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**Sodium fluoride for industrial use — Determination of
fluorine content — Modified Willard-Winter method**

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FOREWORD

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International Standard ISO 2833 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in June 1972.

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

Australia	Italy	Sweden
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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.

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Sodium fluoride for industrial use – Determination of fluorine content – Modified Willard-Winter method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a modified Willard-Winter method for the determination of fluorine content of sodium fluoride for industrial use.

2 REFERENCE

ISO . . ., *Sodium fluoride for industrial use – Preparation and storage of test samples.*¹⁾

3 PRINCIPLE

Separation of the fluorine from a test portion by distillation with sulphuric acid or perchloric acid. Titration with thorium nitrate solution using sodium alizarin-sulphonate and methylene blue as indicators.

Alternatively the thorium nitrate titration may be carried out using sodium alizarin-sulphonate alone as indicator, the end-point being determined spectrophotometrically under carefully defined conditions when the absorbance at 525 nm reaches the arbitrary value of 0,60.

4 REAGENTS

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

4.1 Hydrochloric acid, approximately 0,06 N solution.

Dilute 5 ml of hydrochloric acid, ρ approximately 1,19 g/ml, about 38 % (m/m) solution, with water to 1 000 ml.

4.2 Sodium hydroxide, 20 g/l solution.

4.3 Sulphuric acid, approximately 24 N solution.

Carefully add, in small quantities, 200 ml of sulphuric acid, ρ approximately 1,84 g/ml, about 96 % (m/m) solution, to approximately 100 ml of water and, after cooling, dilute to 300 ml.

or

4.3.1 Perchloric acid, ρ approximately 1,60 g/ml, about 64,5 % (m/m) solution.

4.4 Buffer solution, pH 2,7

Dissolve 9,45 g of monochloroacetic acid in 50 ml of N sodium hydroxide solution and dilute to 100 ml.

4.5 Thorium nitrate, approximately 0,067 N standard volumetric solution.

1 ml of this solution is equivalent to approximately 1,3 mg of fluorine (F).

4.5.1 Preparation of the solution

Dissolve 9,45 g of thorium nitrate tetrahydrate $[\text{Th}(\text{NO}_3)_4 \cdot 4\text{H}_2\text{O}]$ or the corresponding mass of other hydrates in water and dilute to 1 000 ml.

4.5.2 Standardization of the solution

4.5.2.1 PREPARATION OF THE STANDARD REFERENCE SOLUTION

Weigh, to the nearest 0,000 1 g, about 0,2 g of extra pure anhydrous sodium fluoride, previously heated at 600 °C in a platinum dish and cooled in a desiccator. Transfer, using 20 to 30 ml of water, into the distillation flask (5.2.1) containing several glass balls (2 to 3 mm diameter).

1) In preparation.