reproduced except in full. Produced in accordance with ISO 17034.

Certification Date: April 10, 2024

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