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OF CHINA**

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GB/T 16555-2008

Replace GB/T 16555.1~16555.6-1996, GB/T 13245~13246-1991

**Chemical analysis of refractories containing
carbon and silicon carbide or nitride**

含碳、碳化硅、氮化物耐火材料化学分析方法

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Contents

Foreword.....	1
1 Scope	3
2 Normative references	4
3 Terms and definitions.....	5
4 Instruments and equipment.....	6
5 Sample preparation.....	7
6 General rules	8
7 Test report	9
8 Provisions of loss on heat treatment	11
9 The determination of loss on ignition and volatile components	12
10 The determination of total carbon content.....	14
11 The determination of free carbon	22
12 The determination of silicon carbide content	26
13 The determination of total nitrogen (T.N)	33
14 Measurement of silicon nitride content.....	39
15 Measurement of free silicon content.....	40
16 Measurement of free aluminum content.....	47
17 Measurement of iron oxide, aluminum oxide -- EDTA volumetric method (continuous titration of iron and aluminum).....	54
18 Oxide measurement (silicon oxide, aluminum oxide, iron oxide, titanium oxide, calcium oxide, magnesium oxide, potassium oxide, zirconium oxide, chromium sesquioxide, manganese oxide and phosphorus pentoxide).....	62
Annex A (Normative) Program of acceptance analysis value	65

Foreword

This standard has replaced GB/T16555.1-16555.6-1996 *Chemical analysis for silicon carbide refractories*, GB/T 13245-1991 *Chemical analysis method of refractories containing carbon—Determination of the total carbon—Combustion gravimetric method* and GB/T 13246-1991 *Chemical analysis method of refractories containing carbon—Determination of magnesium oxide content—CyDTA volumetric method* and the major technical changes in this part are the following compared with them.

- Consolidated standards and prepared them by chapters, adjusted the structure and format of the standard and changed the name of the standard at the same time.
- Added terms and definitions;
- Newly developed that determining the total carbon content by using combustion-infrared method;
- Newly developed that determining the total nitrogen content by using thermal conductimetric method after fusion in a current of inert gas.
- Newly developed that determining the free aluminum content by using edta volumetric method of iron salt replacement.
- Newly developed that determining the iron oxide by using edta volumetric method.
- Newly developed that determining the free aluminum content by using the gasometric method.
- Newly developed that determining the free carbon content by using indirect method.
- Newly added the method of determining the loss on ignition.
- Newly added the direct method of determining the silicon carbide content.
- Newly added the hydrofluoric acid evaporation and gravimetric method to determine the silicon carbide content.
- Newly added the determine method for heat treatment reduction;
- Modified the measuring temperature of free carbon;
- Extended the determine range of analysis method;
- Modified the allowable error of analysis method;

The annex A in this standard is normative annex.

This standard is proposed by and under the jurisdiction of the China Standardization Committee on refractory materials (SAC/TC 193).

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Previous versions that this standard replaces are as follows:

-GB/T 16555.1—16555.6-1996;

-GB/T13245-1991;

-GB/T13246-1991.

Chemical analysis of refractories containing carbon and silicon carbide or nitride

1 Scope

This standard specifies the chemical analysis of refractories and raw materials containing carbon and silicon carbide or nitride. The items analyzed by this standard are as follows:

- a) Volatile (VOL);
- b) Loss on ignition (LOI);
- c) Total Carbon (T.C);
- d) Free carbon content (F.C);
- e) Silicon carbide content - (SiC);
- f) Total nitrogen (T.N);
- g) Silicon nitride content (Si_3N_4);
- h) Free silicon content (F.Si);
- i) Free aluminum content (F.Al);
- j) Silicon dioxide content (SiO_2);
- k) Alumina content (Al_2O_3);
- l) Iron oxide content (Iron with all valences shall be counted by Fe_2O_3)
- m) Titanium dioxide content (TiO_2)
- n) Calcium oxide content (CaO);
- o) Magnesium oxide content (MgO);
- p) Potassium oxide content (K_2O);
- q) Sodium oxide content (Na_2O);
- r) phosphorus pentoxide content (P_2O_5);
- s) Zirconium (Hafnium) content ($2\text{rO}_2+\text{HfO}_2$);
- t) Manganese oxide content (Manganese with all valence shall be counted by MnO)
- u) Chromium oxide content (Cr_2O_3).

The determining range of items analyzed in this standard is shown in table 1.

Table 1 Determining range

Analyzed items	Range /%	Analyzed items	Range /%
LOI/VOL	≤99	F. Si	0.1-20
T.C	0.01-99	F. Al	0.1-20
F.C	0.1-99	SiO ₂	≥0.1
SiC	1-99	Al ₂ O ₃	≥0.1
T. N	≤40	Fe ₂ O ₃	≤30
Si ₃ N ₄	0.1-99	TiO ₂	≤5
CaO	0.1-60	MgO	≤95
K ₂ O	0.1-5	Cr ₂ O ₃	≤40
Na ₂ O	0.1-5	2rO ₂ +HfO ₂	≤80
P ₂ O ₅	0.1-5	MnO	≤0.5

2 Normative references

The articles contained in the following documents have become this standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this standard. For the undated documents so quoted, the latest editions shall be applicable to this standard.

GB/T 223.69 Iron steel and alloy - Determination of carbon contents - Gas-volumetric method after combustion in the pipe furnace

GB/T 4984 Chemical analysis of refractories containing zirconia

GB/T 5069 Chemical analysis of magnesia-alumina refractories

GB/T 5070 Chemical analysis of refractories containing chrome

GB/T 6900 Chemical analysis of alumina-silica refractories

GB/T 6901 Chemical analysis of silica refractories

GB/T 7728-1987 Chemical analysis of metallurgical products-General rule for flame atomic absorption spectrometric methods

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