INTERNATIONAL STANDARD 740

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Sodium carbonate for industrial use — Determination of total soluble alkalinity — Titrimetric method

Carbonate de sodium à usage industriel — Détermination de l'alcalinité totale soluble — Méthode titrimétrique

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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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 47 has reviewed ISO Recommendation R 740 and found it technically suitable for transformation. International Standard ISO 740 therefore replaces ISO Recommendation R 740-1968 to which it is technically identical.

ISO Recommendation R 740 was approved by the Member Bodies of the following countries :

Austria	India	Romania
Belgium	Israel	South Africa, Rep. of
Brazil	Italy	Spain
Chile	Japan	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Egypt, Arab Rep. of	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Germany	Poland	U.S.S.R.
Hungary	Portugal	Yugoslavia

No Member Body expressed disapproval of the Recommendation.

No Member Body disapproved the transformation of ISO/R 740 into an International Standard.

Printed in Switzerland

Sodium carbonate for industrial use — Determination of total soluble alkalinity — Titrimetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a titrimetric method for the determination of the total soluble alkalinity of sodium carbonate for industrial use.

2 REFERENCES

ISO 739, *Sodium carbonate for industrial use — Preparation and storage of test samples.*

ISO 745, *Sodium carbonate for industrial use — Determination of loss of mass and of non-volatile matter at 250 °C.*

3 PRINCIPLE

Solution of a test portion, filtration of the solution and titration of the total soluble alkalinity with a standard volumetric solution of hydrochloric acid, using methyl orange as indicator.

4 REAGENTS

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

4.1 Hydrochloric acid, 1 N standard volumetric solution.

4.2 Methyl orange, 0,5 g/l solution.

NOTE — The methyl orange may be replaced by any other indicator giving the same end-point.

5 APPARATUS

Ordinary laboratory apparatus.

6 PROCEDURE

6.1 Test portion

Weigh, to the nearest 0,01 g, a mass of the test sample (see ISO 739) of 50 ± 0,1 g, 59 ± 0,1 g, 110 ± 0,1 g or 135 ± 0,1 g, depending on whether the product is anhydrous or mono-, hepta- or decahydrate.

6.2 Preparation of test solution

Dissolve the test portion (6.1) by pouring it in small quantities at a time, while stirring, into a beaker of suitable capacity (for example 600 ml) containing 200 ml of water at about 50 °C.

Filter the decanted solution through a medium-speed filter, collecting the filtrate in a 500 ml one-mark volumetric flask.

Wash the insoluble matter onto the filter with water at about 50 °C. Complete the washing, collecting all the washings in the volumetric flask. Allow to cool, dilute to the mark and mix.

6.3 Titration

Transfer 25,0 ml of the test solution (6.2) to a 500 ml conical flask. Add approximately 75 ml of water, 5 drops of the methyl orange solution (4.2) and titrate with the standard volumetric hydrochloric acid solution (4.1) until the indicator turns from yellow to orange-pink.

NOTE — If required, this determination may also be carried out by means of back-titration, using 1 N standard volumetric hydrochloric acid solution and 1 N or 0,1 N standard volumetric sodium hydroxide solution. If this method is adopted, it shall be taken into account in the calculation of results.

7 EXPRESSION OF RESULTS

The total soluble alkalinity, expressed as a percentage by mass of sodium carbonate (Na_2CO_3), is given by the formula :

$$V \times \frac{500}{25} \times \frac{100}{m} \times 0{,}053\,0 = 106\,\frac{V}{m}$$

where

V is the volume, in millilitres, of the standard volumetric hydrochloric acid solution (4.1) used for the titration;

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

0,053 0 is the mass, in grams, of sodium carbonate equivalent to 1 ml of exactly 1 N standard volumetric hydrochloric acid solution.

NOTES

1 If the concentration of the standard volumetric solution used is not exactly as specified in the list of reagents, an appropriate correction should be made.

2 If it is desired to express the result on the basis of non-volatile matter at 250 °C (see ISO 745), multiply the result obtained on the product as received by the ratio

$$\frac{100}{100 - \text{loss of mass at } 250\,^{\circ}\text{C in \% } (m/m)}$$