



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 886

CHEMICAL ANALYSIS OF ALUMINIUM AND ALUMINIUM ALLOYS

PHOTOMETRIC DETERMINATION OF MANGANESE

(Manganese content between 0.005 and 1.5 %)

1st EDITION
December 1968

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BRIEF HISTORY

The ISO Recommendation R 886, *Chemical analysis of aluminium and aluminium alloys – Photometric determination of manganese (Manganese content between 0.005 and 1.5 %)*, was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question by the Technical Committee began in 1961 and led, in 1966, to the adoption of a Draft ISO Recommendation.

In April 1967, this Draft ISO Recommendation (No. 1192) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Hungary	Spain
Austria	Ireland	Sweden
Belgium	Israel	Switzerland
Canada	Italy	Thailand
Chile	Japan	Turkey
Czechoslovakia	Netherlands	U.S.A.
France	Norway	U.S.S.R.
Germany	Poland	Yugoslavia
Greece	South Africa, Rep. of	

One Member Body opposed the approval of the Draft :

United Kingdom

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in December 1968, to accept it as an ISO RECOMMENDATION.

CHEMICAL ANALYSIS OF ALUMINIUM AND ALUMINIUM ALLOYS

PHOTOMETRIC DETERMINATION OF MANGANESE

(Manganese content between 0.005 and 1.5 %)

1. SCOPE

This ISO Recommendation describes a photometric method for the determination of manganese in aluminium and aluminium alloys.

The method is applicable to the determination of manganese contents between 0.005 and 1.5 %.

However, this method does not apply completely to the following special cases :

- (a) alloys with a silicon content higher than 10 % and a manganese content less than 0.1 % (see Annex);
- (b) aluminium alloys containing tin, antimony, bismuth, zirconium, etc. (In this ISO Recommendation these special cases are not treated.)

2. PRINCIPLE

- 2.1 Attack of the sample with sodium hydroxide.
- 2.2 Acidification by sulphuric and nitric acids.
- 2.3 Oxidation of manganese (II) to manganese (VII) by means of potassium periodate (acidity of solution over 3.5 N approximately), in the presence of phosphoric acid.
- 2.4 Photometric measurement at a wavelength of about 525 nm.

3. REAGENTS

For the preparation of solutions and during the analysis, use doubly distilled water.

3.1 Solutions of approximate strength

3.1.1 *Water free from reducing agents*

Bring to the boil water acidified with 10 ml of sulphuric acid (3.1.4) per litre; add a few crystals of potassium periodate (KIO_4) and maintain at boiling point for approximately 10 minutes (see Note 8.1).

3.1.2 *Sodium hydroxide solution, 200 g/l.*

In a nickel dish dissolve 200 g of sodium hydroxide (NaOH) in water and, after cooling, make up the volume to 1000 ml. Keep in a plastic container.

3.1.3 *Sulphurous acid solution*

Pass a current of sulphur dioxide gas (SO_2) through water until saturation point is reached.

3.1.4 *Sulphuric acid, $d = 1.48$ (approximately 17.5 N).*

Carefully add 500 ml of sulphuric acid, $d = 1.84$ (approximately 35.6 N), to water, cool and make up the volume to 1000 ml.