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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 15072.15-2008

Replacing GB/T 15072.15-1994

Test methods for precious metal alloys - Determination of the nickel, zinc and manganese contents of gold, silver and palladium alloys - Inductively coupled plasma atomic emission spectrometry

贵金属合金化学分析方法 金、银、钯合金中镍、锌和锰量的测定 电感耦合等离子体原子发射光谱法

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Foreword

This standard is GB/T 15072-1994 "precious metals and their alloys -" (all parts) integration of amendments, minutes 19 parts. 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 nickel, zinc and manganese in gold, silver and palladium alloys by inductively coupled plasma atomic emission spectrometry. It is Part 15 of GB/T 15072 and specifies the determination of these three elements in the three precious metal matrices. Covering three matrices in one part is unusual in this series and it is deliberate: the three base elements are the common alloying additions across all the precious metals used in electrical contacts, in brazing fillers and in dentistry, and the analytical problem is the same in each case - a minor constituent in a heavy noble matrix. Nickel hardens and refines the grain and improves wetting. Zinc lowers the melting point, which is what makes a gold or silver brazing alloy usable at a workable temperature, and it also whitens gold. Manganese deoxidises, improves the fluidity of a molten filler and, in some contact alloys, forms the oxide dispersion. All three therefore appear in the specification of the alloy and all three affect whether it performs. What makes the determination demanding is the matrix rather than the analytes: gold, silver and palladium each need a different dissolution, silver precipitates with chloride, palladium forms stable complexes, and all three emit strongly across the spectrum. So the standard sets out the dissolution for each matrix, the analytical lines chosen to avoid the matrix emission, the matrix-matched calibration, the working ranges and the precision. Issued on 31 March 2008 and in force since 1 September 2008, it replaces GB/T 15072.15-1994.

This section provides the gold, silver, palladium alloy of nickel, zinc and manganese determination of the amount. This section applies to AuCuNiZn, AuCuNiZnMn, AuNiCr, PdAgCuAuPtZn, AuGeNi, AuGeNiCu and AuNiFeZr alloy nickel, zinc and manganese determination. Measurement range (mass fraction). Ni and Zn0.5% ~ 6%, Mn0.01% ~ 0.5%.

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. 371-2006 precious metal alloys - General rules and regulations YS/T

3 Method summary

Samples with hydrochloric acid - nitric acid mixture is dissolved in hydrochloric acid and precipitation of silver, hydrazine separation of gold, platinum, palladium, copper and some added yttrium as internal Standard, inductively coupled plasma atomic emission spectrometry (hereinafter referred to as ICP-AES) was measured, calculated nickel, zinc and manganese content.

4 Reagents and materials

Unless otherwise indicated, this part of the reagents and materials shall comply with the provisions of YS/T 371's.

4.1 Argon ((Ar) >=99.95%).

4.2 hydrochloride (rho1.19g/mL). Nitrate 4.3 (rho1.42g/mL).

4.4 hydrochloric acid - nitric acid mixture (3 + 1), when using the existing service. Hydrochloride 4.5 (1 + 9).

4.6 hydrazine ($N_2H_4 \cdot H_2O$, contain not less than 80%).

4.7 Nickel stock standard solution. Weigh 0.1000g of nickel ((Ni) >=99.99%), placed in 200mL beaker. Added 10mL Mixed acid (4.4), cover the surface of the dish. Low heat to dissolve completely. Cooled to room temperature, moved with hydrochloric acid (4.5) 100mL volumetric flask and Dilute to the mark. Mix well. 1mL solution containing 1mg nickel.

4.8 standard zinc stock solution. Weigh 0.1000g metal zinc ((Zn) >=99.99%), placed in 200mL beaker. Added 10mL Hydrochloric acid (4.5), cover the surface of the pan, over low heat until dissolved completely. Cooled to room temperature, moved with hydrochloric acid (4.5) 100mL volumetric flask and dilute Explanation to the mark. Mix well. 1mL solution containing 1mg zinc.

4.9 Mn stock standard solution. Weigh 0.1000g of manganese metal ((Mn) >=99.99%), placed in 200mL beaker. Join 5mL 5mL of water and nitric acid (4.3), cover the surface of the pan, over low heat until dissolved completely, boil drive to make nitrogen oxides. Cooled to room temperature, washed with hydrochloric acid (4.5) transferred to 100mL volumetric flask and dilute to volume. Mix well. 1mL solution containing 1mg manganese.

4.10 yttrium stock standard solution. Accurately weigh 0.1270g yttria ((Y_2O_3) >=99.99%), placed in 200mL beaker. Added 10mL of hydrochloric acid (4.5), cover the surface of the pan, over low heat until dissolved completely. Cooled to room temperature and transferred to 100mL container with hydrochloric acid (4.5) Volumetric flask and dilute to the mark. Mix well. 1mL solution containing 1mg yttrium.