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

SN/T 5248-2020

**Method for determination of gold content in imported
gold-loaded resin materials-flame atomic absorption
spectrometry**

进口载金树脂物料中金含量的测定方法 火焰原子吸收光谱法

(English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed and managed by the General Administration of Customs of the People's Republic of China.

Drafting organizations of this standard. Urumqi Customs of the People's Republic of China, Shanghai Tuomi Testing Technology Service Co., Ltd., Xinjiang Agriculture University College of Chemical Engineering, Beilun Customs of the People's Republic of China, Xinjiang Shuiqingqing Environmental Monitoring Technology Service Co., Ltd., Xinjiang Uyghur Autonomous Region Analysis and Testing Research Institute, Tianjin Customs of the People's Republic of China, Xinjiang University.

1 Scope

This standard specifies the atomic absorption spectrometry method for the determination of gold content in gold-loaded resin materials.

This standard applies to the determination of gold content in gold-loaded resin materials.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 602 Preparation of standard solutions for impurity determination of chemical reagents
GB/T 6682 Analytical laboratory water specifications and test methods

3 Method summary

After the sample is roasted to remove sulfur and organic matter, it is dissolved with hydrochloric acid and nitric acid, and the gold, the adsorbed gold chloride complex or the After the gold bromine complex is dissolved and liberated with thiourea, its gold content is measured with a flame atomic absorption spectrometer.

4 Reagents and materials

Unless otherwise specified, only reagents confirmed to be analytically pure are used in the analysis, and the experimental water meets the first-grade water specified in GB/T 6682.

4.1

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

4.2

Nitric acid ($\rho=1.42$ g/mL).

4.3

Thiourea.

4.4

Bromine.

4.5

Dilute hydrochloric acid (1.9).

4.6

Gold standard stock solution (1 000 $\mu\text{g/mL}$). Prepare according to GB/T 602 method or directly use certified national standard materials.

4.7

Gold standard working solution (100 $\mu\text{g/mL}$). Pipette 10 mL of gold standard stock solution (4.6) into a 100 mL volumetric flask, and use dilute hydrochloric acid (4.5) Dilute to the

mark and mix well.

4.8

Aqua regia. mix 3 parts of hydrochloric acid (4.1) and 1 part of nitric acid (4.2), and prepare when used.

4.9

Aqua regia (1.1). Mix 1 part of aqua regia (4.8) and 1 part of water, and prepare when used.

4.10

Saturated bromine water. Dissolve a certain amount of bromine (4.4) in water, partially dissolve bromine (4.4), and take the supernatant to obtain saturated bromine (4.4).

And bromine water.

4.11

Thiourea solution (10 g/L). Weigh 1 g of thiourea (4.3) and dissolve it in 100 mL of water.

4.12

Sodium hydroxide solution (10 g/L). Weigh 10 g of sodium hydroxide and dissolve it in 1 L of water.

4.13

Plastic foam. polyurethane type or polyether type, cut into blocks of 3 cmx3 cmx1 cm, rinse with water before use, Boil in sodium solution (4.12) for 15 minutes, wash with water until neutral, dry, and set aside.

5 Apparatus and equipment

5.1

Atomic absorption spectrophotometer. equipped with a gold element hollow cathode lamp.

5.2

Analytical balance. Sensitivity is 0.0001 g.

5.3

High-temperature furnace. The temperature can be controlled between 500 °C and 1 000 °C.

5.4

Electric heating plate. can be heated to.200 °C.

5.5

Oscillator.

5.6

Porcelain crucible. 30 mL.

5.7

Colorimetric tube. 25 mL.

5.8

Volumetric flask. 50 mL.

6 Sample

The particle size of the gold-loaded resin material analysis sample should be less than 0.096 mm, and it should be baked at $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for 2 h, and then cooled to room temperature in a desiccator for later use.

7.1 Sample processing

Weigh 10.0 g (accurate to 0.0001 g) of the sample and place it in a 30 mL porcelain crucible (5.6), and place it in a high-temperature furnace (5.3) at $650\text{ }^{\circ}\text{C}$ Burn for 2 h, after cooling, transfer to a 250 mL Erlenmeyer flask, add 25 mL of aqua regia (4.9), heat and boil on the electric hot plate (5.4) for 1 h, Dilute with water to 70 mL, add 3.0 mL saturated bromine water (4.10), and shake quickly. After cooling to room temperature, put in 0.2 g~0.4 g plastic bubble Foam (4.13), cover the stopper, shake on the shaker (5.5) for 30 minutes, take out the foam with a glass rod, and wash with water to remove foam the residue and acid on the plastic squeeze out the water. Put the foam plastic into a 25 mL colorimetric tube pre-filled with 15.0 mL thiourea solution (4.11) in (5.7), put it in a boiling water bath to release for 30 minutes, and take out the colorimetric tube (5.7). Move the foam plastic up to the upper part of the colorimetric tube (5.7) and squeeze it dry Then take it out, cool the solution to room temperature, dry filter, and take the clear solution for measurement.

7.2 Blank test

Do a blank test with the sample.

7.3 Production of working curve

Pipette 0 mL, 0.20 mL, 0.24 mL, 0.48 mL, 0.68 mL, 0.90 mL gold standard working solution (4.7) into 6 250 mL in the Erlenmeyer flask, follow the steps in (7.1). The concentrations of gold are $1.33\text{ }\mu\text{g/mL}$, $1.60\text{ }\mu\text{g/mL}$, $3.20\text{ }\mu\text{g/mL}$, $4.53\text{ }\mu\text{g/mL}$, $6.00\text{ }\mu\text{g/mL}$, with the concentration of gold ($\mu\text{g/mL}$) as the abscissa and the absorbance value as the ordinate, draw a standard working curve.