ICS 77.120.99
CCS H 68

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 15072.7-2008

Replacing GB/T 15072.7-1994

Test methods for precious metal alloys - Determination of the chromium and iron contents of gold alloys - Inductively coupled plasma atomic emission spectrometry

贵金属合金化学分析方法 金合金中铬和铁量的测定 电感耦合等离子体原子发射光谱法

Issued on: March 31, 2008 **Implemented on: September 1, 2008**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;
Standardization Administration of the PRC

Table of Contents

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 chromium and iron in gold alloys by inductively coupled plasma atomic emission spectrometry. It is Part 7 of GB/T 15072 and specifies the determination of chromium and iron in gold alloys, applying to gold-nickel-chromium, gold-iron-chromium and gold-nickel-iron-zirconium alloys over a mass fraction range of 0.5 to 7 per cent. These are not jewellery alloys. Gold with small additions of chromium, iron, nickel and zirconium is a resistance and thermocouple material: gold-chromium is used for precision resistors and strain gauges because its resistivity varies very little with temperature, and gold-iron is the standard thermocouple leg for cryogenic thermometry, where it retains a usable thermoelectric sensitivity down to a few kelvin, at temperatures where the ordinary base metal thermocouples have essentially none. In both cases the property that makes the alloy worth its cost depends directly on the concentration of the addition: a fraction of a per cent of iron changes the thermoelectric power of a gold-iron thermocouple measurably, and the calibration of the sensor depends on the alloy having been made to specification. So the assay is not a check on purity but a determination of the working property by proxy, over a range where the elements are minor but not trace. The standard sets the dissolution of gold, the analytical lines for chromium and iron against a gold matrix, 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 15072.7-1994.

This section provides the determination of gold alloy of chromium and iron content. This section applies to AuNiCr, measured AuFeCr and AuNiFeZr alloy of chromium and iron content. Measurement range (mass fraction). 0.5% to 7%.

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

Samples with hydrochloric acid - nitric acid mixture dissolved sulfite reduction and separation of gold, yttrium is added as an internal standard by inductively coupled plasma atomic emission spectrometry Act (hereinafter referred to as ICP-AES) was measured to calculate the mass fraction of iron and chromium.

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) >=99.99%).

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 sulfite (to SO2, at a level of not less than 6%).

4.7 Chromium stock standard solution. Accurately weigh 0.1000g chromium ((Cr) >=99.99%), placed in 200mL beaker. Join 5mL hydrochloric acid (4.2) and 2mL nitric acid (4.3), cover the surface of the pan, over low heat until dissolved completely. Transferred to 100mL container with hydrochloric acid (4.5) Volumetric flask and dilute to the mark. Mix well. This solution 1mL 1mg containing chromium.

4.8 iron stock standard solution. Accurately weigh 0.1000g metallic iron ((Fe) >=99.99%), placed in 200mL beaker. Join 10mL mixed acid (4.4), cover the surface of the pan, over low heat until dissolved completely evaporated to about 5mL. Transferred to 100mL container with hydrochloric acid (4.5) Volumetric flask and dilute to the mark. Shake well. 1mL solution containing 1mg iron.

4.9 yttrium internal standard solution. Weigh 0.1270g yttria ((Y2O3) >=99.99%), placed in 200mL beaker. Join 5mL 5mL water and hydrochloric acid (4.2), cover the surface of the pan, over low heat until dissolved completely. Cooling to room temperature, transferred to 100mL capacity with hydrochloric acid (4.5) Flask and dilute to the mark. Mix well. 1mL solution containing 1mg yttrium.

5 Instruments

ICP-AES instrument. Under optimum working conditions for those who can reach the following indicators can be used.