

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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.

International Standard ISO 5935 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in January 1983.

It has been approved by the member bodies of the following countries:

Austria	Hungary	Portugal
Belgium	India	South Africa, Rep. of
China	Italy	Switzerland
Czechoslovakia	New Zealand	United Kingdom
France	Nigeria	USSR
Germany, F.R.	Poland	

The member body of the following country expressed disapproval of the document on technical grounds:

Australia

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

Crude sodium borates for industrial use — Determination of total and alkali-soluble silica contents — Molybdosilicate spectrometric method

1 Scope and field of application

This International Standard specifies a molybdosilicate spectrometric method for the determination of the total and alkali-soluble silica contents of crude sodium borates for industrial use.

The method is applicable to products having total silica contents in the range 0,4 to 4,0 % (*m/m*), and alkali-soluble silica contents in the range 0,01 to 0,05 % (*m/m*).

2 Principle

Preparation of test solutions by

- fusion of a test portion with sodium carbonate for the determination of the total silica content, and
- dissolution of the alkali-soluble part of a test portion in sodium hydroxide solution for the determination of the alkali-soluble silica content.

Formation of the molybdosilicate, followed by spectrometric measurement, at a wavelength of about 400 nm.

3 Reagents and materials

During the analysis, use only reagents of recognized analytical grade and only double-distilled water stored in a polyethylene bottle.

3.1 Sodium carbonate, anhydrous.

3.2 Sulfuric acid, approximately 36,5 % (*m/m*) solution prepared by diluting sulfuric acid, approximately 96 % (*m/m*) solution, 1 → 4.

Store in a polyethylene bottle.

3.3 Ammonium molybdate tetrahydrate [Hexa-ammonium heptamolybdate tetrahydrate] $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}]$, 80 g/l solution.

Store in a polyethylene bottle. Discard the solution if it becomes cloudy.

3.4 Ammonia, approximately 87,5 g/l solution.

Store in a polyethylene bottle.

3.5 Sodium hydroxide, approximately 80 g/l solution.

Store in a polyethylene bottle.

3.6 Mannitol, approximately 100 g/l solution.

Store in a polyethylene bottle.

3.7 Silica, standard solution corresponding to 0,200 g of silica (SiO_2) per litre.

Fuse 0,200 g of pure silica with 2 g of the sodium carbonate (3.1) in a platinum crucible until a clear melt is obtained. Cool, dissolve the melt in water, transfer quantitatively to a 1 000 ml one-mark volumetric flask, dilute to the mark and mix.

Transfer the solution immediately to a polyethylene bottle. Discard after 1 month.

1 ml of this standard solution contains 0,200 mg of SiO_2 .

3.8 Phenolphthalein, 1 g/l solution in 95 % (*V/V*) ethanol.

3.9 pH indicator paper (universal).

4 Apparatus

Apparatus which comes into contact with the test solution shall be free from silica (for example of polyethylene) to avoid any contamination. The volumetric flasks may, however, be of glass, provided that they are not scratched or matt.

4.1 Spectrometer with selectors for continuous wavelength variation, fitted with cells having optical path lengths of 4 cm or 5 cm for the alkali-soluble silica content and 1 cm for the total silica content, or

4.2 Spectrometer with selectors for discontinuous wavelength variation, fitted with similar cells.

4.3 pH meter, with glass measurement electrode and calomel reference electrode.