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YS

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

YS/T 500-2013

Replacing YS/T 500-2006

**Determination of cerium content in cerium-tungsten alloys
Oxidation, Reduction titration**

钨铈合金中铈量的测定氧化还原滴定法
(English Translation)

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Table of Contents

Foreword
1 Scope
2 Method summary
3 Reagents

Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

Instead of the standard YS/T 500-2006 "Determination of tungsten alloys Cerium Cerium - redox volumetric method." This standard YS/T 500-Compared to 2006, the main changes are as follows.

- The "redox volumetric method" to "redox titration";
- Modify the scope of the sample and process specification, adds stock and silk material;
- A corresponding increase in the sample processing reagent;
- Modify the sample weight, depending on the content of the sample amount weighed different;
- Specifies the number of measurements;
- Increasing the blank test;
- Change the representation of the solution concentration.

This standard by the national non-ferrous metals Standardization Technical Committee (SAC/TC243) centralized.

This standard was drafted. Beijing General Research Institute of Mining and Metallurgy, the North Mine New Material Technology Co., Ltd., China Nonferrous Metals Industry Quality Standards and Metrology Institute the study.

1 Scope

This standard specifies the method for the determination of the amount of cerium tungsten alloy.

This standard applies to the determination of tungsten alloys Cerium Cerium amount. Measuring range. 0.50% to 5.00%.

2 Method summary

Sample hydrogen peroxide dissolved in an excess of aqueous ammonia, to generate cerium $\text{Ce}(\text{OH})_3$ precipitate, heated complete conversion of $\text{Ce}(\text{OH})_4$ precipitated Isolation and tungsten. In sulfuric acid solution with silver nitrate as a catalyst, plus ammonium persulfate oxidation of the Ce^{3+} Ce^{4+} , with phenanthroline as indicator.

Ferrous ammonium sulfate standard solution titration, determination of cerium content.

3 Reagents

This standard reagents were analytical grade, the water is distilled water.

3.1

Hydrogen peroxide (300g/L).

Aqueous ammonia 3.2 ($\rho = 0.9\text{g/mL}$).

3.3

ammonia (119).

3.4

nitric acid ($\rho = 1.42\text{g/mL}$).

3.5

sulfate ($\rho = 1.84\text{g/mL}$).

3.6

ammonium persulfate.

3.7

silver nitrate solution (20g/L).

3.8

sodium carbonate solution (300g/L).

3.9

sulfuric acid - a mixture of nitric acid (13).

3.10

Sodium hydroxide solution (20g/L).

3.11

hydrochloric acid (11).

3.12

Ethanol (191).

3.13

phenanthroline solution (15g/L). Weigh 1.5g Phen was dissolved in a small amount of absolute ethanol with 0.005mol/L ammonium ferrous sulfate the solution was diluted to 100mL, stored in brown dropper bottle.

3.14

cerium standard solution (1mg/mL). Weigh ceria 1.2284g [w (CeO₂/REO) ≥99.9%] in 600mL beaker, Add a small amount of water wet, add 50mL sulfuric acid (3.5) and 20mL of hydrogen peroxide (3.1), cerium oxide, stir, cover the surface of the pan, over low heat to dissolve completely, we put in a beaker covered with a glass surface tripod pan and continue heating until white smoke 30min ~ 40min, the excess peroxide Hydrogen decomposed. Remove cooling to room temperature, diluted with water under constant stirring to about a 500 mL, cooled and transferred to 1000mL volumetric flask the diluted with water to the mark.

3.15

ferrous ammonium sulfate standard solution (0.005mol/L). Weigh ferrous ammonium sulfate 4g in 600mL beaker, add distilled water 500mL solution Solution, add 50mL sulfuric acid (3.5) (turbid to be filtered), cooled Brown moved to 1000mL volumetric flask, diluted with water to the mark.

3.16

ammonium ferrous sulfate standard solution of cerium titer (T).

Imbibe 25mL cerium standard solution (3.14) in 250mL conical flask, 6mL sulfuric acid (3.5), dilute with water to 80mL