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National Standard of the People’s Republic of China

 GB/T 15072.17-2008

 Replaces GB/T 15072.17-1994

Test method of precious metal alloys

Determination of tungsten content for platinum alloys

Tungstic acid gravimetry

贵金属合金化学分析方法

铂合金中钨量的测定

三氧化钨重量法

(English Translation)

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Foreword

SAC/TC 243 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

This standard is an integrated revision of GB/T 15072-1994( *Chemical analysis methods for precious metals and their alloys*)(all parts), which is divided into 19 parts:

—GB/T 15072.1-2008 *Test methods of precious metal alloys Determination of gold content for gold, platinum and palladium alloys Potentiometric titration with ferrous sulfate*.

—GB/T 15072.2-2008 *Test methods of precious metal alloys Determination of silver content for silver alloys Potentiometric titration with sodium chloride*.

—GB/T 15072.3-2008 *Test methods of precious metal alloys Determination of platinum content for gold, platinum and palladium alloys Current titration with potassium permanganate*.

—GB/T 15072.4-2008 *Test methods of precious metal alloys Determination of palladium content for palladium and silver alloys Butanedione dioxime gravimetry*.

—GB/T 15072.5-2008 *Test methods of precious metal alloys Determination of silver content for gold and palladium alloys Potentiometric titration with potassium iodide*.

—GB/T 15072.6-2008 *Test methods of precious metal alloys Determination of iridium content for platinum and palladium alloys Potentiometric titration with ferrous sulfate*.

—GB/T 15072.7-2008 *Test methods of precious metal alloys Determination of chromium and iron contents for gold alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.8-2008 *Test methods of precious metal alloys Determination of copper content for gold, palladium and silver alloys EDTA complexometric back titration with thiourea precipitation*.

—GB/T 15072.9-2008 *Test methods of precious metal alloys Determination of indium content for gold alloys EDTA complexometric back titration*.

—GB/T 15072.10-2008 *Test methods of precious metal alloys Determination of nickel content for gold alloys EDTA complexometric back titration*.

—GB/T 15072.11-2008 *Test methods of precious metal alloys Determination of gadolinium and beryllium contents for gold alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.12-2008 *Test methods of precious metal alloys Determination of vanadium content for silver alloys Hydrogen peroxide spectrophotometry*.

—GB/T 15072.13-2008 *Test methods of precious metal alloys Determination of tin, cerium and lanthanum contents in silver alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.14-2008 *Test methods of precious metal alloys Determination of aluminium and nickel contents for silver alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.15-2008 *Test methods of precious metal alloys Determination of nickel, zinc and manganese contents for gold, silver and palladium alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.16-2008 *Test methods of precious metal alloys Determination of copper and manganese contents for gold alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.17-2008 *Test methods of precious metal alloys Determination of tungsten content for platinum alloys Tungsten trioxide gravimetry*.

—GB/T 15072.18-2008 *Test methods of precious metal alloys Determination of zirconium and gallium contents for gold alloys Inductively coupled plasma atomic emission spectrometry*.

—GB/T 15072.19-2008 *Test methods of precious metal alloys Determination of vanadium and magnesium contents for silver alloys Inductively coupled plasma atomic emission spectrometry.*

This part is the seventeenth of GB/T 15072-2008.

This part replaced GB/T 15072.17-1994（*Methods for Chemical Analysis of Precious Metals and Their Alloys Palladium alloys Determination of tungsten content*）.

The following deviations have been made with respect to the GB / T 15072.17-1994(the previous edition):

—The title of standard is changed from *Methods for Chemical Analysis of Precious Metals and Their Alloys Palladium alloys Determination of tungsten content* to *Test method of precious metal alloys Determination of tungsten content for platinum alloys Tungstic acid gravimetry*.

—This part is drafted in accordance with the rules given in the new document including compound and consistency.

—The scope of the standard is extended from PdW8,PdW8.5 of the previous edition to this standard is applicable to the determination of tungsten content for platinum alloys.

—This part is drafted in accordance with the rules given in the GB/T20001.4-2001.

This part was prepared by SAC/TC 243 Chinese Nonferrous Metal Standardization Technical Committee.

This part is explained by the national non ferrous metal Standardization Technical Committee.

The previous edition of this standard is as follow:

—GB / T 15072.17-1994.

Test method of precious metal alloys

Determination of tungsten content for platinum alloys

Tungstic acid gravimetry

1. Scope

This part specifies a method for the determination of tungsten content in platinum alloys.

This part is applicable to determination of tungsten content between 7% - 10% in PtW alloy.

1. Normative references

The following normative documents contain provisions which, through reference in this, constitute provisions of this part. For dated references, subsequent amendments (excluding corrections), or revisions, of any of these publications do not apply to this part. However parties to agreements based on this part are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

YS/T 371 *Methods for chemical analysis of precious metals alloys General rules and regulations*.

1. Method abstract

The test portion shall be dissolved with mixed acid, tungsten was precipitated into yellow tungsten trioxide. The amount of tungsten was determined by gravimetric method.

1. Reagent and material

Unless otherwise noted, reagents and utensil are in accordance with YS/T 371.

4.1 Hydrochloric acid(ρ1.19g/L).

4.2 Nitric acid(ρ1.42g/L).

4.3Mixed acid:3 unit volume hydrochloric acid mixed with 1 unit volume nitric acid(4.2),compound as needed.

4.4 Nitric acid(1+9).

4.5 Silver nitrate solution(10g/L).

4.6 Ammonium hydroxide(1+1).

1. Sample

The samples should be processed into fragments, remove oil stains with acetone, washed with water, dried and mixed well.

1. Analysis procedure

6.1 Test portion

Weigh 0.5g test portion accurate to 0.00001g.

6.2 Determination of the number

Two independent determinations should be required, and average the results.

6.3 Blank test

Blank test shall be done along with the test portion.

6.4 Determination

6.4.1 The portion should be placed in a 250mL beaker, then cover the surface dish and add 20mL~30mL of mixed acid, Heating the solution at low temperature on the electric stove. During dissolution, mixed acids can be added repeatedly until the black particles can’t be observed, that was considered completely dissolved. The solution shall be evaporated to about 10mL, then remove and cool to room temperature.

6.4.2 Adding 30mL water, The solution shall be filtered by a double layer of dense ashless filter paper in a φ5cm funnel. Washing the beaker four times with nitric acid (4.4), about 6mL each time, Scrubbing the edge of the beaker with a glass rod with rubber head, the precipitation shall be transferred into a funnel as many as possible, washing the beaker with nitric acid (4.4) and precipitate until they can’t have chloride ions (silver nitrate solution test). The precipitate and filter paper shall be transferred into the constant weight crucible. The original beaker shall be dried at low temperature, and the tungstic acid adhering of the beaker wall shall be swabbed with a small piece of ashless filter paper which has been wetted by ammonia water, it shall be repeated three times. Put the filter paper into the original crucible.

6.4.3 Drying the crucible and filter paper at low temperature, ash and burn at 850℃ for 20min. Removing and cool slightly. Place in a dryer for 60min and then weigh. The crucible and filter paper shall be burned again until they were constant weight.

7 Calculation of analysis results

The mass fraction of tungsten $ω\_{W}$ should be calculated according to formula (1), and the value is expressed as % :

 . $ω\_{W}=\frac{（m\_{1}-m\_{2}）×0.7930}{m\_{0}}×100$ -- -- -- -- -- -- -- -- -- -- -- (1)

In the formula:

$m\_{1}$ is the mass of tungsten trioxide and crucible in grams (g).

$m\_{2}$ is the mass of the crucible in grams (g).

$m\_{0}$ is the mass of portion in grams (g).

0.3161 is the conversion of tungsten trioxide to tungsten.

The results should be expressed to two decimal places.

8 Tolerance1

The difference between laboratory analysis results should not be greater than 0.10%.