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

GB/T 1427-2016

Replacing GB/T 1427-2000

Sample method of carbon material

炭素材料取样方法

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Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB/T 1427-2000 "Sample method of carbon material". Compared with GB/T

1427-2000, the main technical content changes of this Standard are as follows: - ADD the normative references (see Clause 2); - MODIFY the sampling requirements for graphite electrodes and joints (see 3.2, 3.3, 3.4); - MODIFY the sampling requirements for graphite blocks (see 5.2); - MODIFY the sampling requirements for cathode carbon blocks for aluminum electrolysis cells (see 6.1, 6.2, 6.3, 6.4); - MODIFY the sampling requirements for electric furnace carbon blocks, self-baking carbon blocks and blast furnace carbon blocks (see 8.1, 8.3, 8.4); - MODIFY the sampling batch requirements for carbon resistance rods (see 9.1); - MODIFY the type and the sampling batch requirements for charcoal paste (see Clause 10); - ADD the sampling requirements for carbon cement and carbon mud (see Clause 11); - ADD the sampling requirements for isostatic graphite (see Clause 13); - ADD the sampling requirements for carbon substrates for solar power generation (see Clause 14); - ADD the sampling requirements for fine-particle high-density special graphite products (see Clause 15); - ADD the sampling requirements for mesophase carbon microspheres, soft carbon, hard carbon (see Clause 16); - ADD the sampling requirements for spherical graphite (see Clause 17); - ADD the sampling requirements for graphite anode materials, carbon composite lithium iron phosphate cathode materials, lithium titanate and carbon composite anode materials (see Clause 18); - ADD the sample storage requirements (see 19.3). This Standard was proposed by China Iron and Steel Industry Association. This Standard shall be under the jurisdiction of National Technical Committee on Steel of Standardization Administration of China (SAC/TC 183). Drafting organizations of this Standard. China Pingmei Shenma Group Kaifeng Carbon Co., Ltd., Shanghai Shanshan Technology Co., Ltd., Zhanjiang Juxin New Energy Co., Ltd., Ningxia Ningping Carbon Co., Ltd., China Metallurgical Information and Standardization Institute. Main drafters of this Standard. Liu Yunping, Zheng Jianhua, Qiao Yongmin, Du Huiyu, Wu Qixiu, Cao Peifeng, Zheng Jingxu, Feng Junjie, Lu Hongbing, Ding Xiaoyang, Zhang Yongbin. The previous released versions replaced by this Standard are as follows: - GB/T 1427-1988, GB/T 1427-2000. Sample method of carbon material

1 Scope

GB/T 1427-2016 is the Chinese national standard on sample method of carbon material, in the field of electrical engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 14 June 2016 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 May 2017. Classification: ICS 29.050, CCS Q50. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the sampling tool, sampling position, sampling quantity and specimen size and precision of carbon materials. This Standard is applicable to the taking and preparation of carbon material samples such as graphite electrodes, graphite anodes, graphite blocks, cathode carbon blocks, carbon electrodes, electric furnace carbon blocks, carbon paste, high-purity graphite products, mesophase carbon microspheres.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 13732 General rules for sampling inspection of bulk materials with uniform size

3 Graphite electrodes and joints (including general

power, impregnation, high power, ultra-high power), graphite electrode roasting products

3.1 Sampling batch If the output of graphitized products per furnace is greater than or equal to 30 t, the quantity of sampling electrodes is not less than 4 pieces. If it is less than 30 t, the quantity of sampling electrodes is not less than 3 pieces.

3.2 Sampling tool Hollow drill bits with an inner diameter of not less than 35 mm and a length of 250 mm, or other tools that guarantee the requirements of the specimen.

3.4 Specimen size and precision

3.4.1 Electrodes with a diameter of 550 mm and above are processed into not less than 4 specimens with a size of $\phi(30 \pm 0.1)$ mm x (180 ± 0.1) mm, which are used to measure the volume density, elastic modulus, resistivity and flexural strength.

4 Graphite anodes

4.1 Sampling batch The products to be loaded into the same graphitization furnace are regarded as one batch. The sampling quantity of each batch shall not be less than one thousandth of the quantity of loaded blocks, but each batch shall have not less than 10 specimens.

4.2 Sampling tool Hollow drill bits with an inner diameter of 60 mm and a length of 150 mm or other tools.

4.4 Specimen size and precision

4.4.1 Products of which the diameter or cross-section thickness of the anode is greater than or equal to 50 mm are processed into 4 ~ 6 specimens with a size of $\phi(40 \pm 0.1)$ mm x (40 ± 0.1) mm x (40 ± 0.1) mm or $\phi(45 \pm 0.1)$ mm x (40 ± 0.1) mm, of which the

pressurized surface is indicated, and the pressurization direction shall be parallel to the extrusion direction. In addition, it is processed into 4 ~ 6 specimens of $\phi(10 \pm 0.1)$ mm x (120 ± 0.1) mm for measuring the flexural strength.

5 Graphite blocks

5.1 Sampling batch If the output of each furnace is greater than or equal to 30 t, the sampling quantity is not less than 4 pieces. If it is less than 30 t, the sampling quantity is not less than 3 pieces.

5.2 Sampling tool Hollow drill bits with an inner diameter of not less than 65 mm and a length of not less than 150 mm or other tools.

5.4 Specimen size and precision The cylinders are processed into specimens of (40 ± 0.1) mm x (40 ± 0.1) mm x (40 ± 0.1) mm or $\phi(45 \pm 0.1)$ mm x (40 ± 0.1) mm.

5.5 Sample appearance The corners are intact and there are no visible cracks or flaws.

6 Cathode carbon blocks for aluminum electrolysis cells

6.1 Sampling batch Every 100 t is one batch. Those less than 100 t are regarded as 100 t. The sampling quantity per batch is not less than 3 pieces. 2 cylinders are drilled in each block.

6.2 Sampling tool Hollow drill bits with an inner diameter of not less than 65 mm and a length of not less than 150 mm or other tools.

6.4 Specimen size and precision The size and precision of the specimen shall be determined in accordance with the requirements of the tested item. However, the minimum size (usually the diameter) of the specimen is at least 3 times the maximum particle size of the dry aggregate.

6.5 Sample appearance The corners are intact and there are no visible cracks or flaws.

7 Carbon electrodes

7.1 Sampling batch Every 100 t is one batch. Those less than 100 t are regarded as 100 t. The sampling quantity per batch is not less than 3 blocks (pieces).

7.2 Sampling tool Hollow drill bits with an inner diameter of 65 mm and a length of not less than 150 mm or other tools.

7.4 Specimen size and precision The cylinders are processed into specimens of (40 ± 0.1) mm x (40 ± 0.1) mm x (40 ± 0.1) mm or $\phi(45 \pm 0.1)$ mm x (40 ± 0.1) mm.

7.5 Sample appearance The corners are intact and there are no visible cracks or flaws.

8 Electric furnace carbon blocks, self-baking carbon blocks, blast furnace carbon blocks