Soil, treated biowaste and sludge - Determination of adsorbed organically bound halogens (AOX)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16166:2021 sisaldab Euroopa standardi EN 16166:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 16166:2021 consists of the English text of the European standard EN 16166:2021.
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 22.12.2021.	Date of Availability of the European standard is 22.12.2021.
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.

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EUROPEAN STANDARD

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English Version

Soil, treated biowaste and sludge - Determination of adsorbed organically bound halogens (AOX)

Boues, biodéchets traités, sols et sédiments - Détermination des composés organiques halogénés adsorbables (AOX)

Boden, behandelter Bioabfall und Schlamm - Bestimmung von adsorbierten organisch gebundenen Halogenen (AOX)

This European Standard was approved by CEN on 22 November 2021.

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

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European foreword

This document (EN 16166:2021) 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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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.

This document supersedes EN 16166:2012.

In comparison with the previous edition, the following technical modifications have been made:

— Calculation harmonized with EN ISO 9562;

— Initial check and daily check procedure harmonized with EN ISO 9562 and extended to include full measuring process.

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.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is applicable and validated for several types of matrices as indicated in Table 1 (see also Annex A for the results of the validation).

NOTE This method can also be applied to other environmental solid matrices, provided the user has verified the applicability.

Table 1 — Matrices for which this document is applicable and validated

Matrix	Materials used for validation
Sludge	Municipal sludge
Compost	Fresh compost
	Compost
Soil	Sludge amended soil
	Agricultural soil

WARNING — Persons using this document should be familiar with usual laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

IMPORTANT — It is absolutely essential that tests conducted according to this document be carried out by suitably trained staff.

1 Scope

This document specifies an operationally defined method for the direct determination of organically bound halogens (chlorine, bromine and iodine) adsorbed and occluded to the sample matrix. AOX being a methodologically defined parameter, it is essential that the procedure is applied without any modification.

This document is intended for analysis of sludge, treated biowaste or soil in concentrations ranging from 5 mg/kg dry matter. The upper limit and exact concentration range covered depend on the instrumentation used for determination.

NOTE This method can also be applied to other environmental solid matrices, provided the user has verified the applicability.

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/ui

3.1
adsorbed organically bound halogens, AOX
amount of chlorine, bromine, and iodine contained as organic compounds in the sample matrix, expressed as chloride, when determined according to this document

Note 1 to entry: This includes halogenated organic compounds adsorbed at the dry sample matrix as well as water soluble halogenated compounds that can be adsorbed on to activated carbon.

4 Principle

Activated carbon is added to a dried, homogenized solid sample. Inorganic halides are eluted and at the same time water soluble organic compounds are adsorbed onto the activated carbon by shaking with acidified nitrate solution.

The loaded carbon/sample mixture is combusted in an oxygen stream.

The hydrogen halides produced are absorbed followed by the determination of the halide ions, for example, by microcoulometric titration. The result is expressed as the mass fraction of chloride.

5 Interferences

Sparingly soluble or occluded inorganic halides are included in the determination and can, if present, give a significant positive bias. Adequate washing is essential to remove inorganic interference.

Iodide contained in the sample can be adsorbed to the active carbon and not be washed off, thus leading to positive bias.

Organic bromine and iodine compounds can, during combustion, lead to the formation of elemental bromine or iodine respectively or to the formation of halogen oxides. The determination of these AOX fractions can be incomplete, thus leading to negative bias.