INTERNATIONAL STANDARD 2124

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

Sodium and potassium silicates for industrial use — Determination of silica content — Titrimetric method

First edition — 1972-06-15

UDC 661.31/.32 : 546.284-31

Ref. No. ISO 2124-1972 (E)

Descriptors : chemical analysis, determination of content, potassium silicates, silicon dioxide, sodium silicates, volumetric analysis.

Price based on 2 pages

FOREWORD

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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.

International Standard ISO 2124 was drawn up by Technical Committee ISO/TC 47, *Chemistry*.

It was approved in March 1971 by the Member Bodies of the following countries:

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

No Member Body expressed disapproval of the document.

Printed in Switzerland

Sodium and potassium silicates for industrial use — Determination of silica content — Titrimetric method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a simple and rapid titrimetric method for the determination of the silica content of sodium and potassium silicates for industrial use.

2 REFERENCES

ISO/R 645, *Statistical vocabulary and symbols — First series of terms and symbols — Part 1 : Statistical vocabulary.*

ISO 2122, *Sodium and potassium silicates for industrial use — Preparation of solution of products not easily soluble in boiling water and determination of matter insoluble in water.* (At present at the stage of Draft).

3 PRINCIPLE

Neutralization of the alkalinity of a test portion, previously dissolved, with methyl red as indicator.

Addition of sodium fluoride, which reacts with the silicic acid, forming an equivalent quantity of sodium hydroxide.

Addition of a measured volume of standard volumetric hydrochloric acid solution in excess, followed by ethanol.

Filtration of the silicic compound thus obtained, which is insoluble under these conditions.

Titration of the excess of acid in the filtrate with standard volumetric sodium hydroxide solution with methyl red as indicator.

4 REACTIONS

$$H_2SiO_3 + 6\,NaF + H_2O \longrightarrow Na_2SiF_6 + 4\,NaOH$$

$$NaOH + HCl \longrightarrow NaCl + H_2O.$$

5 REAGENTS

Distilled water or water of equivalent purity shall be used in the test.

5.1 Sodium fluoride, anhydrous, heated at 600 °C and cooled in a desiccator.

5.2 Ethanol, approximately 95 % (V/V) which may be denatured with ether.

5.3 Ethanol, approximately 50 % (V/V) which may be denatured with ether.

5.4 Hydrochloric acid, N standard volumetric solution.

5.5 Hydrochloric acid, approximately 0.1 N solution.

5.6 Sodium hydroxide, N standard volumetric solution.

5.7 Methyl red, 1 g/l solution in 95 % (V/V) ethanol.

6 APPARATUS

Ordinary laboratory apparatus and

6.1 Burette, 25 ml, graduated in 0.05 ml.

7 PROCEDURE

7.1 Test portion

Weigh, to the nearest 0.1 mg, a quantity of laboratory sample corresponding to 2.0 ± 0.3 g of SiO_2.

NOTE — In the case of products not easily soluble, use an equivalent quantity of the solution prepared according to the method described in ISO 2122.

7.2 Blank test

Place in a 250 ml conical flask, 70 ml of water, 5.00 ml of the sodium hydroxide solution (5.6) and 0.30 ml of the methyl red solution (5.7). Add, by means of a graduated pipette, approximately 4.5 ml of the hydrochloric acid solution (5.4) and neutralize with the hydrochloric acid solution (5.5) until the colour of the indicator turns from yellow to red. Then add 5 ± 0.1 g of the sodium fluoride (5.1) to the solution thus neutralized. Stir to aid dissolution of this product, then add a precisely measured volume (V_3) of the hydrochloric acid solution (5.4) corresponding to an excess of about 5 ml after the colour change to red.