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

GB/T 4291-2017

Synthetic cryolite

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Table of Contents

- 1 Scope
- 2 Normative reference documents
- 3 Terms and definitions
- 4 Requirements
- 4.1 Grades and classifications

Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 4291-2007 "cryolite". This standard compared with GB/T 4291-2007, in addition to editorial changes, the main technical changes are as follows:

--- normative reference document GB/T 1250 modified to GB/T 8170 (see Chapter 2, 2007 edition of Chapter 2); - increase the number of bits reserved for the calculated results (see 4.1.1); - a series of product additions (see 4.2); (Fe₂O₃), sulfate (SO₄²⁻), calcium oxide (CaO), burn-down index of CH-0, CH-1 (Fe₂O₃), sulfate (SO₄²⁻), calcium oxide (CaO); CM-0, CM-1 in the sulfate (SO₄²⁻) (see 4.2); - the contents of Table 1, note 2, into the requirements (see 4.2, 2007 edition 4.3); - increased the requirements for cryolite color and agglomeration (see 4.3);

--- Remove the net weight of 40kg in 7.1 (see 2007 edition 7.1). This standard is proposed by China Nonferrous Metals Industry Association. This standard is owned by the National Committee for the Standardization of Nonferrous Metals (SAC/TC243). The drafting of this standard. Polyfluoride Chemical Co., Ltd., Hunan Nonferrous Fluorine Chemical Group Co., Ltd., Silver Zhongtian Chemical Co., Ltd. Any company, Yunnan Yun aluminum Chung Xin Aluminum Co., Ltd., the letter of the aluminum group. The drafters of this standard. Hou Hongjun, Yang Huachun, Xue Xujin, Shi Xihua, Ye Wenhao, Zhu Chonggao, Li Zhijian, Che Lizhi, Jia Shuqin, Dong Aiyun. This standard replaced the previous version of the standard release. GB/T 4291-1984, GB/T 4291-1999, GB/T 4291-2007. cryolite

1 Scope

China's national standard for synthetic cryolite. It specifies the requirements, the test methods, the inspection rules and the packaging. Cryolite is sodium aluminium fluoride, and it exists industrially for one purpose: it is the electrolyte in which alumina is dissolved to make aluminium. Alumina melts at over two thousand degrees, which would make electrolysis impossible; dissolved in molten cryolite it can be reduced at around 950 degrees, and that discovery is what made aluminium a common metal rather than a

precious one. Natural cryolite was mined in Greenland until the deposit was exhausted, so all of it is now synthetic. The bath loses fluoride continuously through volatilisation and reaction, so a smelter consumes cryolite and aluminium fluoride throughout its operation, and the purity matters because impurities entering the bath - phosphorus above all - reduce the current efficiency of the cell directly.

This standard specifies the requirements, test methods, inspection rules, packaging, marking, transportation, storage, and order (or contract) of cryolite content. This standard applies to hydrofluoric acid, fluorosilicic acid or sodium fluorosilicate and other synthetic method of the preparation of cryolite, which is mainly used for aluminum electrolysis production.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document. Representation and Judgment of Numerical Correction Rule and Limit Value of

GB/T 8170 YS/T 273 (all parts) method for chemical analysis of cryolite and determination of physical properties

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 The ratio of the amount of NaF to AlF_3 in the cryolite product.

4.1 Grades and classifications

4.1.1 cryolite according to its molecular score for two categories. Molecular ratio of 2.80 ~ 3.00 for the polymer than the cryolite, the molecular ratio of 1.00 ~ <

2.80 For ordinary cryolite. The molecular ratio can be calculated according to formula (1).

$$\text{Cryolite ratio} = \frac{w_{\text{Na}}}{w_{\text{Al}}} \times \frac{26.9815}{22.9897} \quad (1)$$
 Where. w_{Na} - mass fraction of sodium in cryolite products,%; w_{Al} - quality fraction of aluminum in cryolite products,%; 26.9815

--- relative atomic mass of aluminum; 22.9897

--- Relative atomic mass of sodium. The value is reserved for two digits after the decimal point.

4.1.2 cryolite according to the molecular score for the four grades. CH-0, CH-1, CM-0, CM-1. Grade with two English letters plus "-" plus 1-digit form. The letter C indicates the cryolite logo (C is the first letter of the name of the cryolite); the letters H and M Said the cryolite class, where H is the polymer than the cryolite, M is the ordinary cryolite, and the

number (0 or 1) is the sequence number.

4.2 Chemical composition and physical properties The chemical composition and physical properties of cryolite shall be in accordance with Table 1. There is a special requirement for chemical composition and physical properties

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