ICS 77.120.99
CCS H 68

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 15072.13-2008

Replacing GB/T 15072.13-1994

Test methods for precious metal alloys - Determination of the tin, cerium and lanthanum contents of silver alloys - Inductively coupled plasma atomic emission spectrometry

贵金属合金化学分析方法 银合金中锡、铈和镧量的测定 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

1 Scope

China's national method for determining tin, cerium and lanthanum in silver alloys by inductively coupled plasma atomic emission spectrometry. It is Part 13 of GB/T 15072 and specifies the determination of these three elements in silver alloys. The three are grouped in one method because they are added for the same purpose. Silver electrical contacts fail by welding and by arc erosion, and the classical remedy was silver-cadmium oxide, in which dispersed oxide particles keep the contact from welding and take the heat of the arc. Cadmium is toxic and has been progressively eliminated, and the replacements are silver alloys containing tin oxide, usually with rare earth additions - cerium and lanthanum among them - which improve the wetting between the oxide particles and the silver matrix and control how the oxide forms during internal oxidation. The performance of the finished contact depends on how much of each is present, so the assay is a specification test rather than an academic one. ICP emission is the right technique because it measures all three simultaneously from one solution against a matrix-matched calibration, and because it handles a silver matrix, which is difficult for most other methods: silver precipitates as the chloride in the presence of any chloride ion, and its emission lines are numerous. The standard therefore fixes the dissolution, the treatment of the silver matrix, the analytical lines and their interferences, the matrix matching of the standards, the working ranges and the precision. Issued on 31 March 2008 and in force since 1 September 2008, it replaces GB/T 15072.13-1994.

This section specifies the determination method of Tin silver, cerium and lanthanum content. This section applies to AgCe, AgSnCeLa, AgCuSnCe, AgCuNiCe of Tin, cerium and lanthanum measured quantity. Measurement range (Mass fraction). 0.2% to 2%.

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 dissolved in nitric acid (sulfuric acid was added to the tin-containing sample to prevent hydrolysis), hydrochloric acid precipitation of silver by inductively coupled plasma atomic Emission spectrometer (hereinafter referred to as ICP-AES) was measured, calculated cerium, lanthanum, tin 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 (>=99.95%). Nitrate 4.2 (rho1.42g/mL).

4.3 hydrochloride (rho1.19g/mL).

4.4 sulfate (rho1.84g/mL).

4.5 Hydrogen peroxide (content. 30%).

4.6 Nitric acid. get rid of low-temperature heating NO2, form 1 + 1 solution. Hydrochloride 4.7 (1 + 9).

4.8 cerium stock standard solution. Weigh 0.1228g ceria ((CeO2) >=99.95%), placed in 200mL beaker. Join 10mL of nitric acid (4.6) was added, 3mL hydrogen peroxide (4.5), low-temperature heating to dissolve completely, covered with a watch glass and thereafter repeatedly hydrogen peroxide was added dropwise (4.5) until completely dissolved ceria. Cooled to room temperature, moved with hydrochloric acid (4.7) 100mL volumetric flask and dilute to volume. Mix well. 1mL solution containing 1mg cerium.

4.9 Lanthanum stock standard solution. Weigh 0.1173g lanthanum oxide ((La2O3) >=99.95%), placed in 200mL beaker. Join 10mL hydrochloric acid (4.7), cover the surface of the pan, over low heat until dissolved completely. Cooled to room temperature and transferred to 100mL volumetric flask with hydrochloric acid (4.7) And diluted to the mark. Mix well. 1mL solution containing 1mg lanthanum.

4.10 tin stock standard solution. Weigh 0.1000g metal tin (>=99.95%), placed in 200mL

beaker. Hydrochloric acid was added 10mL (4.7), cover the surface of the pan, over low heat until dissolved completely. Cooled to room temperature, moved with hydrochloric acid (4.7) 100mL volumetric flask and dilute to Scale. Mix well. 1mL solution containing 1mg tin.

19 Sections. 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/T 15072.4-2008 Methods for chemical analysis of precious metal alloys of palladium, palladium-silver alloy measured amount of dimethylglyoxime Oxime 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;

--- GB/T 15072.14-2008 precious metal alloys - silver alloy of aluminum and nickel content - Inductively coupled plasma Plasma atomic emission spectrometry;