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NONFERROUS METAL INDUSTRY STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 73.060

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YS/T 820.16-2012

**Methods for chemical analysis of laterite nickel ores -
Part 16: Determination of carbon and sulfur content -
High frequency combustion with infrared absorption
spectrometry**

红土镍矿化学分析方法

第 16 部分：碳和硫量的测定 高频燃烧红外吸收光谱法

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Methods for chemical analysis of laterite nickel ores -

Part 16: Determination of carbon and sulfur content -

High frequency combustion with infrared absorption spectrometry

1 Scope

This part of YS/T 820 specifies the method for the determination of carbon and sulfur content in laterite nickel ore.

This part applies to the determination of carbon and sulfur content in laterite nickel ore. Measuring range: carbon 0.0060%~0.40%, sulfur 0.0020%~0.20%.

2 Method summary

The sample is heated and burned in the oxygen flow of the high-frequency induction furnace; the generated carbon dioxide and sulfur dioxide are carried by the oxygen to the infrared analyzer for measurement. In the measuring chamber, carbon dioxide and sulfur dioxide absorb infrared energy of a certain wavelength; the absorption energy is proportional to its concentration. According to the change of absorption energy tested by the detector, the carbon and sulfur content can be measured.

3 Reagents and materials

Unless otherwise stated, only reagents confirmed to be analytical reagents were used in the analysis.

3.1 Pure iron fluxing agent: particle size<1.25 mm, C<0.0005%, S<0.0005%.

3.2 Tungsten-tin mixed fluxing agent: the ratio is 9:1, C<0.0010%, S<0.0005%.

3.3 Barium carbonate shall be fine powder with a content of more than 99.9%. Dry at 105 °C for 3 h and cool in a desiccator.

3.4 Standard sample: certified reference material with carbon and sulfur content similar to the sample to be tested.

Note: It is better to use ore (or iron ore) reference material with similar composition.

3.5 The ceramic crucibles shall be burned for 4 hours in a high-temperature heating furnace higher than 1000 °C, or burned with oxygen until the blank value is the lowest; then, cool them in a desiccator for later use.

4 Instruments

High-frequency induction infrared carbon and sulfur analyzer.

The instrument shall be able to reach the following indicators:

- Power of the high-frequency furnace: 1.0 kW~2.5 kW;
- Frequency: greater than 6.0 MHz;
- Sensitivity of the detector: higher than 0.0001%.

5 Samples

The particle size of the samples shall be less than 160 µm; bake them in an oven at 105 °C~110 °C for 2 h, and cool them to room temperature in a desiccator.

6 Analysis steps

6.1 Sample

Weigh 0.10 g sample; the weight shall be accurate to 0.0001 g.

6.2 Number of measurements

Independently perform two measurements; take the average value.

6.3 Instrument Preparation

Prepare the instrument for use according to the recommended conditions for the instrument. Adjust and stabilize the instrument by burning several samples similar to the one to be tested.

6.4 Blank value calibration

Weigh 1.0 g of pure iron fluxing agent (3.1) and 1.0 g~1.5 g of tungsten-tin mixed fluxing agent (3.2) in turn; place them in the burnt crucible (3.5) to measure the amounts of carbon and sulfur; then obtain the blank values of

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