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

GB/T 11067.7-2024

**Methods for chemical analysis of silver - Part 7: Determination
of gold and palladium content - Inductively coupled plasma
emission spectrometry**

银化学分析方法 第7部分：金、钯量的测定 电感耦合等离子体发射光谱法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting is required. This document is part 7 of GB/T 11067 "Chemical analysis methods for silver". GB/T 11067 has published the following parts. Part

1. Determination of silver content - Silver chloride precipitation - Flame atomic absorption spectrometry; Part

1 Scope

GB/T 11067.7-2024 is the Chinese national standard on methods for chemical analysis of silver - part 7: determination of gold and palladium content - inductively coupled plasma emission spectrometry, in the field of metallurgy. 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 28 November 2024 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 June 2025. Classification: ICS 77.120.99, CCS H15. 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.

This document describes the method for the determination of gold and palladium in silver. This document is applicable to the determination of gold and palladium content in silver. The determination range is 0.000 2% to 0.050%.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 8170 Rules for rounding off values and expression and determination of limit values

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 Principle

The sample was dissolved in nitric acid, the gold was separated by filtration, the precipitate was placed in a crucible, burned in a muffle furnace, and a mixture of hydrochloric acid and nitric acid was added at a boiling temperature. The filtrate was dissolved in a water bath. The matrix silver was separated by precipitation with hydrochloric acid. The two solutions were combined and in the hydrochloric acid medium, an inductively coupled plasma atomic emission was used to precipitate the silver. The emission intensity of gold and palladium was measured by a radiometric spectrometer at the wavelength selected for each element, and the mass fraction of gold and palladium was calculated according to the standard working curve method.

5 Reagents and Materials

Unless otherwise stated, only reagents of confirmed analytical grade were used in the

analyses.

5.1 Water, in accordance with GB/T 6682, Grade 2 and above.

5.3 Nitric acid ($\rho=$

5.4 Hydrochloric acid (1 1).

5.5 Hydrochloric acid (1 4).

5.6 Hydrochloric acid (5 95).

5.7 Nitric acid (1 5).

5.8 Nitric acid (2 98).

5.9 Mixed acid A (3 volumes of hydrochloric acid and 1 volume of nitric acid, prepared and used immediately).

5.10 Mixed acid B (3 volumes of hydrochloric acid, 1 volume of nitric acid and 4 volumes of water, prepared and used immediately).

5.11 Gold standard storage solution. weigh 0.1000 g gold ($w_{Au} \geq 99.99\%$), place in a 100 mL beaker, add 20 mL of mixed acid A

6 Determination of iron content - Flame atomic absorption spectrometry; Part

7. Determination of gold and palladium content - Inductively coupled plasma optical emission spectrometry. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by China Nonferrous Metals Industry Association. This document is under the jurisdiction of the National Technical Committee on Standardization of Nonferrous Metals (SAC/TC 243). This document was drafted by: Daye Nonferrous Design and Research Institute Co., Ltd., Nanjing Product Quality Supervision and Inspection Institute (Nanjing Quality Development and Advanced Technology Application Research Institute), Beijing Dabo Nonferrous Metal Solder Co., Ltd., CSSC Huanggang Precious Metals Co., Ltd., Jiangxi Copper Co., Ltd. Co., Ltd., Zijin Mining Group Co., Ltd., Jinchuan Group Co., Ltd., Shenzhen Zhongjin Lingnan Nonferrous Metals Co., Ltd. The company's Shaoguan Smelter, Shandong Zhaojin Gold and Silver Refining Co., Ltd., China Nonferrous Guilin Mineral Geology Research Institute Co., Ltd., Guobiao (Beijing) Inspection and Certification Co., Ltd., Beijing Nonferrous Metals and Rare Earth Application Research Institute Co., Ltd., Yunnan Gold Mining Group Precious Metals Testing Co., Ltd. Co., Ltd., Guiyan Testing Technology (Yunnan) Co., Ltd., Tongling Nonferrous Metals Group Holdings Co., Ltd., Jiangsu Beikuang Metal Recycling Technology Co., Ltd. Co., Ltd., Shandong Hengbang Smelting Co., Ltd., and Yunnan Copper Co., Ltd. The main

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Silver is an important strategic resource and precious metal. In addition to being used for jewelry and currency, it is also widely used in photography, electronics, and chemistry. Industry, pharmaceutical industry and national defense industry. Most of the silver ore resources are associated silver ore, and the main associated deposits are gold, lead, zinc, copper, etc. The content of impurity elements in silver is an important factor affecting product quality and smelting value. Copper, bismuth, iron, lead, antimony, selenium, tellurium and palladium are the impurities in pure silver. GB/T 11067 aims to establish a complete, practical and applicable silver product production and The standard method of chemical composition analysis for trade needs. Limited by the length of the document, usage requirements, scope of application, and technical differences between various analytical methods Due to reasons such as independence, GB/T 11067 is planned to consist of 7 parts. Part

- 1.Determination of silver content Silver chloride precipitation flame atomic absorption spectrometry. The purpose is to establish the determination of silver content method. Part
- 2.Determination of copper content - Flame atomic absorption spectrometry. The purpose is to establish a method for the determination of copper content. Part
- 3.Determination of selenium and tellurium content Inductively coupled plasma atomic emission spectrometry. The purpose is to establish the selenium and tellurium content. Determination method. Part
- 4.Determination of antimony content Inductively coupled plasma atomic emission spectrometry. The purpose is to establish the determination of antimony content method. Part
- 5.Determination of lead and bismuth content - Flame atomic absorption spectrometry. The purpose is to establish a method for the determination of lead and bismuth content. Part
- 6.Determination of iron content - Flame atomic absorption spectrometry. The purpose is to establish a method for the determination of iron content. Part
- 7.Determination of gold and palladium content Inductively coupled plasma optical emission spectrometry. The purpose is to establish the determination of gold and palladium content method. GB/T 11067 "Chemical Analysis Methods for Silver" has been implemented for nearly 20 years. The analysis and detection methods are stipulated for the elements. With the opening of the silver market, the quality disputes involving gold and palladium elements