INTERNATIONAL STANDARD

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Determination of platinum in platinum jewellery alloys — Gravimetric determination by reduction with mercury(I) chloride

Dosage du platine dans les alliages de platine pour la bijouterie-joaillerie — Dosage gravimétrique par réduction au chlorure de mercure(I)

Reference number
ISO 11489:1995(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11489 was prepared by Technical Committee ISO/TC 174, *Jewellery*.

Annex A of this International Standard is for information only.

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Determination of platinum in platinum jewellery alloys — Gravimetric determination by reduction with mercury(I) chloride

1 Scope

This International Standard specifies a gravimetric method for the determination of platinum in platinum jewellery alloys, preferably within the range of fineness stated in ISO 9202.

The procedure applies specifically to platinum alloys incorporating palladium, iridium, rhodium, copper, cobalt, gold, ruthenium, gallium, chromium, indium and less than 5 % tungsten. Some modifications are indicated where palladium, iridium, rhodium, gold or ruthenium are present.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9202:1991, *Jewellery — Fineness of precious metal alloys.*

3 Principle

The sample is dissolved in *aqua regia*. After elimination of all nitrates by evaporation, the residue is dissolved in hydrochloric acid. The platinum is then precipitated from this solution by reduction with mercury(I) chloride. The mercury is eliminated by ignition and the platinum is weighed. If present, gold and palladium will also be precipitated by this reduction procedure. Their content shall be determined separately by, for example, atomic absorption or inductively coupled plasma (ICP) emission spectrometry, and a correction applied.

4 Reagents

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

4.1 Hydrochloric acid, 36 % (*m/m*) to 38 % (*m/m*), $\rho_{20} = 1{,}19$ g/cm^3.

4.2 Dilute hydrochloric acid, 18 % (*m/m*), $\rho_{20} = 1{,}09$ g/cm^3.

4.3 Dilute hydrochloric acid, 8,5 % (*m/m*), $\rho_{20} = 1{,}04$ g/cm^3.

4.4 Nitric acid, 69 % (*m/m*), $\rho_{20} = 1{,}41$ g/cm^3.

4.5 Mercury(I) chloride (Hg_2Cl_2), in suspension.

Dissolve 200 g of mercury(I) nitrate dihydrate [$Hg_2(NO_3)_2{\cdot}2H_2O$] in 300 ml of water in a beaker and add approximately 50 ml of nitric acid; just sufficient to ensure that the basic mercury(I) nitrate is redissolved. Dilute the solution with water to 4 litres and add 400 ml of cold saturated ammonium chloride solution. Allow the precipitate of mercury(I) chloride to settle, decant and wash about 20 times to ensure that it is nitrate free. Add 2 litres of water and store in a closed flask.

NOTE 1 This suspension is stable and can be used even after storage for a few months.