# INTERNATIONAL STANDARD ISO 2368

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# Aluminium fluoride for industrial use — Determination of iron content — 1,10-phenanthroline photometric method

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## FOREWORD

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International Standard ISO 2368 was drawn up by Technical Committee ISO/TC 47, *Chemistry.*

It was approved in November 1971 by the Member Bodies of the following countries :

| | | |
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| Austria | Italy | Switzerland |
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India



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# Aluminium fluoride for industrial use — Determination of iron content — 1,10-phenanthroline photometric method



## 1 SCOPE

This International Standard specifies a photometric method, using 1,10-phenanthroline, for the determination of the iron content of aluminium fluoride for industrial use.

## 2 FIELD OF APPLICATION

The method is applicable to the determination of iron contents, expressed as $Fe_2O_3$, greater than 0,020 %, in aluminium fluoride for industrial use.

## 3 REFERENCE

ISO 2925, *Aluminium fluoride for industrial use — Preparation and storage of test samples.* [1)]

## 4 PRINCIPLE

Dissolution of a test portion by either alkaline or acid fusion.

Preliminary reduction of iron(III) by means of hydroxylammonium chloride.

Formation of the iron(II)-1,10-phenanthroline complex in a buffered medium (pH value between 3,5 and 4,2).

Photometric measurement at a wavelength of about 510 nm.

## 5 REAGENTS

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

**5.1 Sodium carbonate,** anhydrous.

**5.2 Boric acid** ($H_3BO_3$).

**5.3 Potassium pyrosulphate** ($K_2S_2O_7$), finely crushed.

**5.4 Nitric acid,** approximately 8 N solution.

Dilute 540 ml of nitric acid, $\rho$ 1,40 g/ml (approximately 68 % (*m/m*) solution), with water, dilute to 1 000 ml and mix.

**5.5 Hydrochloric acid,** approximately 6 N solution.

Dilute 515 ml of hydrochloric acid, $\rho$ 1,19 g/ml (approximately 38 % (*m/m*) solution), with water, dilute to 1 000 ml and mix.

**5.6 Hydroxylammonium chloride,** 10 g/l solution.

Dissolve 10 g of hydroxylammonium chloride ($NH_2OH.HCl$) in water, dilute to 1 000 ml and mix.

**5.7 1,10-phenanthroline hydrochloride,** 2,5 g/l solution.

Dissolve 2,5 g of 1,10-phenanthroline hydrochloride monohydrate ($C_{12}H_8N_2.HCl.H_2O$) in water, dilute to 1 000 ml and mix.

NOTE — 1,10-phenanthroline hydrochloride monohydrate can be replaced by 1,10-phenanthroline monohydrate. If this product is used, it should be dissolved in 10 ml of ethanol 95 % (*V/V*), before adding water.

**5.8 Buffer solution.**

Dissolve 272 g of sodium acetate trihydrate in approximately 500 ml of water.

Add 240 ml of glacial acetic acid, approximately 17,4 N, dilute to 1 000 ml and mix.

**5.9 Sodium acetate,** 500 g/l solution.

Dissolve 50 g of sodium acetate trihydrate in water, dilute to 100 ml and mix.

**5.10 Acetic acid,** dilute solution.

Dilute 500 ml of glacial acetic acid, approximately 17,4 N, with water, dilute to 1 000 ml and mix.

**5.11 Iron** standard solution, with an $Fe_2O_3$ content of 0,200 g/l.

This solution can be prepared by either of the two following methods :

**5.11.1** Weigh, to the nearest 1 mg, 0,982 g of iron(II) ammonium sulphate hexahydrate, $[Fe(NH_4)_2.(SO_4)_2.6H_2O]$. Place in a beaker of suitable capacity (100 ml, for example) and dissolve in water.

1) At present at the stage of draft.