SLOVENSKI STANDARD
SIST EN ISO 9562:2005

01-februar-2005

Nadomeġļa:
SIST EN 1485:1997

Kakovost vode ï Doloļanje organsko vezanih halogenov, sposobnih adsorpcije (AOX)(ISO 9562:2004)

Water quality - Determination of adsorbable organically bound halogens (AOX) (ISO 9562:2004)

Wasserbeschaffenheit - Bestimmung absorbierbarer organisch gebundener Halogene (AOX) (ISO 9562:2004)

Qualité de l'eau - Dosage des composés organiques halogénés adsorbables (AOX) (ISO 9562:2004)

Ta slovenski standard je istoveten z: **EN ISO 9562:2004**

ICS:

13.060.50	Preiskava vode na kemiļne snovi	Examination of water for chemical substances

SIST EN ISO 9562:2005 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

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English version

Water quality - Determination of adsorbable organically bound halogens (AOX) (ISO 9562:2004)

Qualité de l'eau - Dosage des composés organiques halogénés adsorbables (AOX) (ISO 9562:2004)

Wasserbeschaffenheit - Bestimmung absorbierbarer organisch gebundener Halogene (AOX) (ISO 9562:2004)

This European Standard was approved by CEN on 2 September 2004.

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Foreword

This document (EN ISO 9562:2004) has been prepared by Technical Committee ISO/TC 147 "Water quality" in collaboration with Technical Committee CEN/TC 230 "Water analysis", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

This document supersedes EN 1485:1996.

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

Endorsement notice

The text of ISO 9562:2004 has been approved by CEN as EN ISO 9562:2004 without any modifications.

INTERNATIONAL STANDARD

ISO 9562

Third edition
2004-09-15

Water quality — Determination of adsorbable organically bound halogens (AOX)

Qualité de l'eau — Dosage des composés organiques halogénés adsorbables (AOX)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 9562 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

This third edition cancels and replaces the second edition (ISO 9562:1998), which has been technically revised.

Introduction

Adsorbable organically bound halogens (AOX) is an analytical convention. The result is a parameter used for water quality control purposes. It represents the sum of organically bound chlorine, bromine and iodine (but not fluorine) that can be adsorbed on activated carbon under specified conditions and, if the sample is not filtered, includes that associated with suspended matter.

The user should be aware that particular problems could require the specification of additional marginal conditions.

Water quality — Determination of adsorbable organically bound halogens (AOX)

WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This International Standard 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 International Standard be carried out by suitably qualified staff.

1 Scope

This International Standard specifies a method for the direct determination of an amount of usually 10 µg/l in water of organically bound chlorine, bromine and iodine (expressed as chloride) adsorbable on activated carbon.

This method is applicable to test samples (see 9.2) with concentrations of inorganic chloride ions of less than 1 g/l. Samples with higher concentrations are diluted prior to analysis.

This method is also applicable to samples containing suspended solids where halogens are adsorbed onto the solid matter (e.g. insoluble halides). Filtration of the sample before analysis allows the separate determination of dissolved and particulate adsorbable organically bound halogens (AOX).

Filtered samples with high inorganic chloride content can be analysed by a modified method [dissolved adsorbable organically bound halogens after solid phase extraction in waters with high salt content (SPE-AOX)] (see Annex A). However, results obtained by this modified method can differ significantly from those of the required method.

2 Normative references

The following referenced documents are indispensable for the application 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 1773:1997, *Laboratory glassware — Narrow-necked boiling flasks*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

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

3.1
adsorbable organically bound halogens
AOX
equivalent amount of chlorine, bromine, and iodine contained in organic compounds, expressed as chloride when determined according to this International Standard

3.2
dissolved organic carbon
DOC
amount of organically bound carbon present in water originating from compounds passing through a membrane filter of 0,45 µm pore size and including cyanate and thiocyanate

4 Interferences

4.1 High AOX values can result from the presence of active chlorine and of some inorganic bromine and iodine compounds, irreversibly bound to activated carbon. Reactions of these oxidizing agents with organic substances in the sample and with the activated carbon can be prevented by the addition of sodium sulfite, immediately after sampling.

4.2 Organic bromine and iodine compounds may, during combustion, decompose to elemental bromine or iodine respectively and this can yield higher oxidation states of these elements. These fractions of AOX may be incompletely determined, thus leading to negative bias.

4.3 Samples containing living cells (for example microorganisms or algae) may give rise to high results because of their chloride content. In these cases, the sample is not analysed until at least 8 h after acidification.

4.4 For samples with high chloride concentrations (approximately 1 g/l), the shaking procedure (9.3.2) can result in higher interferences than the column procedure (9.3.4).

4.5 Alcohols, aromatic compounds, or carboxylic acids may give rise to negative bias (e.g. in case of DOC values > 100 mg/l).

4.6 For samples containing suspended solids, the stirring method (9.3.3) may lead to an insufficient covering of the particles. If the particles contain substances contributing to the AOX, the shaking or column method is recommended.

4.7 The recovery of some polar and hydrophilic compounds, such as monochloroacetic acid, is incomplete.

5 Principle

Acidification of the water sample with nitric acid. Adsorption of organic compounds contained in the sample onto activated carbon, either by a shaking procedure, a stirring procedure, or by column adsorption. Displacement of inorganic halides by rinsing the activated carbon with sodium nitrate solution acidified with nitric acid. Combustion of the loaded carbon in an oxygen stream. Absorption of the hydrogen halides in an acceptor solution followed by determination of the halide ions by an argentometric titration, such as microcoulometry. Expression of the result as the mass concentration of chloride.

6 Reagents

Use only reagents of recognized analytical grade. The purity of water, reagents and gases shall be confirmed.

The AOX content shall be negligible when compared with the lowest AOX content to be determined. The overall AOX content of water, chemicals and gases can be checked by measuring the total blank (10.2).

6.1 **Water**, Grade 1 as specified in ISO 3696:1987.

6.2 **Activated carbon**, the handling of which is given in Annex B, for one of three procedures listed in 6.2.1 to 6.2.3.