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**YS**

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

**YS/T 710.1-2009**

Replacing YS/T 256-2000

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**Method for chemical analysis of cobalt oxide. Part 1:  
Determination of cobalt content. Potentiometric method**

氧化钴化学分析方法 第1部分：钴量的测定电位滴定法

**(English Translation)**

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### Foreword

YS/T 710 "cobalt oxide chemical analysis method" is divided into six sections.

- Part 1. Determination of cobalt content potentiometric titration;
- Part 2. Determination of sodium content by flame atomic absorption spectrometry;
- Part 3. Determination of the amount of sulfur by high frequency combustion infrared absorption method;
- Part 4. Determination of arsenic content by atomic fluorescence spectrometry;
- Part 5. Determination of silicon content - Molybdenum blue spectrophotometric method;
- Part 6. calcium, cadmium, copper, iron, magnesium, manganese, nickel, lead and zinc content - Inductively coupled plasma atomic emission spectrometry.

This section YS/T Part 1 710.

The partial replacement of YS/T 256-2000 "cobalt oxide" in Appendix A. Compared with YS/T 256-2000 "cobalt oxide" in Appendix A, this section the main changes are as follows.

- Potentiometric titration of cobalt potassium nitrite alternative gravimetric method;
- Complements the precision and quality assurance and control provisions.

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

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## 1 Scope

YS/T of the provisions of section 710 of the method for the determination of the amount of cobalt oxide cobalt.

This section applies to the determination of cobalt content of cobalt oxide. Measurement range. 65.00% - 75.00%.

## 2 Method summary

Ammonia solution, the standard solution of potassium cyanide with iron cobalt (II) is oxidized to cobalt (III), impurity manganese (II) is quantitatively the presence of potassium ferricyanide Oxidation of manganese (III), excess potassium ferricyanide and then back titration cobalt standard solution, the potential jump to reach the end. The results for the amount of cobalt, and manganese together After the calculated amount of manganese minus factor correction. Manganese Determination result is less than 0.10%, the amount of cobalt results without considering the impact of manganese content factors.

### 3.1 Commercially available reagents

#### 3.1.1

hydrochloric acid ( $\rho$ 1.19g/mL).

#### 3.1.2

nitrate ( $\rho$ 1.42g/mL).

#### 3.1.3

perchloric acid ( $\rho$ 1.62g/mL).

#### 3.1.4

ammonium chloride.

### 3.2 Solution

Ammonia - ammonium citrate mixture. Weigh 50g of ammonium citrate is dissolved in water, aqueous ammonia added 350mL ( $\rho$ 0.90g/mL), water volume to 1000mL, shake well and set aside.

### 3.3 Standard solution

#### 3.3.1

Cobalt standard solution. Weigh accurately pure cobalt metal (cobalt content  $\geq 99.99\%$ ) 3.0000g placed in 400mL beaker was slowly Added 30mL (1 + 1) nitric acid, low dissolved

by heating, blowing a small amount of boiling water, after cooling transferred to 1000mL volumetric flask with water to volume, shake uniform. This standard solution 1mL containing 3.0mg of cobalt.

### 3.3.2

ferricyanide standard solution (Ba  $[K_3Fe(CN)_6]$  ~0.05mol/L). Weigh 17g of potassium ferricyanide dissolved in water, filtered water Dilute to 1000mL, shake, stored in a brown bottle and set aside.

### 3.3.3

Calibration standard solution of potassium ferricyanide. 5g of ammonium chloride (3.1.4) in a 250mL beaker, acid burette accurate pipetting 20.00mL ferricyanide standard solution (3.3.2), was added 80mL ammonia - a mixture of ammonium citrate (3.2), in the automatic potentiometric titrator Titrated with cobalt standard solution (3.3.1), the potential jump to reach the end. Parallel determination three times within an allowable tolerance range averaged.

Volume according to equation (1) calculate the standard solution of potassium ferricyanide of cobalt ratio (K).

$$K = V_p / V_0$$

Where.

Volume consumed  $V_p$  --- cobalt standard solution titration, in milliliters (mL);

$V_0$  --- adding iron potassium cyanide standard solution volume, in milliliters (mL).

3 Titration consumes cobalt standard solution is not greater than the volume of the poor 0.10mL.