

ICS 73.060
CCS D 04

YS

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

YS/T 820.17-2012

**Methods for chemical analysis of laterite nickel ores. Part 17:
Determination of arsenic, antimony and bismuth contents.
Hydride generation-atomic fluorescence spectrometry**

红土镍矿化学分析方法 第17部分：砷、锑、铋量的测定氢化物发生-原子荧光光谱法

(English Translation)

Issued on: January 1, 1970

Implemented on: January 1, 1970

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword
1 Scope
2 Method summary
3 Reagents

Foreword

This section drafted in accordance with GB/T 1.1-2009 given rules.

YS/T 820-2012 "Methods for chemical analysis of nickel laterite ore" is divided into 26 parts.

- Part 1. Determination of nickel content by flame atomic absorption spectrometry;
- Part 2. Determination of the amount of nickel dimethylglyoxime spectrophotometry;
- Part 3. Determination of total iron content of dichromate method;
- Part 4. Determination of phosphorus content - Molybdenum blue spectrophotometric method;
- Part 5. Determination of cobalt content by flame atomic absorption spectrometry;
- Part 6. Determination of copper content - Flame atomic absorption spectrometry;
- Part 7. Determination of calcium and magnesium content by flame atomic absorption spectrometry;
- Part 8. Determination of the amount of silica silicon potassium fluoride titration;
- Part 9. scandium, cadmium determination by inductively coupled plasma - mass spectrometry;
- Part 10. calcium, cobalt, copper, magnesium, manganese, nickel, zinc and phosphorus content - Inductively Coupled Plasma - Atomic Emission Spectrometry;
- Part 11. Determination of the amount of fluorine and chlorine ion chromatography;
- Part 12. Determination of manganese content by flame atomic absorption spectrometry;
- Part 13. Determination of lead content by flame atomic absorption spectrometry;
- Part 14. Determination of zinc content - Flame atomic absorption spectrometry;
- Part 15. Determination of cadmium content by flame atomic absorption spectrometry;

- Part 16. Determination of the amount of carbon and sulfur by high frequency combustion infrared absorption spectroscopy;
- Part 17. arsenic, antimony, bismuth contents hydride generation - atomic fluorescence spectrometry;
- Part 18. Determination of mercury content - Cold atomic absorption spectrometry;
- Part 19. Determination of energy aluminum, chromium, iron, magnesium, manganese, nickel and silicon content dispersive X-ray fluorescence spectrometry;
- Part 20. Determination of aluminum content EDTA titration;
- Part 21. Determination of chromium content ammonium ferrous sulfate titration;
- Part 22. Determination of magnesium content EDTA titration;
- Part 23. cobalt, iron, nickel, phosphorus, aluminum oxide, calcium oxide, chromium oxide, magnesium oxide, manganese oxide, silicon dioxide and titanium dioxide volume Wavelength dispersive X-ray fluorescence spectrometry;
- Part 24. Determination of hygroscopic water weight method;
- Part 25. Determination of combined water content - Gravimetric method;
- Part 26. Determination of loss on ignition - Gravimetric method.

This section YS/T 820-2012 Part 17.

This standard by the national non-ferrous metals Standardization Technical Committee (SAC/TC243) centralized.

This standard by the Beijing General Research Institute of Mining and Metallurgy, People's Republic of China Bayuquan Exit Inspection and Quarantine, Jinchuan Group Ltd, Drafted.

This section is drafted. Beijing Mining Research Institute, People's Republic of China Liaoning SAIEC IQ drafted.

Participated in the drafting of this section. Guangzhou Nonferrous Metal Research Institute, People's Republic of China, Nantong CIQ.

1 Scope

This section YS/T 820 provides for arsenic, antimony, bismuth determination of the amount of nickel laterite ore.

This section applies to arsenic, antimony, bismuth contents of nickel laterite ore. Measuring range. 0.0050% to 0.10%.

2 Method summary

Sample with nitric acid, sulfuric acid dissolution with hydrochloric acid dissolved salts.
Pre-reduction with ascorbic acid, thiourea masking interfering elements in hydride
Generator, arsenic, antimony, bismuth is reduced to potassium borohydride as hydride with
argon gas into the quartz furnace atomizer, measured on the atomic fluorescence
spectrometer Given its fluorescence intensity.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade
reagents and distilled or deionized water or equivalent purity.

Nitrate 3.1 (rho1.42g/mL).

3.2

hydrochloride (rho1.19g/mL).

3.3

sulfate (rho1.84g/mL).

3.4

nitric acid (11).

3.5

hydrochloride (11).

3.6

hydrochloride (19).

3.7

hydrochloric acid (119).

3.8

hydrochloride (149).

3.9

Potassium hydroxide solution (5g/L).

3.10

Sodium hydroxide solution (100g/L).

3.11

ammonium fluoride solution (100g/L).

3.12

thiourea - ascorbic acid solution (100g/L). Weigh thiourea, ascorbic acid dissolved in 200mL of water each 20g. Active Now equipped.

3.13

potassium borohydride solution (15g/L). Weigh 3.0g of potassium borohydride dissolved in 200mL of potassium hydroxide solution (3.9) in. Using now.

3.14

arsenic standard stock solution. Weigh 0.1320g trioxide (previously at 105 °C ± 5 °C baking 1h, placed in the dryer to cool to Room temperature) in 300mL beaker, sodium hydroxide solution was added 20mL (3.10), low-temperature heating to dissolve, add 2 drops of phenolphthalein ethanol solution (3.18) with hydrochloric acid (3.5) and to the red and then just disappear excess 2mL, cooled and transferred to 1000mL volumetric flask, dilute to the mark with water Degree, and mix. This solution 1mL containing 100µg arsenic.

3.15

Antimony standard stock solution. Weigh 0.1000g metal antimony ($w_{Sb} \geq 99.99\%$) in 300mL beaker, add 30mL of nitric acid (3.1) and 4g of tartaric acid, low heat to dissolve, and evaporated to near dryness, coolish, adding 50mL hydrochloric acid (3.5), dissolved by heating, boiling to remove nitrogen