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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 809

CHEMICAL ANALYSIS OF MAGNESIUM AND MAGNESIUM ALLOYS

PHOTOMETRIC DETERMINATION OF MANGANESE

PERIODATE METHOD

(Manganese content between 0.01 and 0.8 %)

1st EDITION
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BRIEF HISTORY

The ISO Recommendation R 809, *Chemical analysis of magnesium and magnesium alloys – Photometric determination of manganese – Periodate method (Manganese content between 0.01 and 0.8 %)*, 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 1957 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In December 1966, this Draft ISO Recommendation (No. 1130) 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 :

Argentina	India	South Africa,
Austria	Ireland	Rep. of
Belgium	Israel	Spain
Bulgaria	Italy	Sweden
Canada	Japan	Switzerland
Chile	Korea, Rep. of	Turkey
Czechoslovakia	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Germany	Norway	U.S.S.R.
Hungary	Poland	Yugoslavia

No Member Body opposed the approval of the Draft.

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

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1. SCOPE

This ISO Recommendation describes a photometric method for the determination of manganese in magnesium and magnesium alloys which do not contain zirconium, rare earths, or thorium.

The method is applicable to the determination of manganese content between 0.01 and 0.8 %.

2. PRINCIPLE

- 2.1 Attack of the sample with sulphuric acid, followed by oxidation with nitric acid.
- 2.2 Oxidation of manganese (II) to manganese (VII) by means of potassium periodate (acidity approximately 5N), in the presence of phosphoric acid.
- 2.3 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 *Potassium periodate* (KIO_4).
- 3.2 *Sulphuric acid*, $d = 1.26$ (approximately 9 N).
Carefully add 25 ml of sulphuric acid, $d = 1.84$ (approximately 35.6 N), to water, cool and make up the volume to 100 ml.
- 3.3 *Nitric acid*, $d = 1.40$ (approximately 15 N).
The acid should be free from nitric fumes. To eliminate these fumes, boil for a short while or pass through it a current of carbon dioxide.
- 3.4 *Phosphoric acid*, $d = 1.71$ (approximately 45 N).
- 3.5 *Hydrofluoric acid*, 40 % ($d =$ approximately 1.15).
- 3.6 *Water free from reducing agents*

Bring to the boil water acidified with 10 ml per litre of sulphuric acid (3.2); add a few crystals of potassium periodate (3.1) and maintain at boiling point for approximately 10 minutes. (The term "water" without qualification indicates doubly distilled water.)