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

YS/T 938.3-2013

**Chemical analysis methods of gold alloys and palladium alloys for
dental ceramic restoration. Part 3: Determination of silver content.
Flame atomic absorption spectrometry and potentiometric titration
(English Translation)**

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Foreword

YS/T 938 "dental gold PFM group and palladium-based alloy chemical analysis method" is divided into four parts.

--- Part 1. determination of gold by weight of sodium nitrite reduction method;

--- Part 2. Determination of the amount of palladium dimethylglyoxime gravimetric method;

--- Part 3. Determination of the amount of silver by flame atomic absorption spectrometry and potentiometric titration;

--- Part 4. Inductively coupled plasma atomic gold, platinum, palladium, copper, tin, indium, zinc, gallium, beryllium, iron, manganese, lithium amount of emitted light Spectroscopy.

This section YS/T 938 Part 3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

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1.1 Scope

This section YS/T 938 provides for dental porcelain repair method for the determination of gold, silver and base of palladium-based alloys.

This section applies to dental porcelain restoration with gold and palladium-based silver-based alloy was measured. Measurement range. 0.10 to 5.00%.

1.2 Method summary

Mixing the sample with hydrochloric acid, nitric acid dissolved. In hydrochloric acid medium volume fraction greater than 25%, the use of air - acetylene flame atomic absorption on a take-spectrometer, the absorbance was measured at selected silver optimum working conditions.

1.3 Reagents and materials

Unless otherwise specified, the reagents were analytical reagent solution preparation and analysis are secondary distilled water or equivalent purity test Room with water.

1.3.1

hydrochloric acid ($\rho = 1.19\text{g/mL}$).

1.3.2

nitric acid ($\rho = 1.42\text{g/mL}$).

1.3.3

mixed acid. hydrochloric acid (1.3.1) and nitrate (1.3.2) in a volume ratio 40:7 mixed preparation.

1.3.4

nitric acid (11).

1.3.5

hydrochloric acid (13).

1.3.6

Silver standard stock solution. Weigh 0.1000g metallic silver ($w_{\text{Ag}} \geq 99.99\%$), placed in 100mL beaker, add 10mL of nitric acid (1.3.4), heated until completely dissolved, to make drive nitrogen oxides, cooling. The solution was transferred to 100mL volumetric flask, diluted with de-ionized water to chlorine Volume, and mix. This solution 1mL containing 1000 μg silver.

1.3.7

Silver standard solution. Pipette 10.00mL silver standard stock solution (1.3.6) in 100mL flask, add 10mL of nitric acid (1.3.4), dilute with water to volume, and mix. This solution 1mL containing 100 μg silver.

1.4 Instrument

Atomic absorption spectrometer, with a silver hollow-cathode lamp.

Under optimum working conditions for those who can reach the following indicators can be used.

--- Characteristic concentration. in the solution was measured and consistent substrate solution, wherein the concentration of silver is not more than 0.01 μ g/mL.

--- Precision. standard solution with the highest concentration of 11 times the absorbance measurements, the standard deviation should not exceed the average absorbance of 1.0%;

The lowest concentration of standard solution used (instead of "zero concentration" standard solution) 11 measuring the absorbance, which shall not exceed the maximum standard deviation 0.5% concentration of the standard average absorbance.

--- Linear curve. the curve according to concentration, is divided into five sections, the difference between the absorbance of the absorbance difference between the highest and the lowest segment of the segment Ratio of not less than 0.7.

1.5 Sample

Sample (sheet) is processed into crushed particles with acetone to remove oil, washed with water, dried and mixed.