AS 2879.3—2010

Australian Standard®

Alumina

Part 3: Determination of alpha alumina content by X-ray diffraction

This Australian Standard® was prepared by Committee MN-009, Alumina and Materials used in Aluminium Production. It was approved on behalf of the Council of Standards Australia on 28 July 2010.
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The following are represented on Committee MN-009:

- Australasian Institute of Mining and Metallurgy
- Australian Aluminium Council
- Mineral Council of Australia
- The Royal Australian Chemical Institute

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PREFACE

This Standard was prepared by the Standards Australia Committee MN-009, Alumina and Materials used in Aluminium Production, to supersede AS 2879.3—1991, *Alumina*, Part 3: *Determination of alpha alumina content by X-ray diffraction*.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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1 SCOPE

This 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 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
2850 Chemical analysis—Inter-laboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct

4538 Guide to the sampling of alumina
4538.2 Part 2: Preparation of samples

H.P. Klug and L.E. Alexander. *X-ray diffraction procedures for polycrystalline and amorphous materials*. 2nd ed. Wiley, New York. 1974.

V.E. Burke, R. Jenkins and D.K. Smith. *A practical guide for preparation of specimens for X-ray fluorescence and X-ray diffraction analysis*. John Wiley and Sons, New York. 1998.

3 PRINCIPLE

The integrated peak areas of the (012) and (116) lattice plane reflections (nominal *d* spacing 0.348 to 0.160 nm) are measured for the test sample and a 100% alpha alumina 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 Hydrochloric acid (10% m/V)

Not necessary if a commercial 100% calibration standard (4.4) is to be used.

4.3 Smelter grade alumina

Not necessary if a commercial 100% calibration standard (4.4) is to be used.