International Standard

ISO 15192

Soil and waste — Determination of chromium(VI) in solid material by alkaline digestion and ion chromatography with spectrophotometric detection

Déchets et sols — Dosage du chrome(VI) dans les matériaux solides par digestion alcaline et chromatographie ionique avec détection spectrophotométrique

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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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This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical and physical characterization*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 444, *Environmental characterization of solid matrices*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 15192:2021), which has been technically revised.

The main changes are as follows:

— integration of the determination of the total chromium in the alkaline digestion solution;

— addition of barium chromate as an alternative to lead chromate for the verification of the method in 10.5.3;

— the text has been editorially revised, including updating of references.

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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Introduction

Under environmental conditions chromium in compounds exists in the trivalent, Cr(III), or the hexavalent, Cr(VI) state. Chromium is an essential trace element for mammals, including man, whereas it is presumed that Cr(VI) compounds are genotoxic and carcinogenic in humans. Interconversion of trivalent and hexavalent chromium species can occur during sample preparation and analysis, but these processes are minimised, to the extent possible, by the sample preparation methods prescribed by this document.

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Soil and waste — Determination of chromium(VI) in solid material by alkaline digestion and ion chromatography with spectrophotometric detection

1 Scope

This document specifies the determination of Cr(VI) in solid waste material and soil by alkaline digestion and ion chromatography with spectrophotometric detection. This method is applicable to determine Cr(VI) mass fractions in solids more than 0,1 mg/kg.

NOTE In case of reducing or oxidising waste matrix no valid Cr(VI) content can be reported.

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 8466-1, *Water quality — Calibration and evaluation of analytical methods — Part 1: Linear calibration function*

ISO 11464, *Soil quality — Pretreatment of samples for physico-chemical analysis*

ISO 11465, *Sludge and solid environmental matrices — Determination of dry residue or water content and calculation of the dry matter fraction on a mass basis*

EN 15002, *Characterization of waste — Preparation of test portions from the laboratory sample*

EN 15934, *Sludge, treated biowaste, soil and waste — Calculation of dry matter fraction after determination of dry residue or water content*

EN 16179, *Sludge, treated bio waste and soil — Guidance for sample pretreatment*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 Safety remarks

Anyone dealing with waste and soil analysis shall be aware of the typical risks of the material irrespective of the parameters determined. Waste and soil samples can contain hazardous (e.g. toxic, reactive, flammable, infectious) substances, which can be liable to biological and/or chemical reaction. Consequently, these samples should be handled with special care. The gases which can be produced by microbiological or chemical activity are potentially flammable and can pressurise sealed bottles. Bursting bottles are likely to result in hazardous shrapnel, dust and/or aerosol. It is presupposed that national regulations are followed with respect to all hazards associated with this method.

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