

International Standard



7875/1

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Water quality — Determination of surfactants — Part 1: Determination of anionic surfactants by the methylene blue spectrometric method

Qualité de l'eau — Dosage des agents de surface — Partie 1: Dosage des agents de surface anioniques par la méthode spectrométrique au bleu de méthylène

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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.

International Standard ISO 7875/1 was prepared by Technical Committee ISO/TC 147, *Water quality*.



Water quality — Determination of surfactants —

Part 1: Determination of anionic surfactants by the methylene blue spectrometric method

0 Introduction

Anionic and non-ionic surface active substances, generally called surfactants, are used in synthetic products for general cleaning purposes.

ISO 7875 consists of the following parts:

Part 1: Determination of anionic surfactants by the methylene blue spectrometric method.

Part 2: Determination of non-ionic surfactants using Dragendorff reagent.

1 Scope

This part of ISO 7875 specifies a methylene blue spectrometric method for the determination of anionic surfactants in aqueous media.

2 Field of application

This part of ISO 7875 applies to the determination of low concentrations of methylene blue active substances (MBAS), i.e. anionic surface active material, in influents and effluents of sewage plants, waste water, surface water, and drinking water. Under the experimental conditions, sulfonates and sulfates are the compounds chiefly measured, but some positive and negative interferences can occur (see clause 10).

The range of this method is 0,1 to 5,0 mg/l and the limit of detection about 0,05 mg/l for solutions of standard surfactants in distilled water.

3 References

ISO 5667, *Water quality — Sampling —*

Part 2: Guidance on sampling techniques.

*Part 3: Guidance on the preservation and handling of samples.*¹⁾

4 Principle

Formation in an alkaline medium of salts from methylene blue and anionic surfactants. Extraction of these salts with chloroform and acid treatment of the chloroform solution. Elimination of any interferences by extraction of the anionic substance-methylene blue complex from alkaline solutions and shaking with acidic methylene blue solution. Measurement of the absorbance of the separated organic phase at the maximum absorption wavelength of 650 nm. Evaluation by means of a calibration curve. For reasons of purity and stability the preferred standard is dodecyl benzene sulfonic acid methyl ester (tetrapropylene type, relative molecular mass 340), although other surfactants may be used as standards (see the note to 5.11). The calibration standard is prepared from the standard dodecyl benzene sulfonic acid ester after saponification to the sodium salt. Calculation of the MBAS as sodium dodecyl benzene sulfonate (see 9.1).

5 Reagents

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

5.1 Sodium chloride (NaCl).

5.2 Ethyl acetate (C₄H₈O₂), freshly distilled.

CAUTION — Ethyl acetate is flammable and toxic.

5.3 Chloroform (CHCl₃).

CAUTION — Chloroform is a suspected carcinogen.

If necessary [for example, if it gives rise to high results in blank tests (8.2)] purify the chloroform by filtration through Al₂O₃ (neutral grade, W 200).

NOTE — Due to the toxicity of chloroform, it would be desirable to replace it by another solvent. Research work to this end is going on.

1) At present at the stage of draft.