
International Standard



3700

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Anhydrous hydrogen fluoride for industrial use — Determination of water content — Conductimetric method

Fluorure d'hydrogène anhydre à usage industriel — Dosage de l'eau — Méthode conductimétrique

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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 3700 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in November 1978.

It has been approved by the member bodies of the following countries :

Australia	Germany, F. R.	Romania
Belgium	Hungary	South Africa, Rep. of
Brazil	India	Switzerland
Bulgaria	Israel	Thailand
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Egypt, Arab Rep. of	Korea, Rep. of	USSR
France	Netherlands	Yugoslavia

The member body of the following country expressed disapproval of the document on technical grounds :

Austria

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

Anhydrous hydrogen fluoride for industrial use — Determination of water content — Conductimetric method

WARNING — Anhydrous hydrogen fluoride is a highly corrosive liquid which boils at 19,5 °C. It attacks glass, has a great affinity for water and its vapour is irritant and toxic. Its action on the skin and eyes is strongly corrosive, producing severe and painful burns which may not be immediately evident and which respond slowly to treatment.

Samples should be handled only inside a well-ventilated fume cupboard. Rubber gloves, boots and gown of a suitable size to give adequate protection to the individual, and full head and face protection must be worn when handling the material.

In the event of contact or suspected contact, flood with water and seek immediate medical attention. The manufacturer's literature should be consulted for further information.

1 Scope

This International Standard specifies a conductimetric method for the determination of the water content of anhydrous hydrogen fluoride for industrial use. The method is suitable for use as a routine alternative to the reference Karl Fischer method specified in ISO 3699, but may give a lower standard of accuracy.

2 Field of application

The method is applicable to products having water contents between 0,01 and 0,4 % (m/m).

3 References

ISO 3137, *Anhydrous hydrogen fluoride for industrial use — Sampling.*

ISO 3138, *Anhydrous hydrogen fluoride for industrial use — Determination of non-volatile acid content — Titrimetric method.*

ISO 3699, *Anhydrous hydrogen fluoride for industrial use — Determination of water content — Karl Fischer method.*

4 Sampling

Prepare the laboratory sample by the method specified in section 1 of ISO 3137.

5 Principle

Measurement of the conductance of anhydrous hydrogen fluoride using a dip cell electrode. Determination of the corresponding water content by means of a calibration graph making a correction for the non-volatile acid content.

6 Reagents

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

6.1 Propan-2-ol.

6.2 Hydrofluoric acid, approximately 40 % (m/m) aqueous solution.

WARNING — Hydrofluoric acid is toxic and corrosive. Avoid inhalation of fumes. Avoid contact with skin, eyes and clothing.

NOTE — 40 % is the nominal concentration of commercially available hydrofluoric acid solutions. Although the measured concentration may vary from sample to sample, experience indicates that, for the purpose of this determination, such solutions are nevertheless suitable for use in the check test (clause 10).

6.3 Chloroplatinic acid, approximately 30 g/l solution.

Dissolve 4,5 g of chloroplatinic acid hexahydrate ($\text{H}_2\text{PtCl}_6 \cdot 6\text{H}_2\text{O}$) and 0,037 g of lead acetate trihydrate [$(\text{CH}_3\text{COO})_2\text{Pb} \cdot 3\text{H}_2\text{O}$] in 150 ml of water.

6.4 Sulphuric acid, approximately 10 % (m/m) solution.

Carefully add 5,5 ml of sulphuric acid, ρ approximately 1,84 g/ml, to about 80 ml of water and, after cooling, dilute to 100 ml.

6.5 Potassium chloride, standard conductimetric solution, $c(\text{KCl}) = 0,01 \text{ mol/l}$.

Dissolve $0,7455 \pm 0,0002 \text{ g}$ of potassium chloride, previously dried at about 110 °C for 2 h and cooled in a desiccator, in 1 000 ml of water.