
**Water quality — Determination of
chromium — Atomic absorption
spectrometric methods**

*Qualité de l'eau — Dosage du chrome — Méthodes par spectrométrie
d'absorption atomique*



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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.

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.

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

International Standard ISO 9174 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical, biochemical methods*.

This second edition cancels and replaces the first edition (ISO 9174:1990), which has been technically revised.

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

Introduction

Chromium occurs in water in the oxidation states III and VI. The two methods described in this International Standard determine chromium in both oxidation states, either as acid-soluble chromium or as water-soluble chromium, depending on the sample pretreatment. The method chosen depends on the concentration of chromium in the water to be examined.

Annex A provides information on pretreatment and digestion of chromium from sludges and sediments.

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Water quality — Determination of chromium — Atomic absorption spectrometric methods

1 Scope

This International Standard specifies two methods for the determination of chromium in water by atomic absorption spectrometry. The two methods are covered in separate clauses as follows:

- Clause 3: Determination of chromium by flame atomic absorption spectrometry;
- Clause 4: Determination of chromium by electrothermal atomization atomic absorption spectrometry.

Clause 3 is applicable to the analysis of water and waste water when the concentration range is between 0,5 mg/l and 20 mg/l of chromium. When the concentration is below 0,5 mg/l, the determination can be carried out after carefully evaporating an acidified sample to small volume, taking care to avoid the formation of a precipitate.

NOTE The use of evaporation will increase the effect of interfering substances and therefore for concentrations below 0,1 mg/l the method in clause 4 is given.

Clause 4 is applicable to the analysis of water and waste water when the concentration range is between 5 µg/l and 100 µg/l of chromium by injecting a sample volume of 20 µl. It is applicable to the determination of higher concentrations by using a smaller sample volume.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents 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 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 Determination of chromium by flame atomic absorption spectrometry

3.1 Principle

The method is based on the atomic absorption spectrometric measurement of the chromium content of the acidified sample in a nitrous oxide/acetylene flame. Measurement at a wavelength of 357,9 nm. Addition of lanthanum salt to reduce matrix interferences is necessary.

3.2 Reagents

All reagents shall be of recognized analytical grade. Use deionized water or water distilled from an all-glass apparatus. The water used for blank tests and for preparing reagents and standard solutions shall have a chromium content that is negligible compared with the smallest concentrations to be determined in the samples.