

ICS 77.120.90

CCS H 64

**YS**

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

**YS/T 360.2-2011**

Replacing YS/T 360-1994

---

**Methods of chemical analysis for ilmenite concentrate. Part 2:  
Determination of total iron content. Potassium dichromate  
titration**

钛铁矿精矿化学分析方法 第2部分：全铁量的测定 重铬酸钾滴定法

**(English Translation)**

**Issued on: December 20, 2011**

**Implemented on: July 1, 2012**

---

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

## Table of Contents

- Foreword
- 1 Scope
- 2 Method summary
- 3 Reagent
- 4 Sample
- 5 Analysis steps
  - 5.1 Sample

### Foreword

YS/T 360 "ilmenite concentrate chemical analysis method" is divided into six parts.

- Part 1. Determination of titanium dioxide - Ammonium sulfate titration;
- Part 2. Determination of total iron content - Potassium dichromate titration;
- Part 3. Determination of the amount of ferrous oxide - Potassium dichromate titration;
- Part 4. Determination of the amount of alumina - EDTA titration;
- Part 5. Determination of silicon dioxide - Mo - Mo - blue spectrophotometric method;

Part 6. Determination of calcium oxide, magnesium oxide, and phosphorus content - Plasma emission spectrometric method.

This section is part 2 of YS/T 360.

This part replaces the fourth part of YS/T 360-1994 "Chemical Analysis Method for Titanium Ore (Concentrate) Concentrate" (YB878-76) "All iron of the determination".

Compared with YS/T 360-1994, the main changes are as follows.

Specified range. 1% to 45%.

- the formula used in international units of measurement;
- reaffirm the allowable difference;
- increase the repeatability limit.

This standard is proposed by the National Committee for Standardization of Nonferrous Metals (SAC/TC243).

The drafting unit of this standard. Zunyi Titanium Industry Co., Ltd., Jinchuan Group Co.,

Ltd., Yunnan Xinli Nonferrous Metals Co., Ltd., Fushun Titanium Industry Co., Ltd., China Nonferrous Metals Industry Standard Measurement Quality Institute.

## 1 Scope

This part of YS/T 360 specifies the method for the determination of total iron content in ilmenite concentrates.

This section applies to the determination of total iron content in ilmenite concentrates. The measurement range is 1.00% to 45.00%.

## 2 Method summary

The sample was melted with potassium pyrophosphate and acid leached. In the hot dilute hydrochloric acid solution, the excess amount of stannous chloride was used to reduce the ferric chloride to ferrous iron. Too the amount of stannous chloride was oxidized with mercuric chloride, adding sulfuric acid-phosphoric acid mixed acid, diphenylamine sulfonate as indicator, and titration solution with potassium dichromate standard Liquid titration to stable purple for the end.

## 3 Reagent

### 3.1

Potassium pyrophosphate.

### 3.2

Hydrochloric acid (1 1).

### 3.3

Hydrochloric acid (5 95).

### 3.4

Sulfuric acid-phosphoric acid mixed acid. 150 mL of sulfuric acid (rho about 1.84 g/mL) was slowly poured into 700 mL of water with stirring, cooled to room temperature, Add 150 mL of phosphoric acid (rho about 1.70 g/mL) and mix well.

### 3.5

Stannous chloride solution. 10 g of stannous chloride ( $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ ) was weighed in 10 mL of hot hydrochloric acid (rho about 1.19 g/mL) Diluted to 100 mL. filter. When used with the preparation.

### 3.6

solution of diphenylamine sulfonate (2g/L).

### **3.7**

Mercury dichloride. Saturated solution.

### **3.8**

potassium dichromate standard titration solution ( $c(1/6K_2Cr_2O_7) = 0.03000\text{mol/L}$ ). Weigh 2.9418g reference reagent potassium dichromate (in advance 150 °C bake 2h, and placed in a dryer to cool to room temperature), dissolved in water, into the 2000mL volumetric flask, diluted with water to the mark, Mix well.

## **4 Sample**

### **4.1**

The sample size should not be greater than 90 $\mu\text{m}$ .

### **4.2**

samples in advance at 105 °C ~ 110 °C baking 2h, placed in a dryer, cooled to room temperature.

### **5.1 Sample**

Weigh 0.200g sample, accurate to 0.0001g.