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YS

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

YS/T 514.7-2009

Replacing YS/T 514.12-2006

**Methods for chemical analysis of high-titanium slag and rutile.
Part 7: Determination of calcium oxide and magnesium oxide
content. Flame atomic absorption spectrometry**

高钛渣、金红石化学分析方法 第7部分：氧化钙和氧化镁量的测定 火焰原子吸收
光谱法(有黑印，不清晰)

(English Translation)

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Foreword

YS/T 514 "high titanium slag and rutile chemical analysis method" is divided into 10 parts.

- Part 1. Determination of titanium dioxide content of ammonium ferric sulfate titration;
- Part 2. Determination of total iron content of dichromate method;
- Part 3. Determination of sulfur content of high frequency infrared absorption method;
- Part 4. Determination of the amount of silica weighing method, the molybdenum blue spectrophotometric method;
- Part 5. aluminum oxide content - EDTA titration;
- Part 6. Determination of a manganese oxide content by flame atomic absorption spectrometry;
- Part 7. calcium oxide, magnesium oxide content - Flame atomic absorption spectrometry;
- Part 8. Determination of the amount of phosphorus antimony molybdenum blue spectrophotometric method;
- Part 9. calcium oxide, magnesium oxide, manganese oxide, phosphorus, chromium oxide and vanadium pentoxide content - Inductively coupled plasma Daughters emission spectrometry;
- Part 10. Determination of the amount of carbon frequency infrared absorption method.

This section YS/T 514 Part 7.

The partial replacement of YS/T 514.12-2006 Determination of "high titanium slag and rutile chemical analysis methods and CyDTA EGTA titration of oxygen Calcium and magnesium oxide content. " this portion of YS/T 514.12-2006 compared to the main changes are as follows.

- By flame atomic absorption spectrometry instead of the original titration;
- Sand bath using a platinum crucible plus hydrofluoric acid, perchloric acid dissolved sample;
- Increasing the precision and quality assurance and control provisions.

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

This section is responsible for drafting unit. Zunyi Titanium Co., Ltd., China Nonferrous Metals Industry Standards and Metrology Institute for Quality.

Participated in the drafting of this section. Jinchuan Group Co., Ltd. Fushun Titanium.

1 Scope

YS/T 514 This part provides high titanium slag, calcium oxide, magnesium oxide content determination of rutile.

This section applies to high titanium slag and rutile determination of calcium oxide, magnesium oxide content. Measurement range. calcium oxide. 0.10% to 7.0%; oxide Mg. 0.020% to 8.0%.

2 Method summary

The high titanium slag is placed in a platinum crucible with perchloric acid, hydrofluoric acid is dissolved; rutile dissolved by microwave digestion. The test solution was heated to dissolve after Take strong perchlorate smoke, remove, add hydrochloric acid dissolved salts coolish, adding strontium nitrate masking interfering elements. Atomic absorption spectrophotometer, Wavelength at 422.7nm and 285.2nm, air - acetylene flame measured calcium, magnesium absorbance, thereby calculating the test compound calcium oxide, magnesium oxide Amount.

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

perchloric acid (rho about 1.76g/mL).

3.2

hydrofluoric acid (rho about 1.15g/mL), pure class distinctions.

3.3

HCl (1 + 1).

Nitrate 3.4 (GR).

3.5

strontium nitrate solution (40g/L). Weigh 20g strontium nitrate, dissolved in water and transferred to 500mL volumetric flask, dilute with water to volume, and mix.

3.6

hydrochloric acid (rho about 1.19g/mL).

3.7

Calcium standard stock solution. Weigh 0.2497g reference reagent calcium carbonate (pre-bake at 105 °C after 1h, cooled to room in a desiccator Temperature), placed in 300mL beaker, add 20mL water, was added dropwise hydrochloric acid (3.6) until completely dissolved, and then 10mL excess hydrochloric acid (3.6), boiled to remove Carbon dioxide, after cooling transferred 100mL volumetric flask, dilute to the mark, shake. This solution 1mL containing 1.0mg of calcium.

3.8

Magnesium standard stock solution. Weigh 0.1000g of magnesium (mass fraction $\geq 99.99\%$), placed in 300mL beaker, add 20mL hydrochloric acid (3.6) to dissolve. Moved into 1000mL volumetric flask. Dilute with water to volume, and mix. This solution 1mL containing 0.1mg of magnesium.

3.9

Calcium standard solution. Pipette 10.00mL calcium standard stock solution (3.7) in 200mL volumetric flask, dilute with water to volume, and mix.

This solution 1mL containing 50 μ g calcium.

3.10

Magnesium standard solution. Pipette 10.00mL magnesium standard stock solution (3.8) in 100mL volumetric flask, dilute with water to volume, and mix.

This solution 1mL containing 10 μ g magnesium.

4 Instrument

4.1

Atomic absorption spectrometer, with calcium, magnesium hollow cathode lamp.

Under optimum working conditions for those who can reach the following indicators can be used.

--- Characteristic concentration. a solution in the matrix is consistent with the measured solution, the concentration of Ca features should not exceed 0.30 μ g/mL; Mg of Characteristic concentration should not exceed 0.02 μ g/mL.

--- Precision. standard solution with the highest concentration of 10 times the absorbance measurements, the standard deviation should not exceed the average absorbance of 1.0%;