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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 15072.14-2008

Replacing GB/T 15072.14-1994

**Test methods for precious metal alloys - Determination of the
aluminium and nickel contents of silver alloys - Inductively
coupled plasma atomic emission spectrometry**

贵金属合金化学分析方法 银合金中铝和镍量的测定 电感耦合等离子体原子发射
光谱法

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Quarantine;
Standardization Administration of the PRC**

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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 aluminium and nickel in silver alloys by inductively coupled plasma atomic emission spectrometry. It is Part 14 of GB/T 15072 and specifies the determination of these two elements in silver alloys. Aluminium and nickel appear in silver alloys for different reasons and both have to be controlled. Nickel is a hardener and a grain refiner, added to silver contact and brazing alloys to raise the strength and to slow the grain growth that would otherwise occur during the annealing and the service heating; it also improves the wetting of a silver brazing filler on steel and on nickel alloys, which is why silver brazing alloys for those substrates contain it. Aluminium is present as an internal-oxidation former in some contact materials, where a dispersed alumina phase is produced within the silver by oxidising the alloy after forming, and it is a residual element to be limited in others, since even a small amount changes the melting behaviour and the surface oxide of a brazing alloy. Determining them together makes sense because both are minor constituents in a heavy silver matrix and both are readily measured by emission. The standard fixes the dissolution and the handling of the silver, the analytical lines and the interferences, the matrix-matched calibration, the working ranges for each element and the precision. Issued on 31 March 2008 and in force since 1 September 2008, it replaces GB/T 15072.14-1994.

This section provides the determination of silver alloy of aluminum and nickel content. This section applies to AgCuNiAl, AgCuNiCe, AgCuNi AgMgNi and aluminum alloys and nickel content determination. Measuring range (quality Volume fraction). 0.1% to 2.5%.

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 precious metal alloys - General rules and regulations YS/T

3 Method summary

Sample dissolved in nitric acid, hydrochloric acid precipitates into silver after silver chloride was separated by filtration, inductively coupled plasma atomic emission spectrometry (hereinafter Acronym ICP-AES) was measured, calculated mass fraction of aluminum and nickel.

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) $\geq 99.95\%$).

4.2 hydrochloride (rho1.19g/mL). Nitrate 4.3 (rho1.42g/mL). Hydrochloride 4.4 (1 + 9). Hydrochloride 4.5 (1 + 4).

4.6 Aluminum stock standard solution. Weigh 0.1000g of aluminum ((Al) $\geq 99.99\%$), placed in 200mL beaker, add 5mL water And 5mL hydrochloric acid (4.2), 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 (4.5) And diluted to volume, and mix. 1mL solution containing 1mg aluminum.

4.7 Nickel stock standard solution. Weigh 0.1000g of nickel ((Ni) $\geq 99.99\%$), placed in 200mL beaker, add 5mL salt Acid (4.2), cover the surface of the pan, over low heat until dissolved completely. Cooled to room temperature, moved with hydrochloric acid (4.4) 100mL volumetric flask and diluted To the mark. 1mL solution containing 1mg nickel.

5 Instruments

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

5.1 source. argon plasma light source, the generator is not less than the maximum output power of 1.3kW.

5.2 Resolution. Optical resolution of about 200nm is not more than 0.010nm; optical resolution is not more than about 400nm 0.020nm.

5.3 Instrument stability. stability within the instrument 1h (RSD) less than 2.0%.

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;