

**Vee kvaliteet. Nitritis ja nitraadis sisalduva
lämmastiku sisalduse ja nende mõlema
summa määramine pidevvoolumanalüüsil
(CFA ja FIA) ja spektromeetrilisel
detektsioonil**

Water quality - Determination of nitrite nitrogen and
nitrate nitrogen and the sum of both by flow analysis
(CFA and FIA) and spectrometric detection

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 13395:1999 sisaldab Euroopa standardi EN ISO 13395:1996 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 ISO 13395:1999 consists of the English text of the European standard EN ISO 13395:1996.</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>
--	---

<p>Käsitlusala:</p> <p>Käesolev rahvusvaheline standard esitab meetodi nitriti (N) ja nitraadi (N) sisalduse ja nende mõlema summa (nitriti/nitraati (N)) määramiseks mitmesugust tüüpi vetes (nagu põhja-, joogi-, pinna- ja heitvees), massikontsentratsioonidega 0,01 mg/l kuni 1 mg/l nitriti (N) jaoks ja 0,2 mg/l kuni 20 mg/l nitriti/nitraadi (N) jaoks. Mõlemad kontsentratsioonid on mõeldud lahjendamata proovi jaoks.</p>	<p>Scope:</p>
--	----------------------

ICS 13.060.50

Võtmesõnad: keemiline analüüs, kvaliteet, lämmastik, nitraadid, nitritid, sisalduse määramine, veereostus, veetestid, vesi

ICS 13.060.40

Descriptors: Water analysis, nitrite nitrogen, nitrate nitrogen.

English version

Water quality

Determination of nitrite nitrogen and nitrate nitrogen and the sum of both by flow analysis (CFA and FIA) and spectrometric detection
(ISO 13395:1996)

Qualité de l'eau – Détermination de l'azote nitreux et de l'azote nitrique et de la somme des deux par analyse en flux (CFA et FIA) et détection spectrométrique
(ISO 13395:1996)

Wasserbeschaffenheit – Bestimmung von Nitritstickstoff, Nitratstickstoff und der Summe von beiden mit der Fließanalytik (CFA und FIA) und spektrometrischer Detektion (ISO 13395:1996)

This European Standard was approved by CEN on 1996-06-09 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 13395:1996 Water quality – Determination of nitrite nitrogen and nitrate nitrogen in water and the sum of both by flow analysis (CFA and FIA) and spectrometric detection,

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 January 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 13395:1996 was approved by CEN as a European Standard without any modification.

Introduction

Methods using flow analysis enable wet chemistry procedures to be automatized and are particularly suitable for the processing of many analytes in water in large series of samples at a high analysis frequency (up to 100 samples per hour).

A differentiation is made between flow injection analysis (FIA) [1][2] and continuous flow analysis (CFA) [3]. Both methods share the feature of an automatic dosage of the sample into a flow system (manifold) where the analytes in the sample will react with the reagent solutions on their way through the manifold. The sample preparation may be integrated in the manifold. The reaction product is measured in a flow detector (e.g. flow photometer).

1 Scope

This International Standard specifies a method for the determination of nitrite(N) (see note 2), nitrate(N) or the sum of both [nitrite/nitrate(N)], in various types of waters (such as ground, drinking, surface, and waste waters) in mass concentrations ranging from 0,01 mg/l to 1 mg/l for nitrite(N) and from 0,2 mg/l to 20 mg/l for nitrite/nitrate(N), both in the undiluted sample. The range of application can be changed by varying the operating conditions.

NOTES

1 Seawater may be analysed with changes in respect to sensitivity and adaptation of the carrier solution and calibration solutions to the salinity of the samples.

2 The following concise terms are used in the text of this International Standard:

nitrite(N):	(mass concentration of) nitrite, expressed as nitrogen
nitrate(N):	(mass concentration of) nitrate, expressed as nitrogen
nitrite/nitrate(N):	(mass concentration of) the sum of nitrite(N) and nitrate(N)

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

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.*

ISO 6777:1984, *Water quality — Determination of nitrite — Molecular absorption spectrometric method.*

3 Principle

3.1 Sum of nitrite(N) and nitrate(N), nitrite/nitrate(N)

With flow injection analysis (FIA), the sample is fed into a continuously flowing buffer solution (carrier stream) by means of an injection valve, or, with continuous flow analysis (CFA) being applied, it is continuously mixed with this buffer solution. Nitrate in the sample is reduced with metallic cadmium to nitrite[4]. Then, a phosphoric acid reagent solution that is also flowing continuously is admixed. Nitrite that is initially present and nitrite resulting from the reduction of nitrate will diazotize sulfanilamide in acid solution to the diazonium salt which is then coupled with *N*-(1-naphthyl)ethylenediamine to form a red dye [5] [6][7].

Waste containing cadmium in liquid or solid form shall be removed appropriately.