

ICS 77.120.70
CCS H 13

YS

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

YS/T 281.3-2011

Replacing YS/T 281.3-1994

**Methods for chemical analysis of cobalt. Part 3: Determination
of silicon content. Molybdenum blue spectrophotometry**

钴化学分析方法 第3部分：硅量的测定 钼蓝分光光度法

(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

Foreword

YS/T 281 "cobalt chemical analysis method" is divided into the following 20 parts.

Part 1. Determination of iron content - Sulfosalicylic acid spectrophotometric method Part 2. Determination of aluminum content - Chromazu S spectrophotometric method Part 3. Determination of silicon content - Molybdenum blue spectrophotometric method Part 4. Determination of arsenic content - Molybdenum blue spectrophotometric method - Part 5. Determination of phosphorus content - Molybdenum blue spectrophotometric method Part 6. Determination of magnesium content - Flame atomic absorption spectrometric method - Part 7. Determination of zinc content - Flame atomic absorption spectrometric method Part 8. Determination of cadmium content - Flame atomic absorption spectrometric method Part 9. Determination of lead content - Flame atomic absorption spectrometric method Part 10. Determination of nickel content - Flame atomic absorption spectrometric method - Part 11. Determination of copper and manganese - Flame atomic absorption spectrometric method - Part 12. Determination of arsenic, antimony, bismuth, tin and lead - Electrothermal atomic absorption spectrometry - Part 13. Determination of sulfur content - High frequency induction furnace combustion infrared absorption method - Part 14. Determination of carbon content - High frequency induction furnace combustion infrared absorption method - Part 15. Determination of arsenic, antimony and bismuth - Hydride generation - atomic fluorescence spectrometry - Part 16. Determination of the amount of arsenic, cadmium, copper, zinc, lead, bismuth, tin, antimony, silicon, manganese, iron, nickel, aluminum and magnesium.

Spectrum method

- Part 17. Determination of aluminum, manganese, nickel, copper, zinc, cadmium, tin, antimony, lead and bismuth inductively coupled plasma mass spectrometry - Part 18. Determination of sodium content - Flame atomic absorption spectrometric method - Part 19. Determination of calcium, magnesium, manganese, iron, cadmium and zinc - Inductively coupled plasma emission spectrometric method - Part 20. Determination of the amount of oxygen - Infrared absorption method this section is part 3 of YS/T 281.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces YS/T 281.3-1994 "cobalt chemical analysis method molybdenum blue spectrophotometric determination of silicon content". With YS/T 281.3-1994, this section has the following main changes.

- the determination range from 0.0005% to 0.0025% modified to 0.00050% to 0.0050%;
- The text format has been modified to supplement the quality assurance and control terms, increasing the repeatability and reproducibility limits;
- Added the requirements for the test report.

This part of the National Nonferrous Metals Standardization Technical Committee (SAC/TC243) proposed and centralized.

This standard is responsible for drafting units. Jinchuan Group Co., Ltd., Beijing Mining and Metallurgy Research Institute.

This part is responsible for drafting unit. Jinchuan Group Co., Ltd.

This part participates in the drafting unit. Shenzhen Greene US High-tech Co., Ltd., Beijing Mining and Metallurgy Research Institute, Yingdejia Jia Metal Division Technology Limited.

This part of the main drafters. Wen Zhanjie, Lv Qingcheng, Dong Liping, Du Yuchun, Wang Li, Wei Qiong, Feng Xianjin, Gao Yingjian, Wu Chi Chun, Luo Yueying.

This part of the previous version of the standard to replace the release of the situation.

YS/T 281.3-1994.

Cobalt chemical analysis method Part 3. determination of silicon content - molybdenum blue spectrophotometric method WARNING. Personnel using this standard should have experience working in a regular laboratory. This standard does not indicate all possible security issues. Make it is the responsibility of the user to take appropriate safety and health measures and to ensure compliance with the conditions set forth in the relevant national regulations.

1 Scope

This part of YS/T 281 specifies the determination of silicon content in cobalt.

This part applies to the determination of silicon content in cobalt. Measuring range. 0.00050% ~ 0.0050%.

2 Method summary

The sample was dissolved in nitric acid and evaporated to a viscous state, and hydrofluoric acid was added to render the insoluble silica in the soluble monosilicic acid. in pH1.0 ~ 1.5,

silicon and ammonium molybdate to form silicon molybdenum yellow heteropoly acid, sulfuric acid medium with n-butanol extraction, organic phase with sulfuric acid and chlorine the stannousite was reduced to silicon molybdenum blue by measuring silicon molybdenum yellow and its absorbance was measured at a wavelength of 630 nm.

3 Reagent

Unless otherwise specified, the reagents used are high-purity reagents, preparation solutions and analytical water are secondary distilled water or comparable purity laboratory Water. After the preparation of reagents are stored in plastic bottles.

3.1

Ammonium molybdate.

3.2

sulfuric acid amine, excellent grade pure.

3.3

stannous chloride, excellent grade pure.

3.4

boric acid.

3.5

citric acid, excellent grade pure.

3.6

Hydrochloric acid ($\rho = 1.19 \text{ g/mL}$).

3.7

nitric acid ($\rho = 1.42 \text{ g/mL}$).

3.8

Sulfuric acid ($\rho = 1.84 \text{ g/mL}$).

3.9

hydrofluoric acid ($\rho = 1.15 \text{ g/mL}$).

3.10

Ammonium hydroxide ($\rho = 0.90 \text{ g/L}$).

3.11

n-butanol, analytical grade.

3.12

hydrochloric acid (1 1).

3.13

nitric acid (1 1).

3.14

sulfuric acid (1 3).

3.15

sulfuric acid (7 93).

3.16

Sulfuric acid (1.5 98.5).

3.17

hydrofluoric acid (1 1).

3.18

Ammonia (1 1).

3.19

boric acid saturated solution. boronic acid (3.4) preparation.