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YS

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

YS/T 539.13-2009

Replacing YS/T 539.13-2006

**Methods for chemical analysis of nickel base alloy powder. Part
13: Determination of oxygen content. The pulse heating inert
gas fusion-infrared absorption method**

镍基合金粉化学分析方法 第13部分：氧量的测定脉冲加热情气熔融-红外线吸收
法

(English Translation)

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Foreword

YS/T 539 "nickel-based alloy powder chemical analysis method" is divided into 13 parts as follows.

- Part 1. Determination of the amount of boron in the titration;
- Part 2. Determination of the amount of chrome aluminum Azure S Spectrophotometry;
- Part 3. Determination of silicon content of perchloric acid dehydration gravimetric method;
- Part 4. Determination of chromium content of ammonium persulfate oxidation titration;
- Part 5. Determination of manganese content of sodium periodate (K) oxidation spectrophotometry;
- Part 6. Determination of iron content of titanium trichloride - potassium dichromate titration;
- Part 7. Determination of cobalt content nitroso R salt spectrophotometric method;
- Part 8. Determination of copper content Neocuproine - chloroform extraction spectrophotometric method;
- Part 9. Determination of copper content of sodium thiosulfate iodometry;
- Part 10. Determination of molybdenum content - Thiocyanate spectrophotometric method;
- Part 11. Determination of cinchonine gravimetric method tungsten content;

--- Part 12. Determination of phosphorus content of n-butyl alcohol - chloroform extraction spectrophotometric method;

--- Part 13. Determination of oxygen pulse heating inert gas fusion - infrared absorption method.

This section is YS/T Part 13 539.

The partial replacement of YS/T 539.13-2006 "nickel-based alloy powder chemical analysis of pulse heating inert gas fusion coulometric titration Determination of oxygen. " this portion of YS/T 539.13-2006 phase comparator major changes are as follows.

--- The coulometric titration method to the infrared absorption method;

--- Increasing the foreword;

--- Complements the repeatability limit.

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

This section is responsible for drafting unit. Beijing Nonferrous Metal Research Institute, China Nonferrous Metals Industry Institute of Standards and Metrology and Quality.

This section is drafted. Beijing Nonferrous Metal Research Institute, Steel Research Institute.

1 Scope

YS/T 539 This part specifies the method for determination of nickel-base alloy powder oxygen content.

This section applies to the determination of nickel-base alloy powder oxygen content measurement range. 0.005% to 0.2%.

2 Method summary

Under an inert atmosphere, the graphite crucible sample is heated and melted by the pulse and oxygen in a sample in the form of carbon monoxide precipitation, CO contained in the inert gas taken off, copper oxide by oxidation of carbon monoxide to carbon dioxide will be produced, enters the infrared detector to measure the oxygen content.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade reagents and distilled or deionized water or equivalent purity.

3.1

Metal foil. nickel foil ($\text{Ni} \geq 99.9\%$) or tin capsules ($\text{Sn} \geq 99.9\%$), oxygen content ($\text{O} \leq 0.0050\%$); nickel foil before use applications CTC dip cotton scrub, cut the same size, the size quite small, dry and set aside.

3.2

CTC.

3.3

Helium (volume fraction $\geq 99.99\%$).

3.4

graphite crucible. sets of spectral pure graphite crucible.

3.5

Sample. choose between standard steel 0.0050% to 0.20% oxygen mass fraction.

3.6

magnesium perchlorate and alkali asbestos (chemically pure).

4 Instrument

Pulse heating infrared analyzer.

--- Pulse furnace. temperature greater than 2000 °C;

--- Detector sensitivity. 0.01μg/g.

5.1 Sample

When the content of oxygen in the sample $\text{O} \leq 0.02\%$, a sample was weighed 0.15g ~ 0.25g, accurate to 0.001g; when the content of oxygen in the sample $\text{O} > 0.02\%$, a sample was weighed 0.10g ~ 0.20g, accurate to 0.001g. Sample with 1.0g (accurate to 0.001g) metal foil (3.1) package.

5.2 Determination of the number of Independent of the two measurements, the mean value.

5.3 Warmed up

Required equipment specification, switch on the instrument, and preheating system checks.

5.4 Calibration Blank

5.4.1

Open pulse furnace, the crucible (3.4) placed under electrodes, 1.0g (accurate to 0.0001g) metal foil (3.1), placed in sample loading Inside.