

ICS 73.060

CCS D41



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 1819.7-2017

Replacing GB/T 1819.7-2004

**Methods for chemical analysis of tin concentrates - Part
7:Determination of bismuth content - Flame atomic absorption
spectrometric method**

锡精矿化学分析方法 第7部分：铋量的测定 火焰原子吸收光谱法

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Foreword

GB/T 1819 "tin concentrate chemical analysis method" is divided into 21 parts.

- Part 1. Determination of moisture thermal drying method;
- Part 2. Determination of tin content potassium iodate titration;
- Part 3. Determination of iron content cerium sulfate titration method;
- Part 4. Determination of lead content by flame atomic absorption spectrometry and Na₂ EDTA titration;
- Part 5. Determination of arsenic Arsenic antimony molybdenum blue spectrophotometry and iodometric titration;
- Part 6. Determination of the amount of antimony; malachite green spectrophotometry and flame atomic absorption spectrometry;
- Part 7. Determination of bismuth content by flame atomic absorption spectrometry;
- Part 8. Determination of zinc content by flame atomic absorption spectrometry;
- Part 9. Determination of the amount of tungsten trioxide; potassium thiocyanate spectrophotometry;
- Part 10. Determination of sulfur content High-frequency induction furnace combustion infrared absorption method and potassium iodate titration;
- Part 11. Determination of the amount of aluminum oxide chromium azure S spectrophotometry;
- Part 12. Determination of the amount of silica silicon molybdenum blue spectrophotometry and sodium hydroxide titration;
- Part 13. Determination of magnesia, calcium oxide content; Flame atomic absorption spectrometry;

1 Scope

GB/T 1819.7-2017 is the Chinese national standard on methods for chemical analysis of tin concentrates - part 7: determination of bismuth content - flame atomic absorption spectrometric method, in the field of mining and minerals. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 29 September 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 April 2018. Classification: ICS 73.060, CCS D41. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

GB/T 1819 provisions of this part of the tin concentrate Determination of bismuth. This section applies to the determination of bismuth in tin concentrate. Determination of the range of 0.005% ~ 2.50%.

2 Method summary

Sample with hydrochloric acid, nitric acid decomposition, hydrochloric acid - nitric acid medium, the use of air - acetylene flame, atomic absorption spectrometer wavelength 223.06nm Department, measuring the absorbance of bismuth.

3 Reagent

Unless otherwise specified, only reagents that are identified as analytically pure and secondary water are used in the analysis.

3.2 Nitric acid ($\rho =$

3.3 mixed acid hydrochloric acid nitric acid (3 1), formulated with time.

3.4 Nitric acid (1 1).

3.5 Ammonium fluoride solution (200 g/L).

3.6 bismuth standard stock solution Weigh 0.5000g bismuth metal ($w_{Bi} \geq 99.99\%$) in 250mL beaker, add 20mL nitric acid (3.4), cover the watch glass, slightly heated to dissolve completely, remove, cool to room temperature, with a small amount of water purify the watch glass and cup wall, water into the 500mL Volumetric flask, add 50mL of nitric acid (3.2), diluted with water to the mark, mix well. This solution 1 mL contains 1 mg bismuth.

3.7 bismuth standard solution Pipette 25.00mL bismuth standard stock solution (3.6) In a

250mL volumetric flask, add 25mL nitric acid (3.2), with Dilute the water to the mark and mix well. This solution 1 mL contains 100 μg of bismuth.

Atomic Absorption Spectrometer, Bismuth Hollow Cathode Lamp. In the best working conditions of the instrument, anyone who can meet the following indicators can be used.

--- Characteristic Concentration In the solution in accordance with the measurement of the solution matrix, bismuth characteristic concentration should not exceed 0.14 $\mu\text{g}/\text{mL}$.

--- Precision. With the highest concentration of standard solution measured 10 times the absorbance, the standard deviation should not exceed 1.0% of the average absorbance; Measure the absorbance 10 times with the lowest standard solution (not the "zero" standard solution), and the standard deviation should not exceed the maximum Concentration Standard solution 0.5% of the average absorbance.

--- Work curve linearity. The standard curve is divided into five equal concentrations, the highest segment of the absorbance difference and the lowest segment of the absorbance difference Than, should not be less than 0.70.

Sample size should not be greater than 0.074mm. The sample should be baked at 105 $^{\circ}\text{C} \pm 5$ $^{\circ}\text{C}$ oven 1h, and placed in a desiccator cooled to room temperature