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Nickel alloys — Determination of tantalum — Inductively coupled plasma optical emission spectrometric method

Alliages de nickel — Détermination du tantale — Méthode par spectrométrie d'émission optique avec source à plasma induit par haute fréquence

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Foreword

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This document was prepared by Technical Committee ISO/TC 155, *Nickel and nickel alloys*.

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1 Scope

This document specifies an inductively coupled plasma optical emission spectrometric method for the determination of tantalum contents between 0,1 % and 5 % in nickel alloys.

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 in a mixture of hydrofluoric, hydrochloric, nitric and phosphoric acid and fuming after addition of perchloric acid. Addition of hydrofluoric acid and, if desired, of an internal reference element and dilution of the solution to known volume. Nebulization of the solution into an inductively coupled plasma optical emission spectrometer and measurement of the intensity of the emitted light from tantalum, and, where appropriate, from the internal reference element, simultaneously.

An example of the wavelength for tantalum is given in Table 1.

The method uses a calibration based on a very close matrix-matching of the calibration solutions to the sample and bracketing between 0,75 and 1,25 of the approximate content of tantalum in the sample to be analysed. The content of all elements in the sample has, therefore, to be approximately known. If the contents are not known, the sample has to be analysed by some semi-quantitative method. The advantage of this procedure is that all possible interferences from the matrix will be compensated, which will result in high accuracy. This is most important for spectral interferences, which can be severe in very highly alloyed matrixes. All possible interferences shall be kept at a minimum level. Therefore, it is essential that the spectrometer used meets the performance criteria specified in the method for the selected wavelengths.

The line corresponding to 240,06 nm has been investigated. If other lines are used, they shall be carefully checked. The wavelength for the internal reference element should be selected carefully. The

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