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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 15072.12-2008

Replacing GB/T 15072.12-1994

Test methods for precious metal alloys - Determination of the vanadium content of silver alloys - Hydrogen peroxide spectrophotometry

贵金属合金化学分析方法 银合金中钒量的测定 过氧化氢分光光度法

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Foreword

This standard is GB/T 15072-1994 "precious metals and their alloys -" (all parts) the integration of amendments into Part 19. Determination

--- GB/T 15072.1-2008 Methods for chemical analysis of precious metal alloys of gold, platinum, palladium, gold alloy amount of ferrous sulfate Potentiometric titration;

--- GB/T 15072.2-2008 Methods for chemical analysis of precious metal alloys silver alloys Determination of silver content of sodium chloride potential drop Titration;

--- GB/T 15072.3-2008 Methods for chemical analysis of precious metal alloys of gold, platinum, palladium, platinum alloys determining the amount of potassium permanganate Current titration;

--- GB /15072.4-2008 Methods for chemical analysis of precious metal alloys of palladium, silver-palladium alloy determining the amount of T-dimethyl glyoxal Gravimetric method;

--- GB/T 15072.5-2008 Methods for chemical analysis of precious metal alloys of gold, measuring the potential of potassium iodide palladium alloy of silver content drops Titration;

--- GB/T 15072.6-2008 precious metal alloys - Determination of platinum, palladium, iridium alloy in determining the amount of ferrous sulfate Current titration;

--- GB/T 15072.7-2008 precious metal alloys - Gold alloys chromium and iron content - Inductively coupled plasma Plasma atomic emission spectrometry;

--- GB/T 15072.8-2008 precious metal alloys - gold, palladium, silver and copper alloys - Determination of the amount of precipitation thiourea EDTA complexometric back titration;

--- GB/T 15072.9-2008 precious metal alloys - Gold alloys - Determination of the amount of indium by EDTA back drop Titration;

--- GB/T 15072.10-2008 precious metal alloys - Gold alloys - Determination of nickel by EDTA back drop Titration;

--- GB/T 15072.11-2008 precious metal alloys - gold alloy of gadolinium and beryllium content - Inductively coupled plasma Plasma atomic emission spectrometry;

--- GB T 15072.12-2008 precious metal alloys - Silver alloys - Determination of vanadium content/hydrogen peroxide spectrophotometer Law degree;

--- GB/T 15072.13-2008 precious metal alloys - Tin in silver, cerium and lanthanum content - Inductively coupled Plasma atomic emission spectrometry;

1 Scope

China's national method for determining vanadium in silver alloys, by hydrogen peroxide spectrophotometry. It is Part 12 of GB/T 15072 and specifies the determination of the vanadium content of silver alloys. Silver is used industrially for two properties that nothing else matches: it is the best electrical conductor and the best thermal conductor of any metal, and its oxide is conductive rather than insulating, which is why a silver contact keeps working after the arcing that would ruin a copper one. But pure silver is soft, it welds to itself under contact pressure, and it erodes under arcing. So it is alloyed, and the additions are made in small amounts for specific effects: vanadium among them, added to refine the grain and to improve the resistance to arc erosion in electrical contact materials. Because the addition is small and its effect is disproportionate, the assay has to be reliable at a level where the element is a minor constituent in a heavy matrix. The method uses the colour that vanadium develops with hydrogen peroxide in acid solution, a classical reaction that is specific enough to be used directly and simple enough to be run without instrumentation beyond a spectrophotometer - which matters for a determination that a works laboratory has to perform routinely rather than send out. What the standard fixes is the dissolution of the alloy, the removal or masking of the silver matrix itself, which would otherwise precipitate and interfere, the acidity and the colour development conditions, the wavelength and the calibration, and the precision of the result. Issued on 31 March 2008 and in force since 1 September 2008, it replaces GB/T 15072.12-1994.

This section specifies the determination method silver vanadium content. This section applies to the determination of vanadium content in AgCuV in. Measurement range (mass fraction). 0.1% to 0.4%.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this section, however, encourage the parties to this part of the research agreement Whether the latest versions of these documents. For

undated reference documents, the latest versions apply to this section. 371 precious metal alloys - General rules and regulations YS/T

3 Method summary

Sample was dissolved in nitric acid at 2.5mol/L solution of nitric acid, vanadium (V) with hydrogen peroxide complexes formed orange, spectrophotometer Measured at a wavelength of 450nm absorbance to determine the content of the alloy of vanadium.

4 Reagents and materials

Unless otherwise noted, reagents and vessels shall comply with YS/T 371 standard. Nitrate 4.1 (rho1.42g/mL).

4.2 nitrate solution. low-temperature heating nitric acid (4.1), out of the colorless solution was diluted to NO2, cooled with an equal volume of water.

4.3 hydrogen peroxide solution (1 + 9).

4.4 V standard stock solution. Weigh 0.500g metal vanadium (vanadium content of not less than 99.99%), accurate to 0.0001g, placed 300mL beaker, add 30mL of nitric acid (4.1), cover the surface of the pan, over low heat until completely dissolved, the solution was yellow (if greenish low Pentavalent vanadium solution can be heated concentrated nitric acid was added to the yellow solution was expensive). Remove, cool down, rinse the beaker and watch glass wall, into 500mL volumetric flask, dilute to the mark with water. Mix well. 1mL solution containing 1mg vanadium.

4.5 Vanadium standard solution. Pipette 5.00mL standard stock solutions of vanadium in a 50mL volumetric flask, dilute to volume with water. Mix well. This solution 1mL solution containing 100μg vanadium. This standard reagents and water must not contain chlorine ions.

5 Instruments

Visible spectrophotometer.

6 Sample

Samples with acetone to remove oil, washed with water, dried and processed into chips, and mix.

7 Procedure

7.1 Sample Weigh 0.1g sample, accurate to 0.0001g.