International Standard ISO 7890/1

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Water quality — Determination of nitrate — Part 1: 2,6-Dimethylphenol spectrometric method

Qualité de l'eau — Dosage des nitrates — Partie 1: Méthode spectrométrique au diméthyl-2,6 phénol

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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INTERNATIONAL STANDARD ISO 7890/1-1986 (E)

Water quality — Determination of nitrate — Part 1: 2,6-Dimethylphenol spectrometric method

1 Scope and field of application

1.1 Substance determined

This part of ISO 7890 specifies a method for the determination of nitrate ion in water.

1.2 Type of sample

This method is applicable to the direct analysis of potable and raw water.

NOTE — Polluted waters and saline waters should be analysed by the procedures given in ISO 7890/2, *Water quality — Determination of nitrate — Part 2: 4-Fluorophenol spectrometric method after distillation.*

1.3 Range

A nitrate nitrogen concentration, ϱ_N, of up to 25 mg/l in the test portion can be determined.

1.4 Limit of detection

A nitrate nitrogen concentration of $\varrho_N = 0{,}06$ mg/l.

1.5 Sensitivity

A nitrate nitrogen content of $\varrho_N = 25$ mg/l gives an absorbance of about 1,5 units in a cell of path length 10 mm.

1.6 Interferences

Potential interference from nitrite nitrogen at concentrations of up to at least $\varrho_N = 5$ mg/l is controlled by the use of amidosulfonic acid.

Chloride may seriously interfere, but can be removed by addition of silver sulfate to the test sample and filtration prior to taking the test portions (see clause 8). The effect of chloride on the determination and the effectiveness of the chloride removal procedure are shown in the annex.

2 Principle

Reaction of nitrate with 2,6-dimethylphenol in the presence of sulfuric and phosphoric acids to produce 4-nitro-2,6-dimethylphenol. The reaction time is about 5 min. Spectrometric measurement of the absorbance of the reaction product at 324 nm and reading of the nitrate concentration in the test portion from a calibration graph.

3 Reagents

During the analysis, use only reagents of recognized analytical grade, and only distilled water or water of equivalent purity.

3.1 Glacial acetic acid (CH_3COOH), $\varrho \approx 1{,}05$ g/ml.

3.2 2,6-Dimethylphenol solution, 1,2 g/l.

Dissolve 1,2 ± 0,1 g of 2,6-dimethylphenol [$(CH_3)_2C_6H_3OH$] in 1 000 ± 10 ml of glacial acetic acid (3.1).

Store in a glass bottle.

This solution is stable for 1 week.

3.3 Acid mixture.

WARNING — When using this acid mixture, eye protection and protective clothing are essential. The mixture should never be pipetted by mouth.

Cautiously mix 500 ± 5 ml of sulfuric acid (H_2SO_4) ($\varrho = 1{,}84$ g/ml) with 500 ± 5 ml of orthophosphoric acid (H_3PO_4) ($\varrho = 1{,}69$ g/ml), in a 2 litre glass beaker. Add 0,040 ± 0,005 g of amidosulfonic acid (NH_2SO_3H) to the mixture and dissolve.

Store in a glass-stoppered bottle.

This solution is stable indefinitely.