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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Cheese and processed cheese products — Determination of chloride content — Potentiometric titration method

iTeh STANDARD PREVIEW

Fromages et fromages fondus — Détermination de la teneur en chlorures — Méthode par titrage potentiométrique
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Reference number
ISO 5943 : 1988 (E)

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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5943 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, in collaboration with the International Dairy Federation (IDF) and the Association of Official Analytical Chemists (AOAC), and will also be published by these organizations.

This second edition cancels and replaces the first edition (ISO 5943 : 1978), of which it constitutes a minor revision.

Cheese and processed cheese products — Determination of chloride content — Potentiometric titration method

1 Scope

This International Standard specifies a potentiometric titration method for the determination of the chloride content of cheese and processed cheese products.

The method is applicable to all cheeses and processed cheese products containing more than 0,2 % (*m/m*) of chloride ion.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 707 : 1985, *Milk and milk products — Sampling*.

3 Definition

For the purposes of this International Standard, the following definition applies.

chloride content of cheese and processed cheese products: The mass fraction of substances determined by the procedure specified in this International Standard.

It is expressed as a percentage by mass of chloride ion or sodium chloride or any other chloride.

4 Principle

Suspension of a test portion in water. Acidification with nitric acid and subsequent potentiometric titration of chloride ion with standard volumetric silver nitrate solution.

5 Reagents

All reagents shall be of recognized analytical grade. The water used shall be distilled water or water of at least equivalent purity.

5.1 Silver nitrate, 0,08 mol/l to 0,12 mol/l standard volumetric solution.

Dissolve 13,6 g to 20,4 g of silver nitrate (AgNO_3) in water which is practically free from carbon dioxide and dilute to 1 000 ml. Standardize the solution against sodium chloride (NaCl), which has previously been dried at 300 °C, expressing the concentration of the silver nitrate solution to four decimal places.

Store the solution away from direct sunlight.

5.2 Nitric acid, approximately 4 mol/l solution.

6 Apparatus

6.1 Device for grinding or grating cheese, capable of being cleaned easily.

6.2 Analytical balance.

6.3 Blender.

6.4 Potentiometer, provided with a measuring electrode suitable for the determination of chloride (for example a silver electrode) and a reference electrode [for example a mercury(II) sulfate electrode].

6.5 Vessel, suitable for blending and titrating.

6.6 Graduated cylinders, of 50 ml and 10 ml capacity.

6.7 Burette, graduated in divisions of 0,1 ml, of 50 ml capacity, or an **automatic plunger burette**, readable to the nearest 0,01 ml. The burette, or automatic plunger burette, should preferably be made of brown glass.

6.8 Stirrer.

7 Sampling

Sampling shall be carried out in accordance with ISO 707.

8 Preparation of the test sample

Prior to analysis, remove the rind or smear or mouldy surface layer of the cheese, in such a way as to provide a sample representative of the cheese as it is usually consumed. Grind or grate the sample by means of an appropriate device (6.1); mix the ground or grated mass quickly, and if possible grind or grate a second time and again mix thoroughly. If the sample cannot be ground or grated, mix it thoroughly by intensive stirring and kneading.

Transfer the test sample to an airtight container to await analysis, which should be carried out as soon as possible after grinding. If delay is unavoidable, take all precautions to ensure proper preservation of the sample and to prevent condensation of moisture on the inside surface of the container. The storage temperature should be 10 °C to 12 °C.

Clean the device after grinding or grating each sample.

9 Procedure

9.1 Test portion

Weigh, to the nearest 0,001 g, 2 g to 5 g of the test sample (clause 8) into the vessel (6.5).

9.2 Determination

9.2.1 Add 30 ml of water at about 55 °C. Suspend the test portion using the blender (6.3). Rinse the blender with approximately 10 ml of water, collecting the rinsings in the vessel.

9.2.2 Add 2 ml to 3 ml of the nitric acid solution (5.2). Put the measuring electrode and the reference electrode into the suspension.

Titrate the contents of the vessel with the standard volumetric silver nitrate solution (5.1) from the burette (6.7), stirring continuously, until the end point has nearly been reached. Then titrate cautiously until reaching the end point, which corresponds to the maximum potential difference observed between two successive equal additions (of about 0,05 ml) of the silver nitrate solution.

9.3 Blank test

Carry out a blank test using the reagents but omitting the test portion.

10 Expression of results

10.1 Method of calculation

Calculate the chloride content, as a percentage by mass, by means of the formula

$$\frac{(V_1 - V_0) \times c \times f}{m}$$

where

V_0 is the volume, in millilitres, of the standard volumetric silver nitrate solution used in the blank test;

V_1 is the volume, in millilitres, of the standard volumetric silver nitrate solution used in the determination;

c is the actual concentration, expressed in moles per litre, of the standard volumetric silver nitrate solution;

m is the mass, in grams, of the test portion;

f is the factor for expressing the result as a percentage of any chloride.

The numerical values are, for example,

$$f = 3,55 \text{ for expression as } \% \text{ Cl}^-$$

$$f = 5,84 \text{ for expression as } \% \text{ NaCl}$$

$$f = 7,46 \text{ for expression as } \% \text{ KCl}$$

Report the result to the second decimal place.

10.2 Precision

NOTE — The values for repeatability and reproducibility are expressed at the 95 % probability level and were derived from the results of an inter-laboratory test [see POORTVLIET, L.J. and HORWITZ, W. *J. Assoc. Off. Anal. Chem.* **65** (1982) p. 1350] carried out in accordance with ISO 5725 : 1986, *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests*.

10.2.1 Repeatability

The difference between two single results found on identical test material by one analyst using the same apparatus within a short time interval should not exceed 0,02 g of Cl^- ion (or the equivalent quantity of any chloride) per 100 g of product.

10.2.2 Reproducibility

The difference between two single and independent results found by two operators working in different laboratories on identical test material should not exceed 0,06 g of Cl^- ion (or the equivalent quantity of any chloride) per 100 g of product.

11 Test report

The test report shall specify the method used and the result obtained. It shall also mention all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents which may have influenced the result.

The test report shall include all information necessary for the complete identification of the sample.

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