INTERNATIONAL STANDARD 1692

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

Sodium and potassium silicates for industrial use — Determination of total alkalinity — Titrimetric method

Silicates de sodium et de potassium à usage industriel — Détermination de l'alcalinité totale — 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 1692 and found it technically suitable for transformation. International Standard ISO 1692 therefore replaces ISO Recommendation R 1692-1970 to which it is technically identical.

ISO Recommendation R 1692 was approved by the Member Bodies of the following countries :

Australia	Hungary	Portugal
Austria	India	Romania
Belgium	Iran	South Africa, Rep. of
Brazil	Israel	Spain
Colombia	Italy	Switzerland
Czechoslovakia	Japan	Thailand
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Peru	U.S.S.R.
Greece	Poland	Yugoslavia

No Member Body expressed disapproval of the Recommendation.

No Member Body disapproved the transformation of ISO/R 1692 into an International Standard.

Printed in Switzerland

Sodium and potassium silicates for industrial use — Determination of total alkalinity — Titrimetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a titrimetric method for the determination of the total alkalinity of sodium and potassium silicates for industrial use.

2 REFERENCES

ISO 1686, *Sodium and potassium silicates for industrial use — Samples and methods of test — General.*

ISO 1690, *Sodium and potassium silicates for industrial use — Determination of silica content — Gravimetric method by insolubilization.*

ISO 2122, *Sodium and potassium silicates for industrial use — Preparation of solutions of products not easily soluble in boiling water and determination of matter insoluble in water.*

3 PRINCIPLE

Titration of the total alkalinity of a test portion with a standard volumetric solution of hydrochloric acid, in the presence of methyl orange as indicator.

4 REAGENTS

During the analysis, use only reagents of recognized analytical 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 having the end-point in the same pH range.

5 APPARATUS

Ordinary laboratory apparatus.

6 PROCEDURE

6.1 Test portion

Weigh, to the nearest 0,01 g, 10 ± 1 g of the test sample (see ISO 1686).

NOTES

1 Where the silica content is also to be determined, the test portion will be constituted by the aliquot of the test solution prepared according to ISO 1690.

2 In the case of products not easily soluble in boiling water, the test sample will be constituted by the test solution prepared according to ISO 2122.

6.2 Preparation of test solution

Place the test portion (6.1) in a 250 ml one-mark volumetric flask, dissolve with water, dilute to the mark and mix.

6.3 Determination

Take a volume of the sample solution (6.2) such that the volume of the standard volumetric hydrochloric acid solution (4.1) required to neutralize it is about 20 ml.

Add 5 drops of the methyl orange solution (4.2) and titrate with the standard volumetric hydrochloric acid solution until the indicator changes from yellow to orange-pink.

7 EXPRESSION OF RESULTS

The total alkalinity, expressed as a percentage by mass of sodium oxide (Na_2O) or of potassium oxide (K_2O), as appropriate, is given by the formulae

Sodium oxide (in the case of sodium silicates)

$$V \times \frac{100}{m} \times 0{,}031\,0 = 3{,}10 \times \frac{V}{m}$$

Potassium oxide (in the case of potassium silicates)

$$V \times \frac{100}{m} \times 0{,}047\ 1 = 4{,}71 \times \frac{V}{m}$$

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 (or the mass, in grams, of test portion contained in the aliquot part of the test solution (5.2) used);

0,031 0 is the mass, in grams, of sodium oxide corresponding to 1 ml of exactly 1 N hydrochloric acid solution;

0,047 1 is the mass, in grams, of potassium oxide corresponding to 1 ml of exactly 1 N hydrochloric acid solution.

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

8 ACCURACY OF THE METHOD

The results obtained using this method are reproducible to the nearest ± 0,2 % (*m/m*), in absolute value.

9 TEST REPORT

The test report shall include the following particulars :

a) the reference of the method used;

b) the results and the method of expression used;

c) any unusual features noted during the determination;

d) any operations not included in this International Standard or the International Standards to which reference is made, or regarded as optional.

ANNEX

ISO PUBLICATIONS RELATING TO SODIUM AND POTASSIUM SILICATES FOR INDUSTRIAL USE

ISO 1686 – Samples and methods of test – General.

ISO 1687 – Determination of density at 20 °C of samples in solution – Method using density hydrometer and method using pyknometer.

ISO 1688 – Determination of dry matter – Gravimetric method.

ISO 1689 – Calculation of the ratio $\frac{SiO_2}{Na_2O}$ or $\frac{SiO_2}{K_2O}$.

ISO 1690 – Determination of silica content – Gravimetric method by insolubilization.

ISO 1691 – Determination of carbonate content – Gas-volumetric method.

ISO 1692 – Determination of total alkalinity – Titrimetric method.

ISO 2122 – Preparation of solution of products not easily soluble in boiling water and determination of matter insoluble in water.

ISO 2123 – Determination of dynamic viscosity.

ISO 2124 – Determination of silica content – Titrimetric method.

ISO 3200 – Determination of sulphate content – Barium sulphate gravimetric method.

ISO 3201 – Determination of iron content – 1,10-Phenanthroline photometric method.