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Fine ceramics (advanced ceramics, advanced technical ceramics) — Methods for chemical analysis of boron nitride powders

Céramiques techniques — Méthodes pour l'analyse chimique de poudres de nitrure de bore

Reference number
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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 206, *Fine ceramics*.

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Introduction

This International Standard describes the chemical analysis of boron nitride powders for use in fine ceramics applications. Determination methods of both main and trace constituents of interest are fully covered.

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Fine ceramics (advanced ceramics, advanced technical ceramics) — Methods for chemical analysis of boron nitride powders

1 Scope

This International Standard specifies the methods for the chemical analysis of fine boron nitride powders used as the raw material for fine ceramics.

This International Standard stipulates the analysis methods of total boron, free boron, total nitrogen, aluminium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, silicon, sodium, titanium, vanadium, zinc, carbon, and oxygen in boron nitride powders for fine ceramics. Total boron is determined by using either a fusion–titration method or a fusion–inductively coupled plasma-optical emission spectrometry (ICP-OES). Free boron is determined by using either an acid digestion–ICP-OES or a methanol extraction–ICP-OES. If necessary, the boron amount which arises from the hydrolysis of boron nitride during sample treatment is corrected using spectrophotometry. Total nitrogen is determined by using either an acid pressure decomposition–distillation separation–titration method or an inert gas fusion–thermal conductivity method. Silicon is determined by using a fusion–ICP-OES. Aluminium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, titanium, vanadium, zinc are determined by using an acid pressure decomposition–ICP-OES or a fusion–ICP-OES. Sodium and potassium are determined by using atomic absorption spectrometry (AAS), flame emission spectrometry (FES), or ICP-OES following acid pressure decomposition. Carbon is determined by using a combustion–IR absorption spectrometry or a combustion–thermal conductivity method. Oxygen is determined by using an inert gas fusion–IR absorption spectrometry.

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.

EN 12698-1:2007, *Chemical analysis of nitride bonded silicon carbide refractories - Part 1: Chemical methods*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 6353-3, *Reagents for chemical analysis — Part 3: Specifications — Second series*

ISO 9138, *Abrasive grains — Sampling and splitting*

ISO 21068-2:2008, *Chemical analysis of silicon-carbide-containing raw materials and refractory products — Part 2: Determination of loss on ignition, total carbon, free carbon and silicon carbide, total and free silica and total and free silicon*

3 General rules in chemical analysis

Chemical analysis shall be performed in accordance with general rules regulated as standards, if available.

4 Analysis items

Analysis items specified in this International Standard shall be as follows:

a) Total boron (T.B)

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