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

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



Foreword

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Introduction

Aluminium may be present in water in ionic or complex form. It may be dissolved or finely dispersed. Even with the digestion described in 2.5.3, silicates and oxidic aluminium compounds may not in all cases be quantitatively covered by these methods. Clause 2 refers to the determination of aluminium by flame atomic absorption spectrometry (AAS); in clause 3 a graphite furnace AAS method is described.

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Water quality – Determination of aluminium – Atomic absorption spectrometric methods

1 Scope

This International Standard describes two atomic absorption spectrometric (AAS) methods for the determination of aluminium in water.

1.1 Flame AAS

The flame AAS method (clause 2) is applicable for the determination of aluminium in water in mass concentrations from 5 mg/l to 100 mg/l. Higher concentrations may be determined after an appropriate dilution of the sample. Careful evaporation of the sample, acidified with nitric acid, may be used to extend the working range of the method to lower concentrations as long as no precipitation is observed.

NOTE – If the linear range of the instrument is sufficiently large, concentrations < 5 mg/l may be determined with this method; otherwise the determination needs to be carried out in the graphite furnace, as described in clause 3.

If the determination of the total content of aluminium is required, a digestion of the sample according to 2.5.3 is necessary. Silicates and aluminium oxide compounds may, however, not be quantitatively determined with this digestion procedure.

1.2 Graphite furnace

The graphite furnace AAS method (clause 3) is applicable for the determination of aluminium in waters and waste waters in mass concentrations from 10 µg/l to 100 µg/l applying a dosing volume of 20 µl. The working range can be shifted to higher concentrations either by dilution of the sample or by using a smaller sample volume.

2 Determination of aluminium by atomic absorption spectrometry in a nitrous oxide/acetylene flame

2.1 Interferences

The following ions can interfere with the flame AAS method, if the concentrations listed below are exceeded:

Sulfate	10 000 mg/l
Chloride	10 000 mg/l
Phosphate	10 000 mg/l
Sodium	10 000 mg/l
Potassium	10 000 mg/l
Magnesium	10 000 mg/l
Calcium	10 000 mg/l
Iron	10 000 mg/l
Nickel	10 000 mg/l
Cobalt	10 000 mg/l
Cadmium	3 000 mg/l
Lead	10 000 mg/l