

ICS 39.060

CCS Y 88



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

**GB/T 21198.3-2007**

---

**Determination of precious metals in precious metals jewellery alloys -- Method using ICP spectrometry -- Part 3: Palladium jewellery alloys -- Determination of palladium -- Method using a solution with yttrium as internal standard element**

贵金属合金首饰中贵金属含量的测定 ICP光谱法 第3部分：钯合金首饰 钯含量的测定 采用钇为内标

**(English Translation)**

**Issued on: November 12, 2007**

**Implemented on: July 1, 2008**

---

**Issued by: Standardization Administration of China**

## Table of Contents

Foreword

1 Scope

2 Normative references

3 PRINCIPLE OF THE METHOD

4 Reagent material

5 Instruments

### Foreword

GB/T 21198 "precious metal jewelry alloys precious metal content using ICP spectrometry" is divided into six parts.

--- Part 1. Determination of platinum content platinum jewelry alloys using yttrium as internal standard;

--- Part 2. Determination of platinum content platinum alloy jewelry using platinum all trace elements and the intensity ratio method;

--- Part 3. Determination of palladium jewelry alloys using palladium content of yttrium as internal standard;

--- Part 4. Determination of 999 per mille precious metal jewelry alloys precious metal content of subtraction;

Part --- Article 5. 999 per mille silver jewelry alloys - Determination of silver content difference of subtraction;

--- Part 6. Subtraction.

This section GB/T 21198 Part 3.

The section referring to ISO/DIS11495-2:2001 "Determination of palladium in palladium jewelry alloys for the content of yttrium as internal standard using ICP spectroscopy" Write, there are mainly ISO/DIS11495-2 the following technical differences.

--- The Normative references to international standards referenced in the file to our national standard GB 11887;

--- According to our standard requirements for the preparation of reagents specifications made provisions;

--- Since the standard is not covered microbalance, resulted in the removal of the original

5.2 "microbalance, it can be said to 0.001mg";

--- Due to the current international and domestic no standard for sample preparation, thus deleting the original text of Chapter 6 and Chapter 9 b).

For ease of use, this section also made the following editorial changes.

--- "This International Standard" be replaced by "this section";

"," --- With a decimal point instead of a comma as the decimal point, "";

--- With "mL" instead of "cm3";

--- Delete international standards foreword.

This part is proposed by the China National Light Industry Council.

This part of the National Standardization Technical Committee jewelry (SAC/TC256) centralized.

This section drafted by. National Jewelry Quality Supervision and Inspection Center.

## 1 Scope

This section GB/T 21198 specifies the determination of yttrium to palladium jewelry alloys palladium content of the internal standard method using ICP spectroscopy.

This section applies to a palladium content of 475 per mille ~ 970 per mille palladium alloy jewelry.

**NOTE:** palladium jewelry alloys may contain silver, indium, gallium, copper, cobalt, nickel, tin, ruthenium. Containing these alloying elements in the determination process generally do not cause interference.

## 2 Normative references

The following documents contain provisions which, through reference GB/T 21198 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB 11887 jewelry precious metal purity and designation of (GB 11887-2002, ISO 9202:1991, NEQ)

### 3 PRINCIPLE OF THE METHOD

Accurately weighed sample was dissolved in aqua regia and made accurate quality solution. The sample solution was prepared quantitatively solution aliquot, and the buffer Mixing the solution and the internal standard, calibration standard to measure the volume.

Application of ICP spectrometer, the sample solution of palladium (340.45nm) and yttrium (371.03nm) spectral intensity ratio diverging containing known Quality ratio of platinum and yttrium solution comparison, measuring the content of palladium.

### 4 Reagent material

Unless otherwise indicated in the analysis using only recognized as analytical grade reagents and distilled or deionized water or equivalent purity.

#### 4.1

Hydrochloride. mass fraction of 36% ~ 38%,  $\rho = 1.19\text{g/mL}$ .

#### 4.2

nitric acid. mass fraction of 65% ~ 68%,  $\rho = 1.40\text{g/mL}$ .

#### 4.3

pure palladium. content of at least 99.99%.

#### 4.4

Internal standard solution. Weigh 26.8g copper dihydrate ( $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ ) chloride, 7.3g sodium nitrate ( $\text{NaNO}_3$ ) and about 680mg Six Rivers Co-yttrium chloride ( $\text{YCl}_3 \cdot 6\text{H}_2\text{O}$ ) was dissolved in 200mL of water, water calibration to 1000mL.

### 5 Instruments

Conventional laboratory instruments and equipment following

#### 5.1

Inductively coupled plasma atomic emission spectroscopy (ICP spectrometer for short). the transmission line can be determined 340.45nm palladium and yttrium internal standard at the same time Intensity of emission lines 371.03nm.

Spectrometry results are more satisfied with the following characteristics.

- Reversible linear dispersion.  $0.5\text{nm/mm}$ ;
- Optical resolution.  $0.02\text{nm}$ ;
- High frequency power.  $1.2\text{kW}$ ;