BS ISO 12926:2012

BSI Standards Publication

Aluminium fluoride for industrial use — Determination of trace elements — Wavelength dispersive X-ray fluorescence spectrometric method using pressed powder tablets

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National foreword

This British Standard is the UK implementation of ISO 12926:2012.

The UK participation in its preparation was entrusted to Technical Committee CII/24, Raw materials for the aluminium industry.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Aluminium fluoride for industrial use — Determination of trace elements — Wavelength dispersive X-ray fluorescence spectrometric method using pressed powder tablets

Fluorure d'aluminium à usage industriel — Détermination d'éléments traces — Méthode par spectrométrie de fluorescence des rayons X à dispersion de longueur d'onde utilisant des pastilles de poudre pressée

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12926 was prepared by Technical Committee ISO/TC 226, *Materials for the production of primary aluminium*.

Introduction

Aluminium fluoride is used as an electrolyte additive to the aluminium smelting bath to regulate the acidity, or excess aluminium fluoride, level of the electrolyte. This use is critical in the operation of all electrolysis cells used for the production of aluminium. Aluminium fluoride is also used in the cast house as an additive to metal in crucibles in the Treatment of Aluminium in a Crucible process (TAC).

Aluminium fluoride for industrial use — Determination of trace elements — Wavelength dispersive X-ray fluorescence spectrometric method using pressed powder tablets

1 Scope

This International Standard describes an X-ray fluorescence spectrometric (XRF) method for the determination of aluminium fluoride (AlF_3) from the content of fluorine and the content of trace elements in the test specimen. The method does not determine the oxygen content. The calibration reference materials are not specified in this method.

The method is applicable to industrial-grade aluminium fluoride where the concentration range for aluminium fluoride and each trace element is within the concentration range given in Table 1. The validity and precision of test results for concentrations outside these ranges has not been determined (see Note).

Table 1 — Concentration range for aluminium fluoride (from fluorine) and trace elements

Compound or element	Symbol	Concentration range mass %
Aluminium fluoride	AlF_3	86,5 to 95,75
Sodium	Na	0,05 to 0,25
Silicon	Si	0,001 to 0,14
Phosphorus	P	0,001 to 0,02
Sulfur	S	0,01 to 0,6
Calcium	Ca	0,001 to 0,10
Iron	Fe	0,005 to 0,05

NOTE The determination of fluorine has an uncertainty due to mineralogical variation among origins of aluminium fluoride. Batches from different origins with the same fluorine contents can give different intensities when determined by this method and pressed tablet preparation does not eliminate this problem. An AlF_3 sample of unusual mineralogical origin should be tested with an absolute method to verify that, when using this test method, the fluorine concentration range reported is valid.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1619, *Cryolite, natural and artificial — Preparation and storage of test samples*

3 Principle

A representative sample of aluminium fluoride is milled. A test portion is packed and pressed on a powder tablet press to make the test tablets.

The test tablets are analysed on an X-ray fluorescence spectrometer instrument that has been calibrated using a series of aluminium fluoride reference materials covering the required concentration range of the elements to be determined.