
International Standard



8556

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

Aluminium ores — Determination of phosphorus content — Molybdenum blue spectrophotometric method

Minerais alumineux — Dosage du phosphore — Méthode spectrophotométrique au bleu de molybdène

First edition — 1986-04-15

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 8556 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 phosphorus content — Molybdenum blue spectrophotometric method

1 Scope and field of application

This International Standard specifies a molybdenum blue spectrophotometric method for the determination of phosphorus in aluminium ores and minerals.

The method is applicable to materials having phosphorus contents, expressed as diphosphorus pentoxide between 0,01 and 5 % (m/m).

The arsenic content of the sample does not affect the determination.

2 Reference

ISO 8558, *Aluminium ores — Preparation of predried test samples*.

3 Principle

Decomposition of a test portion, by either

- a) treatment with a mixture of hydrochloric acid, nitric acid and sulfuric acid;

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 test portion.

or

- b) sintering with sodium peroxide followed by a brief fusion. 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 is greater than 1 % of the mass of the test portion.

Dehydration of silica, dissolution of salts, filtration and ignition of the impure silica. Removal of the silica by evaporation with hydrofluoric and sulfuric acids. Fusion with sodium carbonate and sodium tetraborate, dissolution with hydrochloric acid and combination with the main solution.

Addition of molybdate to convert the phosphate to molybdophosphate complex, and reduction to molybdenum blue with ascorbic acid. Spectrophotometric measurement of the absorbance of the molybdenum blue complex at approximately 710 nm.

4 Reagents

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

4.1 Sodium peroxide (Na_2O_2), powder.

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) with 1 part by mass of anhydrous sodium tetraborate ($\text{Na}_2\text{B}_4\text{O}_7$).

4.3 Sulfuric acid, ρ_{20} 1,84 g/ml, diluted 1 + 1.

4.4 Sulfuric acid, ρ_{20} 1,84 g/ml, diluted 1 + 9.

4.5 Hydrofluoric acid, 40 % (m/m) (ρ_{20} 1,13 g/ml) or 48 % (m/m) (ρ_{20} 1,18 g/ml).

4.6 Hydrobromic acid, 40 % (m/m) (ρ_{20} 1,38 g/ml) or 47 % (m/m) (ρ_{20} 1,48 g/ml).

4.7 Acid mixture

Measure into a 1 litre beaker 225 ml water and add cautiously, with mixing, 175 ml of sulfuric acid (4.3). Cool well and add 150 ml hydrochloric acid (ρ_{20} 1,19 g/ml) and 50 ml of nitric acid (ρ_{20} 1,41 g/ml).

Prepare this solution fresh for each series of tests, and discard any unused solution, flushing copiously with water.

4.8 Ascorbic acid ($\text{C}_6\text{H}_8\text{O}_6$), 2 g/l solution.

Prepare this solution fresh on the day of use.

4.9 Disodium disulfite ($\text{Na}_2\text{S}_2\text{O}_5$), 150 g/l solution.

Prepare this solution fresh on the day of use.

4.10 Sodium molybdate ($\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$), 50 g/l solution.