
INTERNATIONAL STANDARD



2992

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Ammonium sulphate for industrial use — Determination of iron content — 2,2'-bipyridyl photometric method

Sulfate d'ammonium à usage industriel — Dosage du fer — Méthode photométrique au 2,2'-bipyridyle

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FOREWORD

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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 2992 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in November 1972.

It has been approved by the Member Bodies of the following countries :

Australia	Hungary	South Africa, Rep. of
Austria	India	Spain
Belgium	Israel	Sweden
Bulgaria	Italy	Switzerland
Czechoslovakia	Netherlands	Thailand
Egypt, Arab Rep. of	New Zealand	Turkey
France	Poland	United Kingdom
Germany	Romania	U.S.S.R.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

No Member Body expressed disapproval of the document.

Ammonium sulphate for industrial use – Determination of iron content – 2,2'-bipyridyl photometric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a 2,2'-bipyridyl photometric method for the determination of the iron content of ammonium sulphate for industrial use. The method is applicable to iron (Fe) contents equal to or greater than 0,000 1 % (*m/m*).

2 PRINCIPLE

Reduction of trivalent iron by hydroxylammonium chloride. Formation of the complex between divalent iron and 2,2'-bipyridyl in a buffered medium (pH value between 4,5 and 6).

Photometric measurement of the coloured complex at a wavelength of about 522 nm.

3 REAGENTS

Distilled water, or water of equivalent purity, shall be used in the test.

3.1 Hydrochloric acid, approximately N solution.

3.2 Hydroxylammonium chloride, 100 g/l solution.

Dissolve 10 g of hydroxylammonium chloride ($\text{NH}_2\text{OH}\cdot\text{HCl}$) in water, dilute to 100 ml and mix.

3.3 Ammonium acetate, 300 g/l solution.

Dissolve 30 g of ammonium acetate ($\text{CH}_3\text{COONH}_4$) in water, dilute to 100 ml and mix.

3.4 2,2'-bipyridyl, 10 g/l solution in hydrochloric acid.

Dissolve 1 g of 2,2'-bipyridyl in 10 ml of the hydrochloric acid solution (3.1), dilute to 100 ml and mix.

3.5 Standard iron solution corresponding to 2 g of Fe per litre.

Weigh, to the nearest 0,001 g, 7,030 g of ammonium iron(II) sulphate hexahydrate and place in a beaker of suitable capacity. Add 50 ml of a 100 g/l sulphuric acid

solution and transfer quantitatively to a 500 ml one-mark volumetric flask. Dilute to the mark and mix.

1 ml of this standard solution contains 2 mg of Fe.

3.6 Standard iron solution corresponding to 0,2 g of Fe per litre.

Introduce 50,0 ml of the standard iron solution (3.5) into a 500 ml one-mark volumetric flask, add 5 ml of a 100 g/l sulphuric acid solution, dilute to the mark and mix.

1 ml of this standard solution contains 0,2 mg of Fe.

3.7 Standard iron solution corresponding to 0,01 g of Fe per litre.

Introduce 50,0 ml of the standard iron solution (3.6) into a 1 000 ml one-mark volumetric flask, dilute to the mark and mix.

1 ml of this standard solution contains 10 µg of Fe.

Prepare this solution immediately before it is required for use.

4 APPARATUS

Ordinary laboratory apparatus and

4.1 Spectrophotometer, or

4.2 Photoelectric absorptiometer, fitted with appropriate filters.

5 PROCEDURE

5.1 Test portion

Weigh, to the nearest 0,1 g, about 10 g of the test sample.

5.2 Blank test

Carry out, at the same time as the determination and following the same procedure, a blank test using the same quantities of all the reagents as used for the determination.