

British Standard Methods of test for

Aluminium oxide

Part 13. Preparation of sample solution by treatment with hydrochloric acid under pressure

[ISO title : Aluminium oxide primarily used for the production of aluminium — Preparation of solution for analysis — Method by hydrochloric acid attack under pressure]

Méthodes d'essai de l'oxyde d'aluminium

Partie 13. Mise en solution de l'échantillon pour analyse par attaque à l'acide chlorhydrique sous pression

Verfahren zur Prüfung von Aluminiumoxid

Teil 13. Vorbereitung der Probelösung durch Aufschluß mit Salzsäure unter Druck

NOTE. It is recommended that this Part be read in conjunction with the general information given in BS 4140 : Part 0 'General introduction' which is issued separately.

National foreword

This Part of BS 4140 is identical with ISO 2073-1976 'Aluminium oxide primarily used for the production of aluminium — Preparation of solution for analysis — Method by hydrochloric acid attack under pressure' published by the International Organization for Standardization (ISO).

This method supersedes clause 13 of Addendum No. 2 (1974) to BS 4140 : 1967. Parts 11 to 16* of this standard collectively supersede Addendum No. 2 (1974) to BS 4140 : 1967, which is withdrawn.

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 drawn especially to the following.

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

In British Standards it is current practice to use the symbol 'L' for litre (and its submultiples) rather than 'l'.

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

Cross-references

International standard	Corresponding British Standard
ISO 802-1976	BS 4140 Methods of test for aluminium oxide Part 1 : 1986 Preparation and storage of test samples (Identical)
ISO 2927-1973	Part 20 : 1980 Sampling (Identical)

NOTE. The other international standards listed in the annex are for information only. Their correspondence with British Standards is summarized in BS 4140 : Part 0 'General introduction'.

This standard prescribes methods of test only, and should not be used or quoted as a specification defining limits of purity. Reference to this Part should indicate that the method of test used complies with BS 4140 : Part 13 : 1986.

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

*Parts 14 and 15 are in preparation.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the dissolution of aluminium oxide primarily used for the production of aluminium, by means of attack by hydrochloric acid under pressure in a sealed borosilicate glass tube, in order to obtain a test solution for certain determinations.

The method is not applicable to the preparation of test solutions for the determination of silicon, sodium or boron, owing to the possibility of extraction of these elements from the glass.

NOTE – Hydrochloric acid may be replaced by another appropriate acid. In this case, the acid should be stated in the method of test of the impurity.

2 REFERENCES

ISO 802, *Aluminium oxide primarily used for the production of aluminium – Preparation and storage of test samples.*

ISO 2927, *Aluminium oxide primarily used for the production of aluminium – Sampling.*

3 PRINCIPLE

Attack of a test portion by hydrochloric acid under pressure in a sealed borosilicate glass tube heated in an electric oven controlled at 250 or 275 °C.

4 REAGENT

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

4.1 Hydrochloric acid, ρ approximately 1,19 g/ml, about 38 % (m/m) solution.

5 APPARATUS

Ordinary laboratory apparatus and

5.1 Borosilicate glass tubing, having thick walls (of thickness about 2,4 mm) and an external diameter of about 16 mm.

5.2 Borosilicate glass rod, of diameter about 4 mm.

5.3 Glass-blowing equipment, comprising :

5.3.1 Gas burner, fed by a mixture of combustible gas and oxygen, with suitable heads.

5.3.2 Normal combustible gas and oxygen.

5.3.3 Glass cutter.

5.3.4 Protective goggles, tinted.

5.3.5 Blower, with rubber tube connected to gas burner.

5.4 Pencil, resistant to high temperatures, for marking glass.

5.5 Tube holder, to keep tubes vertical, or alternatively

5.5.1 Tube holder, to keep tubes at an inclination of about 30°.

5.6 Funnel, of diameter approximately 40 mm, with short stem.

5.7 Electric oven, capable of being controlled at 250 ± 5 °C and 275 ± 5 °C.

5.8 Protecting steel tubes, of internal diameter about 25 mm and length about 260 or 310 mm, according to the length of the glass tube (5.1) used, threaded and firmly fitted with screw caps at each end. A number of holes of diameter about 6 to 8 mm shall be made at random intervals along the length of the protective tube. This tube is necessary in order to avoid damage to the interior of the oven and to adjacent tubes in case a reaction tube should burst. The holes are necessary to allow the escape of gases in the event of breakage of a reaction tube and to avoid a rise of pressure inside the protective tube.

6 PROCEDURE

6.1 Test portion

According to the determination to be carried out, weigh, to the nearest 0,001 g, 1 or 2 g of the test sample, dried at 300 °C (see 3.3 of ISO 802).