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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3045-2024

Replacing GB/T 3045-2017

Conventional abrasive - Chemical analysis of silicon carbide

普通磨料 碳化硅化学分析方法

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 3045-2017 "Chemical analysis methods for common abrasive silicon carbide". Compared with GB/T 3045-2017, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The sample preparation method has been changed (see Chapter 4, 3.1 and 4.2 of the 2017 edition);
- b) The test steps and data processing for the combustion absorption gravimetric method for determining surface carbon (free carbon) have been modified (see 5.1.2.4 and 5.1.2.5, 3.4.1.4 and 3.4.1.5 of the 2017 edition);
- c) The test procedure for the determination of silicon dioxide by spectrophotometry has been changed (see 5.2.2.4, 3.2.1.4 of the 2017 edition);
- d) The test procedure for the determination of surface silicon (free silicon) by spectrophotometry has been changed (see 5.3.3.4, 3.3.1.4 of the 2017 edition);
- e) Added the allowable error for the determination of loss on acid treatment (LAT) (see 5.4.6);
- f) The EDTA volumetric method for determining calcium oxide and magnesium oxide has been deleted (see 3.9.1 of the 2017 edition);
- g) Modified the data processing for the determination of iron, aluminum, calcium and magnesium by inductively coupled plasma emission spectrometry (see 5.8.5, 2017 edition) 3.10.5);
- h) Added the applicable scope of the indirect method for determining silicon carbide content (see 7.2.2);
- i) The method for determining iron, aluminum, calcium and magnesium by radiographic fluorescence spectrometry (RFA) has been deleted (see Chapter 5 of the 2017 edition).

This document is modified to adopt ISO 9286:2021 "Chemical analysis of abrasives and crystalline bulk silicon carbide".

Compared with ISO 9286:2021, this document has many structural adjustments.

Comparison table of structural number changes between the two documents See Appendix A.

This document has many technical differences compared to ISO 9286:2021.

A list of these technical differences and their causes is given in Appendix B.

The following editorial changes were made to this document.

--- To coordinate with the existing standards, the name of the standard is changed to "Chemical Analysis Methods of Common Abrasive Silicon Carbide".

1 Scope

This document describes the analytical methods for the main chemical components in silicon carbide.

This document is applicable to abrasives and crystal blocks with a silicon carbide content of not less than 95% (mass fraction) surface carbon (free carbon), silicon dioxide, Analysis activities for chemical composition such as surface silicon (free silicon), acid treatment loss, iron, aluminum, calcium, magnesium, total carbon and silicon carbide.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 4676 Sampling method for common abrasives (GB/T 4676-2018, ISO 9138:2015, MOD) GB/T 6682 Specifications and test methods for water used in analytical laboratories (GB/T 6682-2008, ISO 3696:1987, MOD)

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4.1 Abrasive

According to GB/T 4676, sample and reduce to 50g~60g, dry in an oven at 105°C~110°C for 1h, take out, and put in a dryer Cool in a container and set aside.

For the determination of total carbon and surface carbon (free carbon), the abrasive with a particle size of F120 or coarser or P150 or coarser should be crushed before drying.

Crumble, grind until all the particles pass through a sieve with a basic mesh size of 150 μm and mix well. If a steel mortar is used, iron will be introduced during the grinding process.

If the amount is less than 0.1% (mass fraction), it can be ignored; if it is greater than 0.1% (mass fraction), the iron content of the sample should be determined at the same time (according to 5.8) and include it in the corresponding result. When determining the iron content, it is best to use a hard metal, boron carbide or corundum mortar.

If iron is introduced into the sample, the mass of the analyzed sample should be corrected according to formula (1).

$$m_0 = m_1[1 - w(\text{Fe})] \quad (1)$$

Where.

m_0 --- sample calibration mass, in grams (g);

m_1 --- the mass of the sample containing iron, in grams (g);

$w(\text{Fe})$ ---The mass fraction of iron introduced into the sample due to grinding.

4.2 Crystallization block

Crystalline bulk samples should be prepared by the following steps.

- a) Pre-dry several samples of about 20 kg in an oven at 105°C~110°C.
- b) Crush the sample in a laboratory jaw crusher to a particle size of less than 2.36 mm. Sieve the sample through a 2.36 mm sieve and crush