INTERNATIONAL STANDARD

ISO 11433

Second edition
2020-11

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

Alliages de nickel — Détermination de la teneur en titane — Méthode par spectrophotométrie d'absorption moléculaire au diantipyrylméthane

Reference number
ISO 11433:2020(E)

© ISO 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **1**
5 Reagents **2**
6 Apparatus **3**
7 Sampling **3**
8 Procedure **3**
8.1 Test portion 3
8.2 Blank test 3
8.3 Determination 4
8.3.1 Dissolution of the test portion 4
8.3.2 Preparation of the final test solution 4
8.3.3 Dilutions 4
8.4 Colour development 4
8.5 Spectrophotometric measurement 5
8.6 Establishment of the calibration curve 5
8.7 Check test 5
9 Expression of results **5**
9.1 Method of calculation 5
9.2 Precision 6
9.2.1 Laboratory tests 6
9.2.2 Statistical evaluation 6
10 Test report **6**
Bibliography **8**

© ISO 2020 – All rights reserved

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 155, *Nickel and nickel alloys*.

This second edition cancels and replaces the first edition (ISO 11433:1993), which has been technically revised in order to incorporate the Amendment ISO 11433:1993/Amd 1:2013.

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.

© ISO 2020 – All rights reserved

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

1 Scope

This document specifies a molecular absorption spectrophotometric method for the determination of titanium content in nickel alloys.

The method is applicable to titanium contents between 0,3 % (mass fraction) and 5,0 % (mass fraction).

Molybdenum, if present in the alloy, can cause a high bias in the reported titanium value to the extent of 0,001 % Ti for every 1,0 % Mo.

NOTE 1 Evidence exists that extension of this method is possible for titanium contents down to 0,05 % (mass fraction).

NOTE 2 Modifications in the general method allow the determination of titanium in alloys containing tungsten and/or tantalum.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 648, *Laboratory glassware — Single-volume pipettes*

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

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

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

Dissolution of a test portion with hydrochloric and nitric acids.

Elimination of hydrochloric and nitric acids by evaporation to fumes in the presence of sulphuric acid.

Formation of a yellow complex with diantipyrylmethane.

Spectrophotometric measurement of the absorption of the coloured complex at a wavelength of about 390 nm.

© ISO 2020 – All rights reserved