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YS

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

YS/T 226.3-2009

Replacing YS/T 226.4-1994

**Methods for chemical analysis of selenium. Part 3:
Determination of aluminum content. Chrome azurol S-Cetyl
trimethyl ammonium bromide absorption photometric method**

硒化学分析方法 第3部分：铝量的测定铬天青S-溴代十六烷基吡啶分光光度法
(English Translation)

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Foreword

YS/T 226 "selenium chemical analysis method" is divided into 13 parts.

- Part 1. Determination of bismuth content - Hydride Generation - Atomic Fluorescence Spectrometry
- Part 2. Determination of antimony content Hydride Generation - Atomic Fluorescence Spectrometry
- Part 3. Determination of aluminum content Chromazurol S- cetylpyridinium bromide spectrophotometric method
- Part 4. Determination of mercury content of dithizone - CTC colorimetric titration
- Part 5. Determination of the amount of silicon molybdenum blue spectrophotometry
- Part 6. Determination of sulfur content symmetrical diphenyl semicarbazide spectrophotometry
- Part 7. Determination of magnesium content - Flame atomic absorption spectrometry
- Part 8. Determination of copper content - Flame atomic absorption spectrometry
- Part 9. Determination of iron content by flame atomic absorption spectrometry
- Part 10. Determination of nickel content by flame atomic absorption spectrometry
- Part 11. Determination of lead content by flame atomic absorption spectrometry
- Part 12. Determination of the amount of selenium sodium thiosulfate volumetric method
- Part 13. silver, aluminum, arsenic, boron, mercury, bismuth, copper, cadmium, iron, gallium, indium, magnesium, nickel, lead, silicon, antimony, tin, tellurium, titanium, zinc contents Inductively Coupled Plasma Mass Spectrometry this section YS/T Part 3 226.

The partial replacement of YS/T 226.4-1994 "selenium aluminum content chromazurol S- cetylpyridinium bromide spectrophotometric method." versus YS/T 226.4-1994 compared, this section there are major changes as follows.

--- Supplementary terms of quality assurance and control;

--- Increase the repeatability limit, the reproducibility limit to allow the poor;

--- Text format has been modified.

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

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1 Scope

This section YS/T 226 specifies the method for determination of selenium in aluminum content.

This section applies to the determination of selenium in aluminum content. Measurement range. 0.0002% to 0.002%.

2 Method summary

Volatile selenium in sulfuric acid medium was removed, residue was dissolved in a small amount of hydrochloric acid, acetic acid in pH6 - ammonium acetate buffer medium aluminum and CAS-bromo-S-Generation cetylpyridinium generated blue complex at the wavelength at 600nm measured absorbance.

Copper, iron interference by morpholine was added phenanthroline - Ascorbic Acid. Containing respectively 50µg lead, magnesium, nickel, arsenic, antimony, bismuth, boron, tellurium, tin, Mercury, 20µg and 200µg selenium silicon not interfere with the determination of aluminum.

3 Reagents

The standard water is deionized water, conductivity is not more than $6.67 \times 10^{-2} \mu\text{S} \cdot \text{cm}^{-1}$.

Nitrate 3.1 (rho1.42g/mL).

Nitric acid 3.2 (3 + 2).

3.3

sulfate (rho1.84g/mL).

3.4

sulfate (1 + 1).

3.5

hydrochloride (rho1.19g/mL).

3.6

hydrochloric acid (1 + 20).

Ammonia 3.7 (4 + 1).

3.8

Ascorbic acid (10g/L).

3.9

phenanthroline morpholino solution (10/L). Weigh 1g phenanthroline morpholino into 200mL beaker, add 1mL of hydrochloric acid and a small amount of water to dissolve, add water to 100mL. And adjusted with hydrochloric acid to about pH2.

3.10

cetylpyridinium bromide (abbreviated CPB) solution (4g/L). Weigh 0.8gCPB dissolved in 200mL warm water.

3.11

chromium azure S (referred to as CAS) solution (1g/L). Weigh 0.2gCAS dissolved in 200mL of water.

3.12

CAS-CPB mixture. CAS said solution and CPB press (1 + 1) mixing, shake, filter back (with once a week).

3.13

acetic acid (4mol/L). acetic acid Pipette 23mL, diluted with water to 100mL.

3.14

ammonium acetate (4mol/L). Weigh ammonium acetate 154g, dissolved in water and diluted to 500mL.

3.15

acetic acid - ammonium acetate buffer solution. acetic acid solution (3.13) and ammonium acetate solution (3.14) at a volume ratio (1 + 10) mixing, shake, storage Stored in polyethylene bottles for use.

3.16

thymol blue solution (2g/L). Weigh 0.2g of thymol blue was dissolved in 50mL of ethanol, diluted with water to 100mL.

3.17

potassium sulfate.

3.18

aluminum standard solution.

3.18.1

aluminum standard stock solution. Weigh 0.1000g of aluminum (Al mass fraction $\geq 99.9\%$), placed in 100mL beaker, add 10mL hydrochloric acid (1 + 1), low temperature to dissolve completely cooled and transferred to 1000mL volumetric flask, dilute with water to the mark. This solution 1mL containing 100 μ g aluminum.