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Jewellery and precious metals — Determination of platinum in platinum alloys — ICP-OES method using an internal standard element

Joaillerie et métaux précieux — Dosage du platine dans les alliages de platine — Méthode par ICP-OES utilisant un étalon interne

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 174, *Jewellery and precious metals*.

This third edition cancels and replaces the second edition (ISO 11494:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

a) the definition of bracketing in Clause 3 has been removed;

b) the recommended lines in Clause 4 have been removed;

c) reagents in Clause 5 have been changed and removed, and the requirements about yttrium in 5.4 have been changed;

d) the preparation of the internal standard solution in 8.1 has been changed;

e) the list of standards to be prepared and precisions about qualification of them by linearity as well as way to choose the low and high standards in 8.2 have been changed;

f) the way of preparation by aliquots for both standard and sample solutions in 8.2 and 8.3 has been removed;

g) the preparation of both standard and sample solutions in 8.2 and 8.3 has been changed;

h) precisions about quantity of acids to be used in case of dissolution under pressure in 8.4 have been added;

i) the definition of bracketing and recommended lines in 8.5 have been added;

j) the formulae in 9.1 after having removed the way of preparation by aliquots have been adapted;

k) the emission line as an information to be mentioned in the test report in Clause 10 has been removed;

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l) the document has been editorially revised.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Jewellery and precious metals — Determination of platinum in platinum alloys — ICP-OES method using an internal standard element

1 Scope

This document describes an analytical procedure for the determination of platinum in platinum alloys with a nominal content up to 990 ‰ (parts per thousand), including alloys according to ISO 9202.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

At least two accurately weighed samples are dissolved in aqua regia and made up to an exactly weighed mass. These sample solutions are mixed with the internal standard and made up to the standard measuring volume.

Using ICP-OES, the platinum content of the sample solution is measured by comparison of the ratio intensities of the spectral emission of platinum and appropriate internal standard (e. g. yttrium) line(s) with the ratios for solutions containing known masses of platinum and internal standard (e. g. yttrium) using the bracketing method.

Minor modifications are required when the alloy contains ruthenium, rhodium, iridium, or tungsten.

5 Reagents

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

5.1 Hydrochloric acid (HCl), approximately 30 % to 37 % HCl (mass fraction).

5.2 Nitric acid (HNO_3), approximately 65 % to 70 % HNO_3 (mass fraction).

5.3 Platinum (Pt) of 999,9 ‰ minimum purity; if a lower platinum content (e.g. 999,5 ‰) is used, appropriate corrections shall be applied.

5.4 Yttrium compound, like yttrium chloride ($YCl_3 \cdot 6H_2O$ or Y_2O_6), of analytical grade.

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