

**Vee kvaliteet. Arseeni sisalduse määramine.  
Aatomabsorptsioon-spektromeetriline  
meetod (hüdriidmeetod)**

Water quality - Determination of arsenic - Atomic  
absorption spectrometric method (hydride technique)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 11969:1999 sisaldab Euroopa standardi EN ISO 11969:1996 ingliskeelset teksti.

Käesolev dokument on jõustatud 12.12.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 11969:1999 consists of the English text of the European standard EN ISO 11969:1996.

This document is endorsed on 12.12.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

### Käsitlusala:

Standard esitab meetodi arseeni sisalduse, kaasa arvatud orgaanilistes ühendites sisalduva arseeni sisalduse, määramiseks joogi-, põhja- ja pinnavees kontsentratsioonivahemikus 1 µg/l kuni 10 µg/l. Kõrgemaid kontsentratsioone on võimalik määrata, kasutades veeproovi sobivat lahjendamist.

### Scope:

**ICS** 13.060.50

**Võtmesõnad:** aatomabsorptsioon-spektromeetriline meetod, arseen, keemiline analüüs, kvaliteet, sisalduse määramine, veereostus, veetestid, vesi

ICS 13.060.40

Descriptors: Water analysis, arsenic.

**English version**

**Water quality**

Determination of arsenic

Atomic absorption spectrometric method (hydride technique)  
(ISO 11969:1996)

Qualité de l'eau – Dosage de l'arsenic –  
Méthode par spectrométrie d'absorption  
atomique (technique hydruire)  
(ISO 11969:1996)

Wasserbeschaffenheit – Bestimmung von  
Arsen – Atomabsorptionsspektrometrie  
(Hydridverfahren) (ISO 11969:1996)

This European Standard was approved by CEN on 1996-06-28 and is identical to the ISO Standard as referred to.

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.

This European Standard exists 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

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

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

International Standard

ISO 11969:1996 Water quality – Determination of arsenic – Atomic absorption spectrometric method (hydride technique), which was prepared by ISO/TC 147 'Water quality' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 230 'Water analysis' as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by February 1997 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 11969:1996 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

**WARNING — Arsenic and arsenic compounds are toxic and are recognized as human carcinogens. Avoid any exposure by inhalation. Personal protection must be used in all cases where exposure to arsenic or arsenic compounds is possible.**

## 1 Scope

This International Standard specifies a method for the determination of arsenic including organically bound arsenic in drinking waters, ground waters and surface waters, in a concentration range from 1 µg/l to 10 µg/l.

Higher concentrations can be determined by using a suitable dilution of the water sample.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5667-1:1980, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes*.

ISO 5667-2:1991, *Water quality — Sampling — Part 2: Guidance on sampling techniques*.

ISO 5667-3:1994, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples*.

## 3 Principle

The method is based on the atomic absorption measurement of arsenic generated by the thermal decomposition of arsenic(III) hydride.

Under the conditions of this method, only As(III) is quantitatively converted to the hydride. To avoid errors in determination, other oxidation states need to be converted to As(III) prior to the determination.

As(III) is reduced to gaseous arsenic(III) hydride (AsH<sub>3</sub>) by reaction with sodium tetrahydroborate in a hydrochloric acid medium.

The absorbance is determined at a wavelength of 193,7 nm.

## 4 Reagents

During the analysis, use only reagents of recognized analytical grade.

The arsenic content of the water and the reagents shall be negligible, compared with the lowest concentration to be determined.

**4.1 Sulfuric acid** (H<sub>2</sub>SO<sub>4</sub>),  $\rho = 1,84$  g/ml.

**4.2 Hydrochloric acid** (HCl),  $\rho = 1,15$  g/ml.

**4.3 Hydrogen peroxide** (H<sub>2</sub>O<sub>2</sub>),  $w = 30\%$  (m/m).

**4.4 Sodium hydroxide** (NaOH).