

# Soaps — Determination of chloride content — Titrimetric method

## 1 Scope and field of application

This International Standard specifies a method for determining the chloride content of commercial soaps, excluding compounded products; this method is applicable to soaps having a chloride content, expressed as sodium chloride, equal to or greater than 0,1 % (m/m).<sup>1)</sup>

## 2 Principle

Determination of the chloride content by argentimetric titration after decomposition of a test portion and separation of fatty acids by filtration.

## 3 Reagents

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

**3.1 Nitric acid**,  $\rho$  approximately 1,42 g/ml, about 70 to 80 % (m/m) solution, which has been boiled until colourless.

**3.2 Ammonium iron(III) sulfate**, about 10 % (m/m) solution.

**3.3 Ammonium thiocyanate**, standard volumetric solution,  $c(\text{NH}_4\text{SCN}) \approx 0,1 \text{ mol/l}$ .

**3.4 Silver nitrate**, standard volumetric solution,  $c(\text{AgNO}_3) \approx 0,1 \text{ mol/l}$ .

## 4 Apparatus

Ordinary laboratory apparatus, and in particular :

**4.1 Beaker**, capacity 100 ml, tall form, complying with the requirements of ISO 3819.

**4.2 One-mark volumetric flask**, capacity 200 ml, complying with the requirements of ISO 1042.

**4.3 Boiling water bath.**

## 5 Sampling

Sampling of soaps will form the object of a future International Standard.

## 6 Procedure

### 6.1 Test portion

Weigh, to the nearest 0,01 g, approximately 5 g of the laboratory sample into the beaker (4.1).

### 6.2 Determination

Dissolve the test portion (6.1) in 50 ml of hot water. Transfer the solution quantitatively to the one-mark volumetric flask (4.2), effecting this by washing with small portions of water. Add 5 ml of the nitric acid solution (3.1), and immediately add 25,0 ml of the silver nitrate solution (3.4). Place the flask on the

1) The potentiometric method specified in ISO 4323 can be used for products having a chloride content, expressed as sodium chloride, higher or lower than 0,1 % (m/m).

boiling water bath (4.3) until the fatty acids are completely separated and the silver chloride formed has collected in a mass. Cool the one-mark volumetric flask and contents to room temperature and dilute to the mark with water. Mix by shaking and filter through a dry, fluted filter paper. Discard the first 10 ml, and then collect at least 110 ml, of the filtrate. Transfer, using a pipette, 100,0 ml to a conical flask, add 2 to 3 ml of the ammonium iron(III) sulfate solution (3.2) and titrate with the standard volumetric ammonium thiocyanate solution (3.3), shaking the conical flask vigorously, until the appearance of a permanent reddish-brown coloration.

## 7 Expression of results

### 7.1 Method of calculation

The chloride content of the soap, expressed as a percentage by mass of sodium chloride (NaCl), is given by the formula

$$0,058\ 5 \times (25\ c_1 - 2\ Vc_2) \times \frac{100}{m}$$

and, as a percentage by mass of potassium chloride (KCl), by the formula

$$0,074\ 6 \times (25\ c_1 - 2\ Vc_2) \times \frac{100}{m}$$

where

$m$  is the mass, in grams, of the test portion (6.1);

$V$  is the volume, in millilitres, of the standard volumetric ammonium thiocyanate solution (3.3) used;

$c_1$  is the actual concentration, expressed in moles of  $\text{AgNO}_3$  per litre, of the silver nitrate solution (3.4);

$c_2$  is the actual concentration, expressed in moles of  $\text{NH}_4\text{SCN}$  per litre, of the ammonium thiocyanate solution (3.3);

0,058 5 is the mass, in grams, of sodium chloride corresponding to 1,00 ml of the silver nitrate solution,  $c(\text{AgNO}_3) = 1,000\ \text{mol/l}$ ;

0,074 6 is the mass, in grams, of potassium chloride corresponding to 1,00 ml of the silver nitrate solution,  $c(\text{AgNO}_3) = 1,000\ \text{mol/l}$ .

### 7.2 Reproducibility

The difference between results obtained on the same sample in two different laboratories should not differ by more than 0,05 % from the value of the percentage by mass of chlorides found, expressed either as sodium chloride or as potassium chloride.

## 8 Test report

The test report shall include the following information :

- all information necessary for the complete identification of the sample;
- the reference of the method used (reference to this International Standard);
- the results and the method of expression used;
- the test conditions;
- any details not specified in this International Standard, or regarded as optional, as well as any incidents likely to have affected the results.