National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 858

Aluminum Alloy 6011 (Modified)

(In Cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is in the form of fine millings, intended primarily for use in validating chemical methods of analysis. Material from the same lot is available in disk form as SRM 1258, intended primarily for use in optical emission and x-ray spectrometric methods of analysis.

Element	Analysts					Certified Value (Wt %)[1]	Estimated Uncertainty[2]
	1	2	3	4	5		
Silicon	0.78[a]		0.79[a]	0.80[b]	0.79[c]	0.79	0.017
Iron	0.080	0.077	0.077	0.78 0.080[d]		0.078	0.003
Copper	0.85	0.83	0.85	0.84	0.85[e]	0.84	1.01
Manganese	0.49	0.47	0.48	0.48	0.49[f]	0.48	0.01
Chromium	0.0011		0.0013	0.0010		0.0011	0.0002
Nickel	0.0007		<0.001	0.0006		0.0006	0.0002
Zinc	1.02	1.06	1.04	1.04	1.06[g]	1.04	0.02
Magnesium	1.00	1.02	1.01	1.01	1.02[g]	1.01	0.01
Beryllium	<0.000		<0.0001[h]	<0.0001[i]		<0.0001	
Titanium	0.041[h]		0.042[j]	0.043[j]	0.044[k]	0.042	0.002
Vanadium	0.0028[l]		0.0029[l]	0.0030[l]		0.0030	0.005

[1]The certified value listed for a constituent is the *present best estimate* of the "true" value based on the results of the cooperative program for certification.

[2]The estimated uncertainty listed for a constituent is based on judgment and represents an evaluation of the combined effects of method imprecision, possible systematic errors among methods, and material variability for samples 0.5 g or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents.)

Note: One laboratory reported a value of <0.001 % lead.

This Certificate of Analysis has undergone editorial revision to reflect program and organizational changes at NIST and at the Department of Commerce. No attempt was made to reevaluate the certificate values or any technical data presented on this certificate.

The overall coordination of the technical measurements leading to certification was performed under the direction of J.I. Shultz, Research Associate, ASTM-NIST Research Associate Program.

The technical and support aspects involved in the original certification and issuance of this SRM were coordinated through the Standard Reference Materials Program by R.E. Michaelis and R. Alvarez. Revision of this certificate was coordinated through the Standard Reference Materials Program by P.A. Lundberg.

Gaithersburg, MD 20899
March 15, 1995
(Revision of certificate dated 6-6-80)

Thomas E. Gills, Chief
Standard Reference Materials Program

(over)

METHODS/TECHNIQUES

Gravimetric - Silicon
Atomic Absorption - Iron, Copper, Manganese, Chromium, Nickel, Zinc, Magnesium
Photometric - Titanium, Vanadium

[a]Alkali dissolution of the sample
[b]Same value obtained by atomic absorption
[c]Acid dissolution of the sample
[d]1, 10 Phenanthroline spectrophotometric
[e]Electrodeposition
[f]Ammonium peroxydisulfate oxidation-titration with standard solution of sodium arsenite
[g]Titration with EDTA
[h]Atomic absorption
[i]Fluorimetric with morin after extraction with acetylacetone-chloroform
[j]Diantipyrylmethane spectrophotometric
[k]H_2O_2 spectrophotometric
[l]N-benzoyl-N-phenylhydroxylamine spectrophotometric

PLANNING, PREPARATION, TESTING, ANALYSIS

The material for this SRM was prepared under contract with NIST by the Aluminum Company of America, Alcoa Center, PA.

Homogeneity testing was performed by optical emission spectrometry at the Aluminum Company of America, Alcoa Center, PA, D.J. Levin and by R.K. Bell, Assistant Research Associate, ASTM-NIST Research Associate Program.

Cooperative analyses for certification were performed in the following laboratories:

Aluminum Company of America, Alcoa Technical Center, Alcoa Center, PA, D.J. Levin.

Kaiser Aluminum and Chemical Corp., Pleasanton, CA, H.J. Seim, R.C. Calkins, G.M. Calkins, R.C. Kinnie, and J.R. Skarset.

Kaiser Aluminum and Chemical Corp., Ravenswood Works, Ravenswood, WV, J.M. Hunter and H.E. Newsome.

National Institute of Standards and Technology, R.K. Bell, Assistant Research Associate, ASTM-NIST Research Associate Program.

Reynolds Aluminum, Research and Development, Reynolds Metals Company, Richmond VA, W.E. Pilgram.