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Testing of ceramic materials — Determination of sulfur in non-oxidic ceramic raw materials and ceramic materials —

Part 1: Infrared measurement methods

Analyse des matériaux céramiques — Dosage du soufre dans les produits et les matières premières céramiques non oxydes —

Partie 1: Méthodes d'essai par infrarouge

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Foreword

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This document was prepared by Technical Committee ISO/TC *33, Refractories*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 187, *Refractory products and materials,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14720-1:2013), which has been technically revised.

The main changes are as follows:

— title of this document has been revised to better describe its field of application;

— Clause 1 adapted to the new title;

— Clauses 2 and 3 added, noting that neither add any normative references or terms and definitions to the document;

— ultraviolet absorption cell was added to Clause 4 and 5.1;

— resistance furnace removed from 5.1;

— storage of pre-cleaned crucibles in a desiccator added to 9.1;

— subclause 9.3 adds more detail about the use of combustion accelerators.

A list of all parts in the ISO 14720 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Testing of ceramic materials — Determination of sulfur in non-oxidic ceramic raw materials and ceramic materials —

Part 1: Infrared measurement methods

1 Scope

This document specifies a method for the determination of sulfur in non-oxidic ceramic raw materials and ceramic materials, such as silicon carbides, silicon nitrides, graphites, carbon blacks, cokes, carbon powders. If demonstrated by the recovery rate, this document can also be applied for other non-metallic powdered and granular materials, e.g. silicon dioxide.

This document is applicable for materials with mass fractions of sulfur from 0,005 % to 2 %.

This document can also be applied for materials with higher mass fractions of sulfur after verification of the particular case.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

The sample and added combustion accelerators (mostly tungsten-, tin- or iron-granules) are heated in an inductive furnace under oxygen atmosphere. The high-frequency field of the furnace couples with electrically conductive components of sample and combustion accelerators. The sample is heated to temperatures above 1 800 °C and the total sulfur content of the sample is released as sulfur dioxide. The reaction gas is transferred to the infrared or ultraviolet absorption cell of the analyser. The molecular absorption of sulfur dioxide is measured by using a narrow-band optical filter which is translucent for the wavelength of the characteristic infrared or ultraviolet absorption of sulfur dioxide. The mass fraction of sulfur dioxide in the reaction gas is proportional to peak-height and peak-area, respectively, of the transient absorption signal. The mass fraction of sulfur in the sample is calculated by using a calibration function established by suitable calibration samples measured under comparable conditions.

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