BRITISH STANDARD

BS 6092-5:
1981
ISO 1692:1976

Methods of

Sampling and test for sodium and potassium silicates for industrial use —

Part 5: Determination of total alkali content

[ISO title: Sodium and potassium silicates for industrial use — Determination of total alkalinity — Titrimetric method]

NOTE It is recommended that this Part be read in conjunction with the information in the "*General introduction*" published separately as BS 6092-0.

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National foreword

This Part of BS 6092 is identical with ISO 1692 "*Sodium and potassium silicates for industrial use — Determination of total alkalinity — Titrimetric method*", published in 1976 by the International Organization for Standardization (ISO).

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words "International Standard" appear, referring to this standard, they should be read as "British Standard".

Cross-references

International Standard	Corresponding British Standard
	BS 6092 *Methods of sampling and test for sodium and potassium silicates for industrial use*
ISO 1690:1976	Part 3:1981 *Determination of silica content (gravimetric method)* (Identical)
ISO 2122:1972	Part 6:1981 *Preparation of solutions of not readily soluble products and determination of matter insoluble in water* (Identical)

There is no British Standard corresponding directly to ISO 1686 to which reference is made in **6.1**. Technically equivalent information on sampling is given in BS 6092-0.

The standards listed in the Annex are intended for information only. Corresponding British Standards are listed in BS 6092-0.

Additional information Water complying with the requirements of clause **4** is specified in BS 3978 "*Water for laboratory use*".

In the revised edition of BS 3984:1966 "*Specification for sodium silicates*" details will be given of the volume of sample solution required to give a titration reading of about 20 ml (see **6.3**).

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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).

NOTE 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.

NOTE 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.*

Publications referred to

See national foreword.

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