BS EN ISO 4938:2016

BSI Standards Publication

Steel and iron — Determination of nickel content — Gravimetric or titrimetric method

This British Standard is the UK implementation of EN ISO 4938:2016. It supersedes BS 6200-3.20.1:1989 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/102, Methods of Chemical Analysis for Iron and Steel.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Aciers et fontes - Détermination du nickel - Méthode gravimétrique ou titrimétrique (ISO 4938:2016)

Stahl und Eisen - Bestimmung des Nickelanteils - Gravimetrisches oder titrimetrisches Verfahren (ISO 4938:2016)

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European foreword

This document (EN ISO 4938:2016) has been prepared by Technical Committee ISO/TC 17 “Steel” in collaboration with Technical Committee ECISS/TC 102 “Methods of chemical analysis for iron and steel” the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 4938:2016 has been approved by CEN as EN ISO 4938:2016 without any modification.

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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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 1, *Methods of determination of chemical composition*.

This second edition cancels and replaces the first edition (ISO 4938:1988), which has been technically revised.

Steel and iron — Determination of nickel content — Gravimetric or titrimetric method

1 Scope

This International Standard specifies a method for the determination of nickel in steel and iron by gravimetry or titrimetry.

The method is applicable to nickel contents from 1 % to 30 % (mass fraction).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

ISO 4793, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation*

ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

3 Principle

Dissolution of a test portion with appropriate acids.

Precipitation of the nickel as nickel-dimethylglyoxime.

— Cobalt, if present, is oxidized by potassium hexacyanoferrate(lll).

— Copper, if present with cobalt, preferably is removed by controlled potential electrolysis.

Acid dissolution of the precipitate and filtration of the solution, followed by a second precipitation of the nickel as nickel dimethylglyoxime.

In the case of the gravimetric determination, weighing the dried dimethylglyoxime precipitate.

In the case of the titrimetric determination, acid dissolution of the precipitate, addition of excess EDTA.Na_2 solution and back titration of the excess EDTA.Na_2 by zinc solution using xylenol orange as an indicator.

In both cases, determination of residual nickel in the filtrate(s) by atomic absorption spectrometry (see Annex C).

4 Reagents

During the analysis, unless otherwise specified, use only reagents of recognized analytical grade and only distilled grade 2 water as specified in ISO 3696 or water of equivalent purity.

4.1 Sodium hydrogen sulphate ($NaHSO_4$).