International Standard 6777

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Water quality — Determination of nitrite — Molecular absorption spectrometric method

Qualité de l'eau — Dosage des nitrites — Méthode par spectrométrie d'absorption moléculaire

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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.

International Standard ISO 6777 was developed by Technical Committee ISO/TC 147, *Water quality*, and was circulated to the member bodies in December 1982.

It has been approved by the member bodies of the following countries:

Australia	Hungary	Poland
Austria	India	Romania
Belgium	Iran	South Africa, Rep. of
Brazil	Iraq	Spain
Canada	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Korea, Dem. P. Rep. of	Thailand
Egypt, Arab Rep. of	Mexico	United Kingdom
China	Netherlands	USSR
France	New Zealand	
Germany, F.R.	Norway	

No member body expressed disapproval of the document.

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Water quality — Determination of nitrite — Molecular absorption spectrometric method

1 Scope

This International Standard specifies a molecular absorption spectrometric method for the determination of nitrite in potable, raw and waste water.

2 Field of application

2.1 Range

A nitrite nitrogen concentration, ϱ_N, of up to 0,25 mg/l can be determined when using the maximum volume (40 ml) of test portion.

2.2 Limit of detection [1)]

When using cells of optical path length 40 mm and a test portion of 40 ml, the limit of detection has been determined to lie within the range ϱ_N = 0,001 to 0,002 mg/l.

2.3 Sensitivity [1)]

Using a 40 ml test portion and a cell of optical path length 40 mm, ϱ_N = 0,062 mg/l gives an absorbance of about 0,66 units.

Using a 40 ml test portion and a cell of optical path length 10 mm, ϱ_N = 0,25 mg/l gives an absorbance of about 0,67 units.

2.4 Interferences

If the alkalinity of the sample is high, some interference may be encountered (see clause 9).

A range of substances often encountered in water samples has been tested for possible interference. Full details are given in the annex. Of the substances tested, only chloramine, chlorine, thiosulfate, sodium polyphosphate and iron(III) interfere significantly.

3 Principle

Reaction of nitrite in the test portion with 4-aminobenzene sulfonamide reagent in the presence of orthophosphoric acid at pH 1,9 to form a diazonium salt which forms a pink-coloured dye with *N*-(1-naphthyl)-1,2-diaminoethane dihydrochloride (added with the 4-aminobenzene sulfonamide reagent). Measurement of the absorbance at 540 nm.

4 Reagents

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

4.1 Orthophosphoric acid, 15 mol/l solution, (ϱ = 1,70 g/ml).

4.2 Orthophosphoric acid, approximately 1,5 mol/l solution.

Add, by means of a pipette, 25 ml of the orthophosphoric acid (4.1) to 150 ± 25 ml of water. Mix and cool to room temperature. Transfer the solution to a 250 ml one-mark volumetric flask and dilute to the mark with water.

Store in an amber glass bottle. The solution is stable for at least 6 months.

4.3 Colour reagent.

WARNING — This reagent is hazardous. Skin contact or ingestion of it or its ingredients must be avoided.

Dissolve 40,0 ± 0,5 g of 4-aminobenzene sulfonamide ($NH_2C_6H_4SO_2NH_2$) in a mixture of 100 ± 1 ml of the orthophosphoric acid (4.1) and 500 ± 50 ml of water in a beaker.

Dissolve 2,00 ± 0,02 g of *N*-(1-naphthyl)-1,2-diaminoethane dihydrochloride ($C_{10}H_7$-NH-CH_2-CH_2-NH_2·2HCl) in the resulting solution. Transfer to a 1 000 ml one-mark volumetric flask and dilute to the mark with water. Mix well.

Store in an amber glass bottle. The solution is stable for 1 month if stored at 2 to 5 °C.

1) Information derived from a United Kingdom interlaboratory trial involving five participants.