Environmental solid matrices - Determination of halogens and sulfur by oxidative pyrohydrolytic combustion followed by ion chromatography

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NATIONAL FOREWORD

See Eesti standard EVS-EN 17813:2023 sisaldab Euroopa standardi EN 17813:2023 ingliskeelset teksti.	This Estonian standard EVS-EN 17813:2023 consists of the English text of the European standard EN 17813:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 25.10.2023.	Date of Availability of the European standard is 25.10.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 71.040.40, 71.040.50

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English Version

Environmental solid matrices - Determination of halogens and sulfur by oxidative pyrohydrolytic combustion followed by ion chromatography

Matrices environnementales solides - Méthode de dosage des halogènes et du soufre par combustion pyrohydrolytique oxydative suivie d'une analyse par chromatographie ionique

Feststoffe in der Umwelt - Bestimmung von Halogenen und Schwefel durch oxidative pyrohydrolytische Verbrennung, gefolgt von Ionenchromatographie

This European Standard was approved by CEN on 23 July 2023.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 17813:2023) has been prepared by Technical Committee CEN/TC 444 “Environmental characterization of solid matrices”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

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

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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1 Scope

This document specifies an empirical method for the simultaneous direct determination of the fluorine, chlorine, bromine, and sulfur content in environmental solid matrices by oxidative pyrohydrolytic combustion at (1 050 ± 50) °C, followed by ion chromatography. The method is applicable for the determination of concentrations ≥ 10 mg/kg of each element based on dry matter. The upper limit and exact concentration range covered depends on the blank levels of the instrumentation and the capacity of the chromatographic separation column used for determination.

NOTE 1 Simultaneous determination of iodine content is possible but currently not validated.

NOTE 2 Other detection methods can be applied if validated.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
pyrohydrolysis
high temperature chemical reaction with water

3.2
test portion
analytical portion
quantity of material, of proper size, for measurement of the concentration or other property of interest, removed from the test sample

Note to entry 1: The test portion can be taken from the primary sample or from the laboratory sample directly if no preparation of sample is required (e.g. with liquids), but it is usually taken from the prepared test sample.

Note to entry 2: A unit or increment of proper homogeneity, size, and fineness, needing to further preparation, can be a test portion.

[SOURCE: EN ISO 11074:2015, definition 4.3.15]

4 Principle

The homogenized sample is combusted under oxidative conditions. For the determination of fluorine, the combustion is performed under pyrohydrolytic conditions. The combustion gases are absorbed in an aqueous solution. For the determination of sulfur the absorption solution contains an oxidizing agent to ensure complete conversion to sulfate. Changes in the volume of the absorption solution are considered for concentration calculations.

The anions of interest (bromide, chloride, fluoride, and sulfate) are separated by ion chromatography, and detected with a conductivity detector. To reduce the total conductivity caused by the eluent a suppressor unit (cation exchange unit) is used [4].