
International Standard



6994

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Aluminium ores — Determination of aluminium content — EDTA titrimetric method

Minerais alumineux — Dosage de l'aluminium — Méthode titrimétrique à l'EDTA

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6994 was prepared by Technical Committee ISO/TC 129, *Aluminium ores*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Aluminium ores — Determination of aluminium content — EDTA titrimetric method

1 Scope and field of application

This International Standard specifies an EDTA titrimetric method for the determination of the aluminium content of aluminium ores.

The method is applicable to products having aluminium contents, expressed as aluminium oxide (Al_2O_3), in the range 30 to 65 % (*m/m*).

2 Reference

ISO 8557, *Aluminium ores — Determination of hygroscopic moisture in analytical samples — Gravimetric method.*

3 Principle

Decomposition of the test portion by either

- a) treatment with hydrochloric, nitric and sulfuric acids;

NOTE — This method is recommended for ores containing gibbsite and/or boehmite and when the residue from the dissolution of the test portion after silica volatilization is less than 1 % of the mass of the test portion.

or

- b) sintering with sodium peroxide followed by brief fusion and dissolution of the melt with sulfuric acid;

NOTE — This method is recommended for ores containing diaspore and when the residue from the dissolution of the test portion after silica volatilization is greater than 1 % of the test portion.

or

- c) fusion with sodium tetraborate/sodium carbonate flux followed by dissolution of the melt with sulfuric acid.

NOTE — This method is suitable for all types of ore.

Removal of silica by filtration to give a solution containing aluminium and other elements. Measurement of an aliquot portion and precipitation of aluminium and other elements except chromium, manganese and vanadium, by ammonium benzoate in acid solution. Filtration and dissolution of the precipitated benzoates in acid followed by precipitation of elements except aluminium by sodium hydroxide. Filtration of the precipitate followed by acid dissolution, reprecipitation with sodium hydroxide and filtration to recover coprecipitated aluminium. Addition of an excess of EDTA to the combined filtrates and determination of aluminium content by back titration of the excess EDTA with zinc sulfate solution using xylenol orange as indicator.

4 Reagents

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

4.1 Sodium peroxide (Na_2O_2), powdered.

NOTE — Sodium peroxide should be protected against humidity and should not be used once it has begun to agglomerate.

4.2 Sodium carbonate/sodium tetraborate flux.

Mix intimately 3 parts by mass of anhydrous sodium carbonate (Na_2CO_3) and 1 part by mass of anhydrous sodium tetraborate ($\text{Na}_2\text{B}_4\text{O}_7$).

4.3 Ammonium acetate, 250 g/l solution.

Dissolve 250 g of ammonium acetate in 900 ml of water and adjust the pH to 6 by the addition of glacial acetic acid (ρ 1,050 g/ml). Dilute to 1 litre.

4.4 Ammonium benzoate, 100 g/l solution.

NOTE — To obtain a clear solution after warming, it may be necessary to add up to 5 ml of ammonia solution (4.6). Filter if necessary to remove any particulate residue.