



# SLOVENSKI STANDARD

## SIST EN ISO 5810:1998

01-november-1998

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### Škrob in škrobni derivati - Določevanje klorida - Potenciometrijska metoda

Starches and derived products - Determination of chloride content - Potentiometric method

Stärke und Stärkederivate - Bestimmung des Chloridgehaltes - Potentiometrisches Verfahren

Amidons, fécules et produits dérivés - Détermination de la teneur en chlorures - Méthode potentiométrique

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#### **ICS:**

67.180.20      Škrob in izdelki iz njega      Starch and derived products

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EUROPEAN STANDARD

EN ISO 5810

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 1994

UDC 664.2:543.257:546.131

Descriptors: Starches, chemical analysis, determination of content, chlorides, potentiometric analysis

English version

**Starches and derived products - Determination of  
chloride content - Potentiometric method**

Amidons, fécules et produits dérivés  
Détermination de la teneur en chlorures -  
Méthode potentiométrique

Stärke und Stärkederivate - Bestimmung des  
Chloridgehaltes - Potentiometrisches Verfahren

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This European Standard was approved by CEN on 1994-09-06. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

The text of the International Standard ISO 5810:1982, was prepared by ISO/TC 93 "Starch (including derivatives and by-products)", was submitted to Formal Vote and was approved by CEN as EN ISO 5810 on 1994-09-06 without any modification.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 1995, and conflicting national standards shall be withdrawn at the latest by March 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

## Endorsement notice

The text of the International Standard ISO 5810:1982 was approved by CEN as a European Standard without any modification.

**NOTE:** Normative references to international publications are listed in annex ZA (normative)

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International Standard



5810

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## Starches and derived products — Determination of chloride content — Potentiometric method

*Amidons, fécules et produits dérivés — Détermination de la teneur en chlorures — Méthode potentiométrique*

First edition — 1982-12-01

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Ref. No. ISO 5810-1982 (E)

**Descriptors** : starches, chemical analysis, determination of content, chlorides, potentiometric analysis.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 5810 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	Portugal	USSR
France	Romania	
Germany, F.R.	South Africa, Rep. of	

No member body expressed disapproval of the document.

# Starches and derived products – Determination of chloride content – Potentiometric method

## 1 Scope and field of application

This International Standard specifies a potentiometric method for the determination of the chloride content of starches and derived products, except cationic starches and amyloids soluble when cold, the viscosity of these being too high to allow for correct stirring when titrating.

## 2 Principle

Potentiometric titration of a solution or suspension of the sample using a standard volumetric silver nitrate solution.

## 3 Reagents

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

**3.1 Nitric acid**, concentrated,  $\rho_{20}$  1,41 g/ml, containing 70 % (m/m) of  $\text{HNO}_3$ .

**3.2 Silver nitrate**, standard volumetric solution,  $c(\text{AgNO}_3) = 0,05 \text{ mol/l}^{(1)}$  or  $0,02 \text{ mol/l}^{(1)}$ .

## 4 Apparatus

Ordinary laboratory apparatus, and in particular

**4.1 Beakers**, of capacity 250 ml.

**4.2 One-mark pipettes**, of capacity 1 ml, complying with the requirements of ISO 648.

**4.3 Burettes**, of capacity 10 ml, complying with the requirements of ISO 385/2.

**4.4 Analytical balance**.

**4.5 Potentiometer or pH-meter**, the scale of which shall be graduated in millivolts, and calibrated according to the manufacturer's instructions.

## 4.6 Electrodes.

### 4.6.1 Silver/silver chloride electrode.

This may be purchased or may be prepared from a silver electrode as follows:

— Immerse the silver electrode in an approximately  $0,1 \text{ mol/l}^{(2)}$  potassium chloride solution and connect it to the positive pole of a 4 V battery.

— Connect the negative pole to a second silver or platinum electrode and pass the current through for about 5 min until the surface of the positive electrode becomes dark in colour. Wash this positive electrode carefully with water and keep in water until required for use.

### 4.6.2 Reference electrode.

Use an appropriate electrode system for the potentiometric determination of chloride (such systems are commercially available).

## 4.7 Variable speed stirrer.

## 5 Procedure

### 5.1 Preparation of test sample

Mix the sample thoroughly in order to make it homogeneous.

### 5.2 Test portion

Weigh, to the nearest 0,001 g, a suitable mass of test sample selected, according to the expected chloride content, from the following table:

Expected chloride content % (m/m) NaCl	Mass of test portion g
less than 0,05	25
0,05 to 0,2	15
0,2 to 0,5	5
0,5 to 1	2,5
1 to 5	0,5

1) Hitherto designated "0,05 N and 0,02 N standard volumetric solutions" respectively.

2) Hitherto designated "0,1 N solution".

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**5.3 Preparation of test solution or suspension**

**5.3.1** Transfer the test portion (5.2) to the titration beaker (4.1) containing 100 ml of water and the rod of the stirrer, while stirring.

**5.3.2** For soluble products, stir until the test portion is dissolved, cool if necessary (bring to ambient temperature when titrating).

**5.3.3** For insoluble products, stir until a homogeneous suspension is obtained and stir for a further 15 min.

**5.4 Determination**

Immerse the electrodes in the test solution or suspension (5.3), the silver/silver chloride electrode (4.6.1) being connected to the positive pole of the measuring apparatus (4.5) and the reference electrode (4.6.2) to the negative pole. Stir and add, by means of a pipette (4.2), 1 ml of the nitric acid (3.1).

Titrate the contents of the beaker with the silver nitrate solution (3.2)<sup>1)</sup>, adding amounts of 1 ml and 0,2 ml as the end-point approaches.

Allow the reading to stabilize after each addition.

Trace the potentiometric curve as a function of the volume of the silver nitrate solution added. Take as the end-point the point of inflection of the curve. Note the volume  $V$  of silver nitrate solution corresponding to the end-point.

Carry out two determinations on the same test sample (5.1).

**6 Expression of results****6.1 Method of calculation and formulae**

The chloride content, expressed as sodium chloride as a percentage by mass, is given by the formula

$$\frac{0,058\ 45 \times c \times V \times 100}{m}$$

where

$c$  is the exact concentration, in moles per litre, of the silver nitrate solution (3.2);

$V$  is the volume, in millilitres, of the silver nitrate solution used for the determination (5.4);

$m$  is the mass, in grams, of the test portion (5.2).

Take as result the arithmetic mean of the values obtained in two determinations provided that the conditions of repeatability (see 6.2) are fulfilled. If not, repeat the test.

**6.2 Repeatability**

The difference between the values obtained in two determinations carried out simultaneously or in rapid succession on the same sample shall not be more than

- 2,5 % of the arithmetic mean in the case of chloride contents greater than 1 % ( $m/m$ );
- 0,03 g per 100 g of product in the case of chloride contents less than 1 % ( $m/m$ ).

**6.3 Reproducibility**

The difference between the values obtained in two determinations carried out on the same sample in two different laboratories shall not be more than

- 10 % of the arithmetic mean in the case of chloride contents greater than 1 % ( $m/m$ );
- 0,1 g per 100 g of product in the case of chloride contents less than 1 % ( $m/m$ ).

**7 Test report**

The test report shall indicate the method used, together with the result obtained and the method of expression used. It shall also mention any operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances which may have affected the results.

The test report shall include all details required for the complete identification of the sample.

1) It is preferable to use the 0,02 mol/l solution for chloride contents less than 0,05 % ( $m/m$ ).