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

GB/T 11066.6-2009

**Methods for chemical analysis of gold - Determination of
magnesium, nickel, manganese, palladium contents - Flame
atomic absorption spectrometry**

金化学分析方法 镁、镍、锰和钯量的测定 火焰原子吸收光谱法

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Foreword

GB/T 11066 "Methods for chemical analysis of gold" is divided into 10 parts.

--- GB/T 11066.1 gold chemical analysis method of determining the amount of gold fire assay;

--- GB/T 11066.2 gold chemical analysis of silver content - Flame atomic absorption spectrometry;

--- GB/T 11066.3 gold chemical analysis of iron content by flame atomic absorption spectrometry;

--- Flame atomic GB/T 11066.4 gold chemical analysis of copper, lead and bismuth contents absorption spectrometry;

--- GB/T 11066.5 gold chemical analysis method for determination of atomic silver, copper, iron, lead, antimony and bismuth amount of emission spectrometry;

--- GB/T 11066.6 gold chemical analysis of magnesium, nickel, manganese, and palladium contents - Flame atomic absorption spectrometry;

--- GB/T 11066.7 gold chemical analysis of silver, copper, iron, lead, antimony, bismuth, palladium, magnesium, tin, nickel, manganese and chromium contents - fire Flower atomic emission spectrometry;

--- GB/T 11066.8 gold chemical analysis of silver, copper, iron, lead, antimony, bismuth, palladium, magnesium, nickel, manganese and chromium contents - ethyl acetate Ester extraction - inductively coupled plasma atomic emission spectrometry;

--- GB/T 11066.9 gold chemical analysis method for determination of arsenic and tin hydride generation - atomic fluorescence spectrometry;

--- GB/T 11066.10 Determination of gold chemical analysis of silicon content - Molybdenum blue spectrophotometric method. This section GB/T Part of 611,066. This part is proposed by the China Nonferrous Metals Industry Association. The non-ferrous metal part by the National Standardization Technical Committee. This section is responsible for drafting unit. Chengdu Banknote Printing Company and Nonferrous Metals Industry Standards and

Metrology Institute of Chinese quality. Participated in the drafting of this section. Changchun Gold Research Institute, Shanghai Mint, Shenyang Mint, Zijin Mining Group Co., Ltd., Jiangsu West Guixi Smelter Copper Company, Daye Nonferrous Design and Research Institute Limited. The main drafters of this section. Feifei Chen, Huang Rui, Chen Yonghong, Zhao Yue, Wang Yu, Chen Jie, Zhuxiu Fen, Huang Minhua, Guo Yuzhu, Ramee show, Lan Mei E, Shen Guang Xin, Li Xiaoyu, Liu Yan. Methods for chemical analysis of gold Determination of magnesium, nickel, manganese, and the amount of palladium Flame Atomic Absorption Spectrometry

1 Scope

GB/T 11066.6-2009 is the Chinese national standard on methods for chemical analysis of gold - determination of magnesium, nickel, manganese, palladium contents - flame atomic absorption 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 15 April 2009 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 February 2010. Classification: ICS 77.040.30, 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.

GB/T 11066 provisions of this part of the gold in magnesium, nickel, manganese, determination of the amount of palladium. This section applies to gold magnesium, nickel, manganese, palladium contents. Determination of the wavelength range and are shown in Table 1. Table

1	Elements	Mg	Ni	Mn	Pd	Mass fraction /%	0.0001	0.0200	0.0001	0.0200	0.0001	0.0200
		0.0002	0.0500	Wavelength/nm	285.2	232.0	279.5	244.8				

2 Method summary

Sample with a mixed acid decomposition, in 1mol/L HCl medium, separation of gold extracted with ethyl acetate, the water phase is concentrated hydrochloric acid medium to be made Test solution, using air - acetylene flame atomic absorption spectrometry to measure the magnesium, nickel, manganese, palladium absorbance wavelength listed in Table 1.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade

reagents and distilled or deionized water or equivalent purity.

3.1 hydrochloric acid (1 + 11), pure class distinctions.

3.2 hydrochloric acid (1 + 9), pure class distinctions.

3.3 mixed acid. nitric acid and hydrochloric acid + water (1 + 3 + 3), pure class distinctions.

3.4 ethyl acetate.

3.5 lanthanum nitrate solution (100g/L).

3.6 Magnesium standard stock solution. Weigh 0.1658g advance by 780 °C 1h burning magnesium oxide (MgO mass fraction $\geq 99.99\%$), home In 250mL beaker, was added 20mL of hydrochloric acid (1 + 1), low dissolved with heating, cooled to room temperature. The solution is transferred to 1000mL volumetric flask, Dilute with water to volume, and mix. This solution 1mL containing 100 μ g magnesium.

3.7 Nickel standard stock solution. Weigh 1.0000g of nickel (mass fraction $\geq 99.95\%$) in 100mL beaker, add 20mL nitrate Acid (1 + 1), low temperature heating dissolved, evaporated to near dryness, cooling, 20mL of hydrochloric acid (1 + 1), dissolved salts heating, cooling, transferred to 1000mL Volumetric flask, dilute with water to volume, and mix. 1mL solution containing 1mg nickel.

3.8 manganese standard stock solution. Weigh 1.0000g of manganese metal (mass fraction $\geq 99.95\%$) in 100mL beaker, add 20mL nitrate Acid (1 + 1), low temperature heating dissolved, evaporated to near dryness, cooling, 20mL of hydrochloric acid (1 + 1), dissolved salts heating, cooling, transferred to 1000mL Volumetric flask, dilute with water to volume, and mix. 1mL solution containing 1mg manganese.

3.9 palladium standard stock solution. Weigh 1.0000g of palladium metal (mass fraction $\geq 99.99\%$) in 100mL beaker, add 20mL nitrate Acid (1 + 1), low temperature heating dissolved, evaporated to near dryness, cooling, 20mL of hydrochloric acid (1 + 1), dissolved salts heating, cooling, transferred to 1000mL Volumetric flask, dilute with water to volume, and mix. 1mL solution containing 1mg palladium.

3.10 magnesium, nickel, manganese, palladium mixed standard solution. Pipette 10mL magnesium are standard stock solution (3.6), 5mL standard stock solution of nickel (3.7), 5mL manganese standard stock solution (3.8), 10mL palladium standard stock solution (3.9) in 100mL volumetric flask, washed with hydrochloric acid (3.2) dilute Diluted to volume, and mix. This solution 1mL magnesium containing 10 μ g, 50 μ g of nickel, 50 μ g manganese, 100 μ g palladium.