
International Standard



3946

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Starches and derived products — Determination of total phosphorus content — Spectrophotometric method

Amidons, fécules et produits dérivés — Détermination de la teneur en phosphore total — Méthode spectrophotométrique

First edition — 1982-12-01

Sample Document

get full document from standards.iteh.ai

UDC 664.2 : 543.847

Ref. No. ISO 3946-1982 (E)

Descriptors : starches, chemical analysis, determination of content, phosphorus, spectrophotometric analysis.

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 3946 was developed by Technical Committee ISO/TC 93, *Starch (including derivatives and by-products)*, and was circulated to the member bodies in February 1982.

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

Austria	Netherlands	USA
Egypt, Arab Rep. of	Poland	USSR
France	Portugal	
Germany, F.R.	South Africa, Rep. of	

No member body expressed disapproval of the document.

Starches and derived products — Determination of total phosphorus content — Spectrophotometric method

1 Scope and field of application

This International Standard specifies a spectrophotometric method for the determination of the total phosphorus content of starch, including derivatives and by-products, in which the expected content, calculated as phosphorus (P), does not exceed 5 % (*m/m*).

2 Definition

total phosphorus content: The quantity of phosphorus determined in accordance with the conditions specified in this International Standard and expressed as phosphorus (P) as a percentage by mass of the product as received.

3 Principle

Destruction of the organic substances by digestion with a sulpho-nitric mixture and conversion of phosphates to ortho-phosphates.

Formation, by means of a reducing agent, of a phosphomolybdate known as molybdenum blue.

Spectrophotometric measurement of the intensity of the blue colour at a wavelength of 825 nm.

4 Reagents

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

4.1 Sulpho-nitric reagent.

Prepared by mixing 1 part by volume of sulphuric acid, ρ_{20} 1,84 g/ml, 96 % (*m/m*) solution, and 1 part by volume of nitric acid, ρ_{20} 1,38 g/ml, 65 % (*m/m*) solution.

4.2 Nitric acid, ρ_{20} 1,38 g/ml, 65 % (*m/m*) solution.

4.3 Ascorbic acid, 50 g/l solution.

Keep this solution in a refrigerator for a maximum of 48 h.

4.4 Ammonium molybdate solution, prepared as follows.

In a 1 l flask, dissolve 10,6 g of ammonium molybdate tetrahydrate $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}\cdot 4\text{H}_2\text{O}]$ in 500 ml of water.

Add 500 ml of 10 mol/l sulphuric acid solution, mix and allow to cool to ambient temperature.

4.5 Sodium hydroxide, 10 mol/l solution.

4.6 Phosphorus, standard solutions.

4.6.1 Stock solution, corresponding to 100 mg of P per litre.

Weigh, to the nearest 0,5 mg, 0,439 3 g of anhydrous potassium dihydrogenorthophosphate and dissolve in water. Transfer quantitatively into a 1 000 ml one-mark volumetric flask.

Dilute to the mark with water and mix.

1 ml of this standard solution contains 100 μg of P.

NOTE — The potassium dihydrogenorthophosphate shall be dried before use for 1 h, in a drying oven controlled at 105 ± 2 °C, and then allowed to cool in a desiccator.

4.6.2 Standard solution, corresponding to 4 mg of P per litre.

Using a pipette, take 10 ml of the stock solution (4.6.1) and place it in a 250 ml one-mark volumetric flask.

Dilute to the mark with water and mix.

1 ml of this standard solution contains 4 μg of P.

5 Apparatus

NOTE — Ensure that the detergents used for cleaning glassware do not contain phosphorus.

Ordinary laboratory apparatus, and in particular

5.1 One-mark volumetric flasks, of capacities 50 - 100 - 200 - 250 and 500 ml, complying with the requirements of ISO 1042.