
INTERNATIONAL STANDARD



1118

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Aluminium and aluminium alloys — Determination of titanium — Spectrophotometric chromotropic acid method

Aluminium et alliages d'aluminium — Dosage du titane — Méthode spectrophotométrique à l'acide chromotropique

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1118 was developed by Technical Committee ISO/TC 79, *Light metals and their alloys*.

It was submitted directly to the ISO Council, in accordance with clause 6.13.1 of the Directives for the technical work of ISO. It cancels and replaces ISO Recommendation R 1118-1969, which had been approved by the member bodies of the following countries :

Belgium	Iran	South Africa, Rep. of
Canada	Israel	Spain
Colombia	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Egypt, Arab Rep. of	Korea, Rep. of	Thailand
France	Netherlands	Turkey
Germany, F.R.	New Zealand	United Kingdom
Hungary	Norway	U.S.A.
India	Poland	U.S.S.R.

No member body had expressed disapproval of the document.

Aluminium and aluminium alloys — Determination of titanium — Spectrophotometric chromotropic acid method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a general method for the spectrophotometric determination of titanium in aluminium and aluminium alloys.

The method is applicable to products having titanium contents between 0,005 and 0,3 % (*m/m*).

However, the method is not applicable completely to alloys having silicon contents greater than 1 % (*m/m*), for which it must be modified as indicated in the annex.

2 PRINCIPLE

Attack of a test portion with sodium hydroxide, and acidification of the alkaline solution with nitric acid and sulphuric acid.

Reduction of the iron(III) with ascorbic acid, and formation of the titanium-chromotropic acid complex at a chosen pH value between 2 and 2,50, controlled to within $\pm 0,05$ pH unit.

Spectrophotometric measurement of the coloured complex at a wavelength of about 470 nm.

3 REAGENTS

During the analysis, use only reagents of recognized analytical grade and distilled water or water of equivalent purity.

3.1 Sodium hydroxide, 200 g/l or approximately 5 N solution.

In a nickel dish, dissolve 200 g of sodium hydroxide in water. After cooling, make up the volume to 1 000 ml and mix. Immediately transfer the solution to a plastic container.

3.2 Sodium hydroxide, 80 g/l or approximately 2 N solution.

In a nickel dish, dissolve 80 g of sodium hydroxide in water. After cooling, make up the volume to 1 000 ml and mix.

3.3 Nitric acid, ρ 1,40 g/ml, approximately 15 N solution.

3.4 Sulphuric acid, ρ 1,48 g/ml, approximately 18 N solution.

Carefully add 500 ml of sulphuric acid, ρ 1,84 g/ml, approximately 36 N solution, to approximately 400 ml of water. After cooling, make up the volume to 1 000 ml and mix.

3.5 Sulphuric acid, ρ 1,21 g/ml, approximately 7 N solution.

Carefully add 200 ml of sulphuric acid, ρ 1,84 g/ml, approximately 36 N solution, to approximately 700 ml of water. After cooling, make up the volume to 1 000 ml and mix.

3.6 Sulphuric acid, ρ 1,06 g/ml, approximately 2 N solution.

Carefully add 60 ml of sulphuric acid, ρ 1,84 g/ml, approximately 36 N solution, to approximately 500 ml of water. After cooling, make up the volume to 1 000 ml and mix.

3.7 Sulphurous acid (H_2SO_3), solution saturated at room temperature.

3.8 Sodium sulphite, 20 g/l solution.

Dissolve 2 g of sodium sulphite (Na_2SO_3) in water and make up the volume to 100 ml.

Prepare immediately before use.