

INTERNATIONAL STANDARD

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Nickel alloys — Determination of titanium content — Diantipyrylmethane molecular absorption spectrometric method

*Alliages de nickel — Dosage du titane — Méthode par spectrométrie
d'absorption moléculaire au diantipyrylméthane*



Reference number
ISO 11433:1993(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 11433 was prepared by Technical Committee ISO/TC 155, *Nickel and nickel alloys*, Sub-Committee SC 4, *Analysis of nickel alloys*.

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Nickel alloys — Determination of titanium content — Diantipyrylmethane molecular absorption spectrometric method

1 Scope

This International Standard specifies a molecular absorption spectrometric method for the determination of titanium in the range of 0,3 % (m/m) to 5,0 % (m/m) in nickel alloys. Evidence exists that extension of this method is possible for titanium contents down to 0,05 % (m/m).

Modifications in the general method allow the determination of titanium in alloys containing tungsten and/or tantalum.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 385-1:1984, *Laboratory glassware — Burettes — Part 1: General requirements*.

ISO 648:1977, *Laboratory glassware — One-mark pipettes*.

ISO 1042:1983, *Laboratory glassware — One-mark volumetric flasks*.

ISO 5725:1986, *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests*.

3 Principle

Dissolution of a test portion in hydrochloric and nitric acids. Removal of hydrochloric acid and nitric acid by evaporation to fumes in the presence of sulfuric acid.

Formation of the titanium diantipyrylmethane complex and measurement of the absorbance of the test solution at a wavelength of 390 nm.

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, $\rho_{20} = 1,18$ g/ml.

4.2 Hydrochloric acid, $\rho_{20} = 1,18$ g/ml, diluted 1 + 1.

4.3 Sulfuric acid, $\rho_{20} = 1,84$ g/ml, diluted 1 + 1.

Slowly, and with constant stirring, add 100 ml of sulfuric acid to 100 ml of water.

4.4 Nitric acid, $\rho_{20} = 1,41$ g/ml.

4.5 Ammonium hydroxide, solution
 $\rho_{20} = 0,88$ g/ml.

4.6 Potassium hydrogen sulfate (KHSO₄).

4.7 Ascorbic acid, solution.

Dissolve 20 g of ascorbic acid (C₆H₈O₆) in water, dilute to 200 ml and mix.

4.8 Oxalic acid, solution.

Dissolve 10 g of oxalic acid dihydrate [(COOH)₂·2H₂O] in water, dilute to 200 ml and mix.