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BSI Standards Publication

Water quality — Determination of fluoride using flow analysis (FIA and CFA)

Part 2: Method using continuous flow analysis (CFA) with automated in-line distillation

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National foreword

This Published Document is the UK implementation of ISO/TS 17951-2:2016.

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A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Part 2: Method using continuous flow analysis (CFA) with automated in-line distillation

Qualité de l'eau — Dosage des fluorures par analyse en flux (FIA et CFA) —

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

ISO 17951 consists of the following parts, under the general title *Water quality — Determination of fluoride using flow analysis (FIA and CFA)*:

— *Part 1: Method using flow injection analysis (FIA) and spectrometric detection after off-line distillation* [Technical Specification]

— *Part 2: Method using continuous flow analysis (CFA) with automated in-line distillation* [Technical Specification]

Introduction

Fluorine compounds in waters and effluents exist in various chemical forms, such as fluoride ion, complexes of iron, aluminium, boron and etc., as well as insoluble forms, such as calcium and magnesium fluorides. Excess fluoride can cause bone damage and fluorosis. In order to ensure conversion of any insoluble fluorides into soluble fluoride for measurement, steam distillation is necessary.

This part of ISO 17951 describes a CFA method for flow analysis of fluoride with integrated in-line distillation and spectrometric detection.

A CFA method with ion-selective detection is described in Annex B.

Water quality — Determination of fluoride using flow analysis (FIA and CFA) —

Part 2:
Method using continuous flow analysis (CFA) with automated in-line distillation

WARNING — Persons using this part of ISO 17951 should be familiar with normal laboratory practice. This part of ISO 17951 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 in accordance with this part of ISO 17951 be carried out by suitably qualified staff.

1 Scope

This part of ISO 17951 specifies a method for the determination of fluoride in waters, waste waters and effluents by continuous flow analysis (CFA). Any insoluble or complexed fluoride is converted to fluoride ion by an automated continuous flow distillation procedure from sulfuric/phosphoric acid. Fluoride ion in the distillate is measured using flow analysis with lanthanum alizarin complexone and spectrometric detection. This method is applicable to industrial waste waters, effluents, surface waters, ground waters, leachates. When this method is applied to the analysis of drinking water, a heater and a distillation unit is unnecessary. Some drinking water contains high concentration of aluminium and iron. In the case of drinking water, this part of ISO 17951 is appropriate to drinking water with low interferences. It is not applicable to samples which contain large amount of suspended matter.

In this part of ISO 17951, two working ranges are described:

— working range I: 0,1 mg/l to 1,0 mg/l;

— working range II: 1,0 mg/l to 10 mg/l.

The specification of the calibration solutions are to be adapted accordingly.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 6353-2, *Reagents for chemical analysis — Part 2: Specifications — First series*

ISO 8466-1, *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics — Part 1: Statistical evaluation of the linear calibration function*

ISO 8466-2, *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics — Part 2: Calibration strategy for non-linear second-order calibration functions*

