
**Water quality — Determination of benzene
and some derivatives —**

Part 2:
**Method using extraction and gas
chromatography**

*Qualité de l'eau — Détermination du benzène et de certains dérivés
benzéniques —*

Partie 2: Méthode par extraction et chromatographie en phase gazeuse



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 Standard ISO 11423-2 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical, biochemical methods*.

ISO 11423 consists of the following parts, under the general title *Water quality — Determination of benzene and some derivatives*:

- *Part 1: Head-space gas chromatographic method*
- *Part 2: Method using extraction and gas chromatography*

Annexes A, B and C of this part of ISO 11423 are for information only.

© ISO 1997

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

Introduction

This part of ISO 11423 describes an extraction method of sample treatment followed by the gas chromatography for the determination of benzene and derivatives in water.

For a head-space procedure see ISO 11423-1.

Which of these methods is applicable in a given case depends for instance on the type of sample to be analysed and the instruments available to the analyst. The method used is then described in the test report.

This page intentionally left blank

Water quality — Determination of benzene and some derivatives —

Part 2:

Method using extraction and gas chromatography

1 Scope

The method described is applicable to the determination of benzene, methylbenzene (toluene), dimethylbenzenes (xylenes) and ethylbenzene (abbreviated hereafter to BTX) in water and waste water in concentrations above 5 µg/l. High concentrations may be determined by diluting the extract.

A number of further derivatives and nonpolar compounds with similar boiling points may also be determined by this method. The applicability of the methods should be verified in these cases for the particular water sample.

2 Principle

The unfiltered sample is extracted with a nonpolar solvent (e.g. pentane) and the extract is analysed by gas chromatography. Benzene and its derivatives are separated by injection on two capillary columns with stationary phases of different polarity (e.g. by simultaneous splitting) and determined using a suitable detector (for identification of compounds see 7.4).

3 Interferences

Loss of BTX may occur during sampling, transport, storage and preparation of samples due to evaporation and stripping. Other volatile compounds in the ambient air may contaminate water samples and water used for blank tests, leading to high limits of detection and high blank values, respectively.

To avoid errors due to sorption or desorption of constituents, samples should not come into contact with plastics materials.

Surfactants, emulsifiers and higher contents of polar solvents such as propanone or methanol will impair the extraction procedure. Suspended solids affect extraction and recovery.

The presence of a second liquid phase (e.g. mineral oil, volatile organic halogenated hydrocarbons, emulsified grease and waxes) will affect sampling, sample preparation and extraction. Only the content of the aqueous phase would be determined; it is possible, however, to determine the content of the second liquid phase separately. If this is done, it shall be stated in the test report.

Specific problems in the gas chromatographic system shall be handled according to the manufacturer's instructions.

The determination may be hindered by superposition of other hydrocarbons, for instance mineral oil constituents, which may also result in column overload.