

**Vee kvaliteet. Elavhõbedasisalduse
määramine. Amalgaamimisega
rikastusmeetodid**

Water quality - Determination of mercury -
Enrichment methods by amalgamation

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 12338:1999 sisaldab Euroopa standardi EN 12338:1998 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 12.12.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12338:1999 consists of the English text of the European standard EN 12338:1998.</p> <p>This document is endorsed on 12.12.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: Käesolev Euroopa standard esitab elavhõbedasisalduse määramise kaks võimalikku varianti, kasutades redutseerijana kas tina(II)kloriidi või naatriumtetrahüdroboraati. Kirjeldatud meetodid on sobivad elavhõbeda määramiseks vees, näiteks põhja-, pinna- ja heitvees, kontsentratsioonivahemikus 0,01 - 1 µg/l. Kõrgemaid kontsentratsioone on võimalik määrata lahjendatud veeproovi puhul. Vee üldine elavhõbedasisaldus määratakse pärast proovi digereerimist. Kui on vaja määrata ainult lahustuvaid elavhõbedaühendeid, filtritakse proov enne digereerimist, kasutades 0,45 µm membraanfiltrit. Ühe- või kahevalentne elavhõbe redutseeritakse elementaarkujuni happelises keskkonnas, kasutades selliseid redutseerijaid nagu tina(II)kloriid, SnCl₂, või naatriumtetrahüdroboraat NaBH₄. Elementaarne elavhõbe eraldatakse lahusest inertgaasi voo abil ja juhitakse üle suure pindalaga väärismetalli pinna. Selliseks väärismetalli pinnaks on kuld/plaatina võrgu pind, kus elavhõbe absorbeeritakse.</p>	<p>Scope:</p>
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Võtmesõnad: elavhõbe, keemiline analüüs, naatriumtetrahüdroboraat, pinnavesi, põhjavesi, redutseerimismeetodid, reovesi, sisalduse määramine, tinakloriid, veetestid

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Descriptors: Water quality, mercury, amalgamation, testing.

English version

Water quality

Determination of mercury – Enrichment methods by amalgamation

Qualité de l'eau – Dosage du mercure – Méthodes après enrichissement par amalgame

Wasserbeschaffenheit – Bestimmung von Quecksilber – Verfahren nach Anreicherung durch Amalgamierung

This European Standard was approved by CEN on 1998-06-21.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by 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 January 1999, and conflicting national standards shall be withdrawn at the latest by January 1999.

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

Annexes designated "informative" are only given for information. In this Standard annexes A, B, C and D are informative.

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Introduction

It should be investigated whether and to what extent particular problems will require the specification of additional marginal conditions.

It is absolutely essential that tests conducted according to this standard are carried out by suitably qualified staff.

In natural water sources, mercury compounds generally occur only in very small concentrations of less than 0,1 $\mu\text{g/l}$. Higher concentrations may be found, for example, in waste water.

Both inorganic and organic compounds of mercury can be present. Mercury may accumulate in sediment and sludge.

WARNING

Mercury and mercury compounds are very toxic. Extreme caution is recommended when handling samples and solutions which contain or may contain mercury.

1 Scope

This European Standard specifies the determination of mercury in two parts which use either tin(II)chloride or sodium tetrahydroborate as reducing agent. The methods described in clauses 4 and 5 are suitable for the determination of mercury in water, for example in ground, surface and waste waters, in the concentration range from 0,01 $\mu\text{g/l}$ to 1 $\mu\text{g/l}$. Higher concentrations may be determined if the water sample is diluted.

The total mercury content of water is determined after digestion of the sample. If only soluble mercury compounds are to be determined, a filtration step using a 0,45 μm membrane filter is applied prior to digestion.

Mono- or divalent mercury is reduced to the elemental form by a reducing agent such as tin(II) chloride, SnCl_2 , or sodium tetrahydroborate, NaBH_4 , in an acid medium. Elemental mercury is then stripped from the solution with the aid of a stream of inert gas and transported over a noble metal surface with a large area, such as gold/platinum gauze, on which the mercury is adsorbed. The mercury is released by rapid heating of the adsorbant and further transported in a stream of carrier gas to a suitable cuvette. Absorbances are measured at a wavelength of 253,7 nm in the radiation beam of an atomic absorption spectrometer. Concentrations are calculated using a calibration curve.

In order to fully decompose all of the mercury compounds, a digestion procedure is required. Digestion can be omitted only if it is certain that the mercury concentration may be measured without this pretreatment.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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| EN 25667-1 : 1993 | Water quality – Sampling – Part 1: Guidance on the design of sampling programmes (ISO 5667-1 : 1980) |
| EN 25667-2 : 1993 | Water quality – Sampling – Part 2 : Guidance on sampling techniques (ISO 5667-2 : 1991) |
| EN ISO 5667-3 : 1995 | Water quality – Sampling – Part 3: Guidance on the preservation and handling of samples (ISO 5667-3 : 1994) |