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Aluminium oxide primarily used for the production of aluminium — Determination of alpha alumina content — Method using X-ray diffraction net peak areas

Oxyde d'aluminium principalement utilisé pour la production d'aluminium — Dosage de la teneur en alumine alpha — Méthode utilisant la diffraction à rayons X des surfaces de pic net

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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The committee responsible for this document is ISO/TC 226, *Materials for the production primary aluminium*.

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Introduction

This International Standard is based on an Australian Standard AS 2879.3-2010, *Alumina — Determination of alpha alumina content by X-ray diffraction*.

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Aluminium oxide primarily used for the production of aluminium — Determination of alpha alumina content — Method using X-ray diffraction net peak areas

1 Scope

This International Standard sets out an X-ray diffraction method for the determination of the alpha alumina content of smelter grade alumina. The method is applicable to smelter grade alumina containing alpha phase at levels up to 50 %. The percentage by mass of alpha alumina is determined on an "as received" basis.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AS 4538.2, *Guide to the sampling of alumina — Preparation of samples*

3 Principle

The integrated peak areas of the (012) and (116) lattice plane reflections (nominal *d* spacings 0,348 nm and 0,160 nm) are measured for the test sample and a 100 % alpha alumina calibration standard. The ratio between the net peak area intensities for the test sample and for the standard is determined and the alpha alumina content calculated from this ratio.

4 Reagents

4.1 General

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

4.2 100 % alpha alumina calibration standard, prepared in accordance with either 4.2.1 or 4.2.2.

4.2.1 A commercially available, certified 100 % alpha alumina calibration standard suitable for diffraction analysis.

4.2.2 An in-house produced 100 % alumina calibration standard prepared in accordance with 6.1 and using the following reagents.

4.2.2.1 Hydrochloric acid (100 g/l).

4.2.2.2 Smelter grade alumina.

NOTE The type of alumina used as the base for the 100 % alpha alumina calibration standard can affect the peak areas measured. Grades of the base alumina other than smelter grade can yield different peak area intensities.

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