Vee kvaliteet. Lahustunud fluoriid-, kloriid-, nitrit-, ortofosfaat-, bromiid-, nitraat- ja sulfaatioonide sisalduse määramine, kasutades ioonvahetus-vedelikkromatograafiat. Osa 1: Meetod madala reostusega vee jaoks

Water quality - Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulfate ions, using liquid chromatography of ions - Part 1: Method for water with low contamination

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 10304-1:1999 sisaldab Euroopa standardi EN ISO 10304-1:1995 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 10304-1:1999 consists of the English text of the European standard EN ISO 10304-1:1995.
Standard on kinnitatud Eesti Standardikeskuse 12.12.1999 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 12.12.1999 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 10.03.1995.	Date of Availability of the European standard text 10.03.1995.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 13.060.50

Võtmesõnad: bromiidid, fluoriidid, keemiline analüüs, kloriidid, kvaliteet, lahustuv aine, nitraadid, nitritid, ortofosfaadid, sisalduse määramine, sulfaadid, suure jõudlusega vedelikkromatograafia, veereostus, vesi

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 10304-1

March 1995

ICS 13.060.40

Descriptors: Water analysis, drinking water, surface water, testing.

English version

Water quality

Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulfate ions, using liquid chromatography of ions
Part 1: Method for water with low contamination
(ISO 10304-1:1992)

Qualité de l'eau; dosage des ions fluorure, chlorure, nitrite, orthophosphate, bromure, nitrate et sulfate dissous, par chromatographie des ions en phase liquide. Partie 1: Méthode applicable pour les eaux faiblement contaminées (ISO 10304-1:1992)

Wasserbeschaffenheit; Bestimmung der gelösten Anionen Fluorid, Chlorid, Nitrit, Orthophosphat, Bromid, Nitrat und Sulfat mittels Ionenchromatographie. Teil 1: Verfahren für gering belastete Wässer (ISO 10304-1:1992)

This European Standard was approved by CEN on 1994-11-03 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 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 10304-1:1992 Water quality; determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulfate ions, using liquid chromatography of ions; method for water with low contamination,

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 September 1995 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 United Kingdom.

Endorsement notice

The text of the International Standard ISO 10304-1:1992 was approved by CEN as a European Standard without any modification.

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

Introduction

Many different ion-exchange chromatography systems can be considered. It is therefore not appropriate to indicate the type of column, mobile phase, detector type etc. that is to be used. Thus detailed information is not given at any stage during the method, although guidance is provided. However, the quality parameters which should be met by the chromatography conditions chosen are defined.

1 Scope

1.1 General

This part of ISO 10304 specifies a method for the determination of fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulfate in water with low contamination (e.g. drinking water, rain water, ground water and surface water) in the following ranges:

Fluoride (F):	0,01 mg/l to 10 mg/l
Chloride (Cl):	0,1 mg/l to 50 mg/l
Nitrite (NO_2):	0,05 mg/l to 20 mg/l
Orthophosphate (PO_4):	0,1 mg/l to 20 mg/l
Bromide (Br):	0,05 mg/l to 20 mg/l
Nitrate (NO_3):	0,1 mg/l to 50 mg/l
Sulfate (SO_4):	0,1 mg/l to 100 mg/l

NOTE 1 Anion symbols are used without charges throughout the text.

In certain cases, the range of application may be changed by variations in the working conditions (e.g. sample volume, dilution, separating columns, preconcentration techniques, sensitivity ranges of detectors, etc.).

1.2 Interferences

1.2.1 Some organic acids, such as malonic acid, maleic acid and malic acid, may interfere in the determination of inorganic anions if they are present in high concentrations.

1.2.2 The determination of fluoride in particular is subject to interference by formic acid, acetic acid and carbonate, even at low concentrations.

1.2.3 Cross sensitivity (lack of resolution) may occur in the case of large differences in concentration between the anions determined (F, Cl, NO_2, PO_4, Br, NO_3, SO_4).

1.2.4 The bromide and phosphate anions do not interfere in the working range specified, unless otherwise stated.

1.2.5 In a buffered eluent (e.g. carbonate/hydrogencarbonate), the determination will not be influenced by the sample pH in the range of pH 2 to pH 9.

1.2.6 The concentration ratios given in table 1 were checked experimentally for various representative conditions. No interferences could be observed when 50 µl of sample volume was used for the chromatographic analysis.

1.2.7 The information in 1.2.4 to 1.2.6 is valid only as long as the quality requirements of the separating column are fulfilled (see clause 6) and the electrical conductivity of the sample is less than 1 000 µS/cm (except fluoride: < 500 µS/cm). For natural samples, the peak resolution (R) needs to be better than 1,3 (see figure 3).

1.2.8 Solid material and organic compounds (e.g. mineral oils, detergents and humic acids) shorten the life-time of the separating column. They should therefore be removed from the sample prior to analysis (see clause 7).