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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 12690.1-2022

Replacing GB/T 12690.1-2015

Chemical analysis methods for non-rare earth impurities of rare earth metals and their oxides - Part 1: Determination of carbon and sulfur contents - High frequency-infrared absorption method

稀土金属及其氧化物中非稀土杂质化学分析方法 第1部分：碳、硫量的测定 高频-红外吸收法

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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 is the first part of GB/T 12690 "Methods for Chemical Analysis of Non-Rare Earth Impurities in Rare Earth Metals and Their Oxides". GB/T 12690 The following parts have been published.

1.Determination of carbon and sulfur content High-frequency-infrared absorption method;

2.Gravimetric method for determination of ignition loss in rare earth oxides;

3.Gravimetric method for the determination of water content in rare earth oxides;

4.Determination of oxygen and nitrogen content - pulse-infrared absorption method and pulse-thermal conductivity method;

5.Determination of cobalt, manganese, lead, nickel, copper, zinc, aluminum, chromium, magnesium, cadmium, vanadium, iron;

6.Determination of iron content Potassium thiocyanate, 1,10-phenanthroline spectrophotometric method;

7.Determination of silicon content;

8.Determination of sodium content;

9.Determination of chlorine content - silver nitrate turbidimetric method;

10.Determination of phosphorus content Molybdenum blue spectrophotometry;

11.Determination of the amount of magnesium flame atomic absorption spectrometry;

12.Determination of thorium content Arsenazo III spectrophotometry and inductively coupled plasma mass spectrometry;

1 Scope

GB/T 12690.1-2022 is the Chinese national standard on chemical analysis methods for non-rare earth impurities of rare earth metals and their oxides - part 1: determination of carbon and sulfur contents - high frequency-infrared absorption method, 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 30 December 2022 by the State Administration for Market Regulation, Standardization Administration of China, and has been in force since 1 July 2023. 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 methods for the determination of carbon and sulfur content in rare earth metals and their oxides. This document is applicable to the determination of carbon and sulfur content in rare earth metals and their oxides. Measuring range (mass fraction). Carbon 0.0020%~ 1.00%; sulfur 0.0020%~0.20%.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 8170 Numerical rounding off rules and expression and determination of limit values

3 Terms and Definitions

This document does not have terms and definitions that need to be defined.

4 Method Summary

In the presence of flux, an oxygen flow is introduced into the high-frequency induction furnace to burn the sample at high temperature, and the carbon generates carbon monoxide or/and carbon dioxide. carbon gas, and sulfur produces sulfur dioxide gas. The mixed gas first enters the sulfur dioxide infrared cell to measure the sulfur content, and then undergoes catalytic oxidation, and the The sulfur dioxide is converted to sulfur trioxide and absorbed. The remaining gas enters the carbon infrared cell to determine the carbon content.

5 Reagents or Materials

5.1 Tungsten flux. wC< 0.0008%, wS< 0.0008%.

5.2 Tin flux. wC< 0.0008%, wS< 0.0008%.

5.3 Pure iron flux. wC< 0.0008%, wS< 0.0008%.

5.4 Special crucible for carbon and sulfur. burn at 1200°C for 2 hours, cool naturally and place in a desiccator for later use.

5.5 Standard sample. within the range of carbon content (mass fraction) 0.0020%~1.00%, sulfur content (mass fraction) 0.0020%~0.20% Select an appropriate certified reference sample.

5.6 Caustic soda asbestos. the particle size is 0.7mm~1.2mm (10 mesh~20 mesh).

5.7 Anhydrous magnesium perchlorate. the particle size is 0.7mm~1.2mm (10 mesh~20 mesh).

5.8 Acetone (analytical grade).