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

Part 1:
Head-space gas chromatographic method

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

*Partie 1: Méthode par chromatographie en phase gazeuse de l'espace de
tête*



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 11423-1 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, C and D 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 a head-space method of sample treatment for the gas chromatographic determination of benzene and some of its derivatives in water.

For an extraction procedure followed by gas chromatography, see ISO 11423-2.

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 document is a preview generated by EVS

This document is a preview generated by EVS

This page intentionally left blank

Water quality — Determination of benzene and some derivatives —

Part 1:

Head-space gas chromatographic method

1 Scope

The method described is applicable to the determination of benzene, methylbenzene (toluene), dimethylbenzenes (xylenes) and ethylbenzene (abbreviated hereafter to BTX) in homogeneous samples of water and waste water in concentrations above 2 µg/l. In samples that are organically polluted, the limit of determination may, depending on the matrix of the sample, be higher. High concentrations may be determined by diluting the sample.

A number of further derivatives and nonpolar compounds with similar physical properties may also be determined by this method. The applicability of the method should be verified for the particular water sample.

2 Principle

A defined volume of unfiltered water sample is heated in a gas-tight septum-covered vial. After establishment of equilibrium between the gaseous and liquid phases, an aliquot of the gaseous phase is transferred to a gas chromatograph. Separation of benzene and its derivatives is carried out by injection on two capillary columns with stationary phases of different polarity (e.g. by simultaneous splitting) and determination using a suitable detector (for identification of compounds see 7.3).

3 Interferences

Loss of BTX may occur during sampling, transport storage and preparation of samples due to evaporation and stripping. Volatile organic 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.

Compared with the extraction procedure in ISO 11423-2, interferences due to suspended matter or emulsifiers are less frequent with head-space analysis. Solvents can modify the normal equilibrium with the gaseous phase. The presence of a second liquid phase prohibits the use of the head-space method.

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