

ICS 77.120
CCS H 71

YS

**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 574.8-2009

Replacing YS/T 574.8-2006

**Methods for chemical analysis of zirconium powder for
electro-vacuum uses. Determination of hydrogen content-inert
gas impulse fusion heat conductivity method**

电真空用锆粉化学分析方法惰性气氛加热热导法测定氢量

(English Translation)

Issued on: December 4, 2009

Implemented on: June 1, 2010

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword
1 Scope
2 Principle of the method
3 Materials
4 Instrument
5 Step, Analysis
5.1 Warm up
5.2 Instrument Leak
5.3 Instrument Calibration
5.4 Blank analysis
5.5 Sample Analysis

Foreword

YS/T 574 "Methods for chemical analysis of zirconium powder for electro - vacuum" is divided into eight sections.

--- Determination of the total amount of zirconium and zirconium active YS/T 574.1 electric vacuum zirconium powder - Gravimetric method;

--- YS/T 574.2 electric vacuum Chemical analysis of zirconium powder sulfosalicylic acid spectrophotometric determination of iron content;

--- Determination of silicon content YS/T 574.3 electric vacuum chemical analysis of zirconium powder Molybdenum blue spectrophotometric method;

--- YS/T 574.4 electric vacuum zirconium powder chemical analysis of molybdenum blue spectrophotometric determination of phosphorus content;

Emission spectrometry measurement of calcium, magnesium content --- YS/T 574.5 electric vacuum zirconium powder chemical analysis by inductively coupled plasma;

--- YS/T 574.6 electric vacuum zirconium powder chemical analysis of Chromium Azure S spectrophotometric determination of aluminum content;

--- YS/T 574.7 electric vacuum Chemical analysis of zirconium powder with methylene blue spectrophotometric determination of sulfur content;

Determination of the amount of hydrogen heating thermal conductivity method --- YS/T

574.8 electric vacuum Chemical analysis of zirconium powder with an inert atmosphere.

This section YS/T 574 Part 8.

The partial replacement of YS/T 574.8-2006 "power vacuum combustion gravimetric method determined by chemical analysis of zirconium powder for hydrogen content" (formerly GB/T 3256.8-1983).

This portion of YS/T 574.8-2006 compared to the main changes are as follows.

- Changed the measurement method;
- Measured by the scope of the expansion of 0.005% to 2.00% to 0.005% and 3.00%;
- Complements the precision and quality assurance and control provisions.

The non-ferrous metal part by the National Standardization Technical Committee and centralized.

This in part by Western Metal Materials Co., Ltd., China Nonferrous Metals Industry Institute of Standards Metrology and Quality is responsible for drafting.

This section participated by CITIC Jinzhou Ferroalloy Co., Ltd., Northwest Nonferrous Metal Research Institute, Northwest Rare Metal Material Research Institute Drafted.

1 Scope

This section provides electrical measuring method vacuum zirconium powder hydrogen content.

This section applies to the determination of zirconium powder for electro - vacuum hydrogen content measurement range (mass fraction). 0.005% to 3.00%.

2 Principle of the method

After the sample was heated, in a sample of the hydrogen is released, use of a carrier gas of hydrogen released from the load detection system, the heat due to different gases Different conductivity, thermal conductivity based on the output electrical signal of the amount of change the system to calculate the hydrogen content in the sample.

3 Materials

3.1

Argon. purity not lower than 99.99%.

3.2

high-purity nickel foil. thickness of $0.1\text{mm} \pm 0.02\text{mm}$, each piece of foil weight of about 0.6g.

3.3

tin particles.

3.4

graphite crucible. high-purity graphite crucible.

3.5

Standard substance. should choose the appropriate reference materials, reference materials and analysis principles of chemical composition similar to the sample.

4 Instrument

Pulse heating - thermal conductivity tester. Instrument sensitivity is not less than 0.01μg/g.

5.1 Warm up

To fully preheated before instrumental analysis, so that the indicators of the instrument reaches the set value.

5.2 Instrument Leak

The use of the instrument or other auxiliary equipment leak detection program to determine the instrument without leakage phenomenon.

5.3 Instrument Calibration

Calibration standard substance (3.5), make the analysis value within the allowable fluctuation range of the standard values.

5.4 Blank analysis

Blank value of the instrument should be stable and blank value is not too high and not more than 1μg/g.

5.5 Sample Analysis

5.5.1

Table 1 were weighed according to the weight of the hydrogen content.

Table 1

Hydrogen content /% ~ 0.005 0.100 > 0.100 0.50 > 0.05 1.00 > 1.00 ~ 3.00 Sample weight/g 0.20 ~ 0.10 0.10 ~ 0.05 0.05 ~ 0.03 0.03 ~ 0.01

5.5.2 Determination

Select the optimal assay conditions, will be referred to a good sample (5.5.1), nickel foil (3.2) good package, along with tin particles (3.3) together into the injector in, automatically by the instrument shows the measurement results.