

ICS 77.120.40  
CCS H 13

**YS**

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

**YS/T 707-2009**

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**Methods for chemical analysis of ferronickel carbonyl powder.  
Determination of nickel content. Dimethylglyoxime gravimetric  
method**

羰基镍铁粉化学分析方法 镍量的测定 丁二酮肟重量法

**(English Translation)**

**Issued on: December 4, 2009**

**Implemented on: June 1, 2010**

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**Issued by: Ministry of Industry and Information Technology**

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### Foreword

This revised standard adopts ISO 6352. 1985 (1) "Determination of nickel content of nickel-iron dimethylglyoxime gravimetric method." and ISO 6352. 1985 compared to (1), this standard has the following main changes.

- Measurement range from 15% to 60% adjusted to 15% to 80%;
- Specimen sample weight by the 3.9 ~ 4.1g adjusted to 1.000g;
- Canceled Appendix A, determination of mixed nickel content in the filtrate and text merge atomic absorption spectrometry.
- Supplementary terms of quality assurance and control, increasing the repeatability limit.

The Standard Appendix A and Appendix B is an informative annex.

This standard by the National Standardization Technical Committee of non-ferrous metals and centralized.

This standard by the Jinchuan Group Ltd. is responsible for drafting.

This standard by the Beijing General Research Institute of Mining and Metallurgy, Beijing Nonferrous Metal Research Institute participated in the drafting.

### 1 Scope

This standard specifies the method for determination of nickel carbonyl iron powder of nickel content this standard is applicable to the determination of nickel carbonyl iron powder in the amount of nickel. Measuring range. 15% to 80%.

### 2 Method summary

Mixed acid sample with hydrochloric acid nitric acid, perchloric acid decomposition of ammonia in the medium, nickel dimethylglyoxime to form a red precipitate of nickel

dimethylglyoxime.

After mixing a precipitate was dissolved acid secondary precipitates were filtered, washed at 150 °C electric heated blast drying oven to Constant weight to calculate the amount of nickel. The filtrate was mixed in the amount of nickel were corrected using atomic absorption spectrometry.

### 3 Reagents

Unless otherwise specified, the reagents were analytical reagent, which is a distilled water or equivalent purity water.

#### 3.1

ammonium hydrogen fluoride.

#### 3.2

acetic acid (1 + 1).

#### 3.3

hydrochloride (rho1.19g/mL).

Hydrochloride 3.4 (1 + 9).

Nitrate 3.5 (rho1.42g/mL).

#### 3.6

nitric acid (1 + 1).

#### 3.7

perchloric acid (rho1.67g/mL).

#### 3.8

Ammonia (rho0.90g/mL).

#### 3.9

dimethylglyoxime in ethanol (10g/L), filtered use.

#### 3.10

tartaric acid solution (500g/L), filtered to use.

#### 3.11

mixed acid. hydrochloric acid, nitric acid, water volume ratio 2.1.3.

#### 3.12

Nickel standard solution.

Weighed 0.1000g of nickel (Ni mass fraction  $\geq 99.95\%$ ), placed in a beaker of 400mL,

20mL of nitric acid was added (3.6), cover on the surface of the dish, low dissolved to a small volume, after cooling water flushed face and Beibi pan, heat to dissolve the salts, cooled to room temperature shifted 1000mL volumetric flask, diluted with water to the mark. This solution 1mL containing 0.1mg nickel.

## 4 Instrument

### 4.1

atomic absorption spectrometer (with a nickel hollow cathode lamp).

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

--- Sensitivity. basically the same test solution and measurement solution, features copper concentration should not exceed 0.09 $\mu$ 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%;

The lowest concentration of standard solution used (instead of "zero" standard solution) absorbance measured 10 times, and the standard deviation should not exceed the maximum concentration 0.5% of the mean absorbance of the standard solution.

--- Linear curve. The curve is divided into five sections according to concentration, absorbance difference between the absorbance difference between the highest and the lowest segment of the segment Ratio of not less than 0.80.