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GB/T 43603.1-2023

Methods for chemical analysis of nickel-platinum target alloys-Part 1: Determination of platinum content-Inductively coupled plasma atomic emission spectrometry

镍铂靶材合金化学分析方法 第1部分:铂含量的测定 电感耦合等离子体原子发射光谱法

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Foreword

This document complies with the provisions of GB/T 1:1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 1 of GB/T 43603 "Chemical Analysis Methods for Nickel-Platinum Target Alloys": GB/T 43603 has released the following part:

- Part 1: Determination of platinum content by inductively coupled plasma atomic emission spectrometry;

- Part 2: Determination of magnesium, aluminum, titanium, vanadium, chromium, manganese, iron, cobalt, copper, zinc, zirconium, silver, palladium, tin, samarium, lead, silicon content by inductive coupling Plasma mass spectrometry;

- Part 3: Determination of carbon content by high-frequency infrared detection method:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

This document is proposed by the China Nonferrous Metals Industry Association:

This document is under the jurisdiction of the National Nonferrous Metals Standardization Technical Committee (SAC/TC243):

This document was drafted by: Guiyan Platinum Co:, Ltd:, Guiyan Testing Technology (Yunnan) Co:, Ltd:, Shenzhen Zhongjin Lingnan Nonferrous Gold Co:, Ltd:, Beijing Nonferrous Metals and Rare Earth Application Research Institute Co:, Ltd:, Youyan Yijin New Materials Co:, Ltd:, and National Standard (Beijing) Inspection Inspection and Certification Co:, Ltd:, Zijin Mining Group Co:, Ltd:, Beikang Inspection Technology Co:, Ltd:, Chinalco Zhengzhou Nonferrous Metals Research Institute Co:, Ltd:, Daye Nonferrous Design and Research Institute Co:, Ltd:, China Inspection and Certification Group Guangxi

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Introduction

Nickel-platinum target alloy is widely used in the semiconductor industry and is a key material to ensure the performance of semiconductor devices and develop semiconductor technology: Different The nickel-platinum target alloy with platinum content has special structure and properties and plays an important role in the semiconductor manufacturing process: The nickel-platinum target alloy The impurity composition is directly related to the sputtering performance of the nickel-platinum target alloy: Therefore, the chemical composition analysis of nickel-platinum target alloy is particularly important;

GB/T 43603 is planned to consist of three parts based on different detection objects and detection methods:

- Part 1: Determination of platinum content by inductively coupled plasma atomic emission spectrometry: The purpose is to specify nickel-platinum target alloys Inductively coupled plasma atomic emission spectrometry for determination of platinum content in platinum and its applicable measurement range:

- Part 2: Determination of magnesium, aluminum, titanium, vanadium, chromium, manganese, iron, cobalt, copper, zinc, zirconium, silver, palladium, tin, lead, silicon content by inductively coupled plasma Daughter mass spectrometry: The purpose is to specify the magnesium, aluminum, titanium, vanadium, chromium, manganese, iron, cobalt, copper, zinc, zirconium, silver, palladium, tin, Inductively coupled plasma mass spectrometry for determination of samarium, lead and silicon content and applicable measurement range:

- Part 3: Determination of carbon content by high-frequency infrared detection method: The purpose is to specify the high carbon content determination in nickel-platinum target alloys:

Frequency infrared detection method and applicable measurement range:

The above-mentioned documents have clearly defined the scope of application, standardized reagents, materials, test equipment and procedures, and have been tested repeatedly by multiple laboratories:

and verification provide precision data, which enhances the consistency and comparability of data between different laboratories, and provides a basis for testing the quality of nickel-platinum target alloys:

Establish a rigorous and standardized basis for standardization:

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Chemical analysis method of nickel-platinum target alloy Part 1: Determination of platinum content Inductively coupled plasma atomic emission spectrometry Warning---Personnel using this document should have practical experience in regular laboratory work: This document does not address all possible security issues question: Users are responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated in relevant national regulations:

1 Scope

This document describes a method for the determination of platinum content in nickel-platinum target alloys:

This document applies to the determination of platinum content in nickel-platinum target alloys: Determination range (mass fraction): 1:00%~15:00%:

2 Normative reference documents

GB/T 8170

GB/T 17684

3 Terms and definitions

The terms and definitions defined in GB/T 17684 apply to this document:

4 Principles

The sample was dissolved with hydrochloric acid-nitric acid, using yttrium (Y371:029nm) as the internal standard, in dilute hydrochloric acid medium, and using inductively coupled plasma atomic emission:

Measure with a radiation spectrometer and calculate the mass fraction of platinum:

5 Reagents or materials

Unless otherwise stated, only reagents and deionized water confirmed to be of analytical grade were used in the analysis:

5:1 Nitric acid (rho=1:42g/mL):

5:2 Hydrochloric acid (rho=1:19g/mL): 5:3 Hydrochloric acid (1 9):

5:4 Platinum standard storage solution: Weigh 0:1000g of metallic platinum (wPt>=99:99%), place it in a 100mL beaker, and add 6mL of hydrochloric acid:

(5:2) and 2mL of nitric acid (5:1) are placed on the electric hot plate, heated at low temperature to dissolve completely, cooled to room temperature, transferred to a 100mL

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volumetric flask, and added 10mL hydrochloric acid (5:2), dilute to volume with water and mix well: 1 mL of this solution contains 1:0 mg of platinum:

5:5 Yttrium internal standard solution: Weigh 1:2700g yttrium trioxide (wY2O3>=99:99%), place it in a 100mL beaker, and add 30mL hydrochloric acid (5:2) Place on the electric hot plate, heat at low temperature to dissolve completely, and cool to room temperature: Move it into a 500mL volumetric flask and add 50mL hydrochloric acid

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