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CHEMICAL ANALYSIS OF REFACTORIES AND REFRACTORY MATERIALS

Part 2—ALUMINOSILICATE REFRACTORY MATERIALS

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The following interests are represented on Committee MN/7:

Australasian Institute of Mining and Metallurgy

Bureau of Steel Manufacturers of Australia

Cement and Concrete Association of Australia

Commonwealth Scientific and Industrial Research Organization

Electricity Supply Association of Australia

Institute of Australian Foundrymen (N.S.W. Division)

Institute of British Foundrymen (Australian Branch)

Refractories Manufacturers' Association of Australia

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PREFACE

This standard was prepared by the Association's Committee on Refractories as the second part of a standard being prepared to supersede AS R28—1965. It deals with the chemical analysis of aluminosilicate refractory materials. Separate parts of this standard deal with the analysis of the other refractory materials in the series, as follows:

Part 1 Silica Refractory Materials

Part 3 High Alumina Refractory Materials*

Part 4 Magnesite and Dolomite Refractory Materials*

Part 5 Chrome-bearing Refractory Materials*

Since this standard was circulated in draft form for comment in 1978, a revision of format has been undertaken to bring the details into complete compliance with the requirements of SAA MP34, Guide to the Layout and Preparation of Standard Methods of Chemical Analysis, as well as to incorporate other modifications.

Changes in the standard were motivated by a requirement for the updating of analytical methodology, instrumental techniques having replaced many of the former classical analysis methods.

The committee acknowledges the documented work of ISO/TC 33, Refractories, and the reference standard BS 1902, Methods of Testing Refractory Materials, which were used as source materials in the development of this standard. For selection of the gross sample, reference is made to AS 2497, Sampling Procedures for Acceptance Testing of Shaped Refractory Products, which was developed by another subcommittee of the Committee on Refractories.

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*In course of preparation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

CHEMICAL ANALYSIS OF REFRACTORIES AND REFRACTORY MATERIALS

PART 2—ALUMINOSILICATE REFRACTORY MATERIALS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard sets out methods for the sampling, preparation of sample and analysis of aluminosilicate refractories and refractory materials. Procedures are described for determining—

(a) the loss on ignition; and

(b) the chemical composition, viz the amount of silicon, phosphorus, aluminium, iron, titanium, manganese, calcium, magnesium, sodium, potassium and lithium present, expressed as the oxides of these elements.

Table 1.1 illustrates the typical composition of aluminosilicate refractories and the associated form of expression.

TABLE 1.1
COMPOSITION OF ALUMINOSILICATE REFRACTORY MATERIALS

Constituent	Expressed as	Range, percent
Silicon dioxide	SiO_2	40 to 93
Aluminium oxide	Al_2O_3	5 to 46
Calcium oxide	CaO	0 to 5
Iron(III) oxide	Fe_2O_3	0 to 5
Potassium oxide	K_2O	0 to 5
Titanium(IV) dioxide	TiO_2	0 to 2
Magnesium oxide	MgO	0 to 1
Phosphorus pentoxide	P_2O_5	0 to 1
Manganese(II) oxide	MnO	0 to 0.5
Sodium oxide	Na_2O	0 to 0.5
Lithium oxide	Li_2O	0 to 0.5

1.2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1152 Test Sieves*
AS 2243 Safety in Laboratories
Part 2—Chemical
AS 2497 Sampling Procedures for Acceptance Testing of Shaped Refractory Products
AS CK19 Code of Recommended Practice for the Chemical Analysis of Materials by Ultraviolet Visible Spectrophotometry

1.3 DEFINITION. For the purpose of this standard, the following definition applies:

Aluminosilicate refractory—a refractory or refractory material in which the aluminium oxide content is not more than 46 percent (m/m).

1.4 REPEATABILITY. Duplicate determinations shall be carried out in all cases. The analyses shall be repeated if the difference between duplicate determinations exceeds the following limits:

(a) For aluminium oxide or other constituent in the sample exceeding 30 percent (m/m) ..... 0.3 percent max.

(b) For silicon dioxide or other constituent amounting to between 10 percent and 30 percent (m/m) ..... 0.2 percent max.

(c) For constituents amounting to between 5 percent and 10 percent (m/m) ..... 0.1 percent max.

(d) For constituents amounting to less than 5 percent (m/m) ..... 0.05 percent max.

*In course of revision.