

ICS 77.120.99

CCS H15



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

GB/T 11066.11-2021

Methods for chemical analysis of gold - Part 11: Determination of magnesium, chromium, manganese, iron, nickel, copper, palladium, silver, tin, antimony, lead and bismuth contents - Inductively coupled plasma mass spectrometry

金化学分析方法 第11部分：镁、铬、锰、铁、镍、铜、钯、银、锡、锑、铅和铋含量的测定 电感耦合等离子体质谱法

Issued on: April 30, 2021

Implemented on: November 1, 2021

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Principle
- 5 Reagents and materials

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 of Standardization Documents" Drafting. This document is part 11 of GB/T 11066 "Gold Chemical Analysis Methods". GB/T 11066 has published the following parts.

- 1. Determination of the amount of gold by fire assay;
- 2. Determination of silver content by flame atomic absorption spectrometry;
- 3. Determination of iron content by flame atomic absorption spectrometry;
- 4. Determination of the amount of copper, lead and bismuth by flame atomic absorption spectrometry;
- 5. Determination of the amount of silver, copper, iron, lead, antimony and bismuth by atomic emission spectrometry;
- 6. Determination of the amount of magnesium, nickel, manganese and palladium by flame atomic absorption spectrometry;
- 7. Determination of the amount of silver, copper, iron, lead, antimony, bismuth, palladium, magnesium, tin, nickel, manganese and chromium by spark atomic emission spectrometry;
- 8. Determination of the amount of silver, copper, iron, lead, antimony, bismuth, palladium, magnesium, nickel, manganese and chromium ethyl acetate extraction-inductively coupled plasma Bulk atomic emission spectrometry;
- 9. Determination of the amount of arsenic and tin, hydride generation-atomic fluorescence spectrometry;
- 10. Determination of silicon content molybdenum blue spectrophotometry;
- 11. Determination of the content of magnesium, chromium, manganese, iron, nickel, copper,

palladium, silver, tin, antimony, lead and bismuth inductively coupled plasma quality Spectrum method. Please note that some of the contents of this document may involve patents. The issuing agency of this document is not responsible for identifying patents. This document was proposed by China Nonferrous Metals Industry Association. This document is under the jurisdiction of the National Non-ferrous Metals Standardization Technical Committee (SAC/TC243). Drafting organizations of this document. Beikuang Testing Technology Co., Ltd., Shandong Mengjinyuan Jewelry Co., Ltd., Non-ferrous Metal Technology and Economic Research Institute Co., Ltd., Guohe General Testing, Evaluation and Certification Co., Ltd., Daye Nonferrous Design and Research Institute Co., Ltd., Zhongbao Zhengxin Gold and Silver Jewelry Jewelry Inspection Co., Ltd., National Standard (Beijing) Inspection and Certification Co., Ltd., Agritech New Material Co., Ltd., Zijin Mining Group Co., Ltd. Company, Shenzhen Zhongjin Lingnan Nonferrous Metals Co., Ltd. Shaoguan Smelter, Jiangxi Copper Co., Ltd., Shandong Zhaojin Gold and Silver Refining Co., Ltd., Northern Copper Co., Ltd., Shandong Hengbang Smelting Co., Ltd., Changchun Gold Research Institute Co., Ltd., Nanjing Product Quality Supervision and Inspection Institute. The main drafters of this document. Feng Xianjin, Wang Zhongshan, Xiang Lei, Shi Yehong, Yang Fei, Ruan Guise, Wang Changhua, Feng Yuan, Shao Wenying, Hu Fangfei, Liu Chaofang, Qiu Qingliang, Tan Xiuli, Zeng Yanqiang, Zhang Mianhui, Yang Dingxian, Zhang Junfeng, Chen Yonghong, Gao Ruifeng, Li Jidong, Hu Junkai, Sun Fang, Li Na, Lu Chao, Long Xiuja, Zuo Hongyi, Duan Chunlan, Zhuang Yukai, Qian Ling, Luan Haiguang, Su Guangdong, Mei Xiuming, Li Aichang, Mo Shumin.

GB/T 11066-2009 "Gold Chemical Analysis Method" has been implemented for more than 10 years. With the revision of the product standard "Gold Ingot", the new The product standard GB/T 4134-2015 has already been released and will be implemented on April 1, 2016. GB/T 4134-2015 "Gold Ingot" standard The required elements have also changed. Therefore, the gold chemical analysis method GB/T 11066-2009 needs to be improved. In recent years, testing new technologies Hexin instruments have also developed rapidly, and the instruments of various gold production and processing enterprises, research units and third-party testing units have also been updated quickly. The stations are basically equipped with inductively coupled plasma mass spectrometry (ICP-MS), one of the most advanced inorganic element analysis technologies in the world. versus The formulation of accurate, fast, advanced and efficient standard analytical methods for gold production and application is urgently needed. This document is the 11th part of GB/T 11066 "Gold Chemical Analysis Methods". It uses inductively coupled plasma mass spectrometry technology to achieve gold The determination of the content of magnesium, chromium, manganese, iron, nickel, copper, palladium, silver, tin, antimony, lead, and bismuth is a new application of new technology in the chemical analysis of gold. This part is The above 10 parts are supplemented by accurate, direct and effective detection methods of trace and trace impurity elements in gold, which are traceable and can be used as The arbitration method for the detection of trace and trace amounts of magnesium, chromium, manganese, iron,

nickel, copper, palladium, silver, tin, antimony, lead, and bismuth in gold. Gold chemical analysis method Part

1 Scope

GB/T 11066.11-2021 is the Chinese national standard on methods for chemical analysis of gold - part 11: determination of magnesium, chromium, manganese, iron, nickel, copper, palladium, silver, tin, antimony, lead and bismuth contents - inductively coupled plasma mass 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 30 April 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 November 2021. 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 specifies the determination method of magnesium, chromium, manganese, iron, nickel, copper, palladium, silver, tin, antimony, lead and bismuth in gold. This document is applicable to the determination of magnesium, chromium, manganese, iron, nickel, copper, palladium, silver, tin, antimony, lead and bismuth content in gold. The measurement range is shown in Table 1. Table

1 Measurement range of each element
 element Quality score element Quality score
 element Quality score Mg 0.0001~

0.005 Ni 0.0001~

0.001 Sn 0.0001~

0.004 Cr 0.0001~

0.001 Cu 0.0001~

0.005 Sb 0.0001~

0.004 Mn 0.0001~

0.001 Pd 0.0001~

0.005 Pb 0.0001~

0.004 Fe 0.0002~

0.004 Ag 0.0001~

0.005 Bi 0.0001~0.003

2 Normative references

There are no normative references in this document.

3 Terms and definitions

There are no terms and definitions that need to be defined in this document.

4 Principle

The sample is decomposed with a mixed acid of hydrochloric acid and nitric acid. MS) The determination of the mass of each element selected is used to determine the magnesium, chromium, manganese, iron, nickel, copper, palladium, silver, Tin, antimony, lead, and bismuth content.

5 Reagents and materials

Unless otherwise specified, only reagents confirmed to be pure superior grade are used in the analysis.