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

GB/T 18114.8-2025

Replacing GB/T 18114.8-2010

**Chemical analysis methods for rare earth concentrates - Part 8:
Determination of rare earth oxide contents and distribution**

稀土精矿化学分析方法 第8部分：稀土氧化物含量和配分量的测定

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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 is required. This document is Part 8 of GB/T 18114 Chemical Analysis Methods for Rare Earth Concentrates. GB/T 18114 has been published for the following part. -- Part

1. Gravimetric method for determination of total amount of rare earth oxides; -- Part

1 Scope

GB/T 18114.8-2025 is the Chinese national standard on chemical analysis methods for rare earth concentrates - part 8: determination of rare earth oxide contents and distribution, in the field of metallurgy. 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 1 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 February 2026. Classification: ICS 77.120.99, CCS H14. 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 document describes the method for the determination of rare earth oxide content and distribution in rare earth concentrates. This document is applicable to the determination of rare earth oxide content and distribution amount in rare earth concentrates. This document contains two methods. Inductively coupled plasma optical emission spectrometry (Method 1) is suitable for the distribution of rare earth oxides in rare earth concentrates. The

determination range is shown in Table 1. X-ray fluorescence spectrometry (method 2) is suitable for the determination of rare earth oxide content in rare earth concentrates. The fixed range is shown in Table 2. Table

1 Measurement range of inductively coupled plasma optical emission spectrometry (method 1) Oxide to be tested Lanthanum oxide, cerium oxide Praseodymium oxide, neodymium oxide Samarium oxide, europium oxide, gadolinium oxide, terbium oxide, dysprosium oxide, holmium oxide, Erbium oxide, thulium oxide, ytterbium oxide, lutetium oxide, yttrium oxide Determination range of rare earth oxide content 15.00~60.00 1.00~20.00 0.050~

10.00 Table 2 X-ray fluorescence spectrometry (method 2) measurement range Oxide to be tested Lanthanum oxide Cerium oxide Praseodymium oxide Neodymium oxide Samarium oxide, europium oxide, gadolinium oxide, yttrium oxide Terbium oxide, dysprosium oxide, holmium oxide, erbium oxide Measurement range (mass fraction) 3.00~30.00 5.00~40.00 1.00~5.00 1.00~15.00 0.050~3.00 0.10~0.50

2 Normative references

The contents of the following documents constitute the 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 6379.2 Accuracy (Trueness and Precision) of Measurement Methods and Results Part

3 Determination of calcium oxide content; -- Part

4. Determination of niobium oxide, zirconium oxide and titanium oxide content - Inductively coupled plasma optical emission spectrometry; -- Part

5. Determination of aluminum oxide content - Inductively coupled plasma optical emission spectrometry; -- Part

6 Determination of silicon dioxide content; -- Part

7. Determination of iron oxide content - Potassium dichromate titration method; -- Part

10 Determination of water content by gravimetric method; --Part

11. Determination of fluorine content. This document replaces GB/T 18114.8-2010 "Chemical analysis methods for rare earth concentrates Part

8.Fifteen rare earth element oxides" Determination of components by inductively coupled plasma optical emission spectrometry", compared with GB/T 18114.8-2010, except for structural adjustment and editorial changes, In addition to the dynamic, the main technical changes are as follows:

- a) The measurement range has been changed (see Chapter 1, Chapter 1 of the.2010 edition);
- b) Added the step of preparing the analytical solution by dissolving the sample in hydrochloric acid or perchloric acid for inductively coupled plasma optical emission spectrometry (Method 1). (See 4.5.4.2);
- c) Modified the preparation of the series of standard solutions in the inductively coupled plasma optical emission spectrometry (Method 1) (see 4.5.5,.2010 Edition). 6.4);
- d) Changed the precision in Inductively Coupled Plasma Optical Emission Spectrometry (Method 1) from "Permissible Difference" to "Reproducibility Limit" (See 4.7.2, 8.2 of the.2010 edition);
- e) X-ray fluorescence spectrometry (Method 2) has been added to determine the content of rare earth oxides (see Chapter 5). Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Rare Earth Standardization Technical Committee (SAC/TC 229). This document was drafted by: Baotou Rare Earth Research Institute, China Northern Rare Earth (Group) High-Tech Co., Ltd., Qiandong Rare Earth Group Co., Ltd. Co., Ltd., Hunan Rare Earth Metal Materials Research Institute Co., Ltd., Jiangxi Tungsten and Rare Earth Products Quality Supervision and Inspection Center (Jiangxi Tungsten and Rare Earth Research Institute), National Standard (Beijing) Inspection and Certification Co., Ltd., Xiamen Rare Earth Materials Research Institute, and Guohe General (Qingdao) Testing and Evaluation Co., Ltd. Company, Ganzhou Aikerui Testing Technology Co., Ltd. The main drafters of this document are. Wu Wenqi, Du Yejian, Nie Chenghong, Xue Jianping, Ren Xudong, Jiang Yujuan, Wen Bin, Chen Yan, Wang Guichao, Shi Xuefeng, Jiang Yuan, Zhang Chunlan, Chen Yanqun, Huang Xiaori, Xu Na, Liu Jiayu, Yu Lei, Zhang Qikai, Ren Sheng, Wang Xiangde, and Liu Xiaojian. This document was first published in.2000, revised for the first time in.2010, and this is the second revision.

Rare earth concentrate refers to the product of rare earth ore after beneficiation and enrichment, with rare earth content reaching the smelting requirements, and its rare earth elements are not naturally distributed. Including fluorocarbon cerium ore concentrate, monazite concentrate, fluorocarbon cerium ore-monazite mixed concentrate, fluorocarbon cerium lanthanum concentrate, etc. Rare earth has Excellent optical, electromagnetic and other physical properties, can be combined with other materials to form a variety of new raw materials with different properties, which can greatly improve other The quality and

performance of the product. Chemical composition is an important assessment indicator of rare earth concentrate products. It is necessary to develop a scientific and accurate chemical composition analysis method. Standards, by clarifying the scope of application, standardizing reagents and materials, test equipment and procedures, and giving precise results through repeated tests and verifications. The data collected can enhance the consistency and comparability of data between different laboratories, and provide a rigorous and standardized method for the quality inspection of rare earth concentrate products. GB/T 18114 "Chemical Analysis Methods for Rare Earth Concentrates" aims to establish A complete set of chemical analysis methods and standards applicable to the production and trade needs of rare earth concentrate products. It consists of 11 parts. -- Part

1.Determination of the total amount of rare earth oxides. The purpose is to establish a gravimetric method for determining the content of rare earth oxides in rare earth concentrates. method. -- Part

2.Determination of thorium oxide content. The purpose is to establish a plasma emission spectrometry and plasma mass spectrometry method for the determination of thorium oxide content in rare earth concentrates. Method for determining the thorium oxide content in water. -- Part

3.Determination of calcium oxide content. The purpose is to establish flame atomic absorption spectrometry, EDTA titration, inductively coupled Method for determination of calcium content in rare earth concentrates by plasma atomic emission spectrometry. -- Part

4.Determination of niobium oxide, zirconium oxide and titanium oxide content. The purpose is to establish an inductively coupled plasma optical emission spectrometry method for the determination of Method for determining the content of niobium oxide, zirconium oxide and titanium oxide in rare earth concentrate. --Part

5.Determination of Alumina Content. The purpose is to establish an inductively coupled plasma optical emission spectrometry method for the determination of oxygen in rare earth concentrates. Aluminium content method. -- Part