
**Water quality — Determination of chloride
by flow analysis (CFA and FIA) and
photometric or potentiometric detection**

*Qualité de l'eau — Dosage du chlorure par analyse en flux (CFA et FIA) et
par détection photométrique ou potentiométrique*



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15682 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

Annexes A, B and C of this International Standard are for information only.

Introduction

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

Differentiation is required between flow injection analysis (FIA) [1, 2], and continuous flow analysis (CFA) [3]. Both methods share the feature of automatic dosage of the sample into a flow system (manifold) where the analytes in the sample react with the reagent solutions on their way through the manifold. The sample preparation may be integrated in the manifold. The amount of reaction product is measured in a flow detector (e.g. photometer, or ion-selective electrode). The detector produces a signal from which the concentration of the parameter is calculated.

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

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Water quality — Determination of chloride by flow analysis (CFA and FIA) and photometric or potentiometric detection

1 Scope

This International Standard specifies two methods for the determination of chloride by flow analysis. The two basic methods are covered in separate clauses as follows:

- a) Clause 3: Determination of chloride by flow analysis and photometric detection.
- b) Clause 4: Determination of chloride by flow analysis and potentiometric detection.

Both methods are applicable to the analysis of water and waste water (including leachates) containing chloride in the concentration range from 1 mg/l to 1 000 mg/l. On a case-by-case basis the range of the analysis can be changed.

After dilution, samples with a chloride concentration > 1 000 mg/l can also be analysed.

The method with potentiometric detection is also applicable to turbid and/or coloured samples.

NOTE From the ecological point of view, the potentiometric method is preferable because it avoids the use of toxic reagents. When the photometric method is applied, volatile and solid wastes containing mercury should be discarded in accordance with environmental regulations.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, this publication do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

3 Determination of chloride by flow analysis (FIA and CFA) with photometric detection

3.1 Principle

When using FIA, the sample is injected into a continuous flowing carrier stream (water) through an injection valve. When using CFA, the sample is pumped into the carrier stream via a peristaltic pump. Depending on the concentration of the sample, the sample is diluted with water. A reagent solution (mercury thiocyanate iron(III) nitrate solution), also pumped by the peristaltic pump, is then mixed with the sample stream. The thiocyanate, which is liberated by the chloride, reacts with the iron(III) ions to form a red-coloured iron(III) thiocyanate complex [4], [5], [6].

It is absolutely essential that the tests described in this International Standard be carried out by suitably qualified staff.