

German standard methods for the examination of water, waste water
and sludge**Substance group analysis (group F)**Part 3: Determination of polychlorinated biphenyls (PCBs) by gas
chromatography (F 3)**DIN****38407-3**

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Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlammuntersuchung – Gemeinsam erfassbare
Stoffgruppen (Gruppe F) – Teil 3: Gaschromatographische Bestimmung von polychlorierten Biphenylen (F 3)*In keeping with current practice in standards published by the International Organization for Standardization
(ISO), a comma has been used throughout as the decimal marker.***Contents**

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Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

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Foreword

This standard has been prepared by the *Normenausschuss Wasserwesen* (Water Practice Standards Committee) jointly with Study Group *Wasserchemie* (Water Chemistry) of the *Gesellschaft Deutscher Chemiker* (German Chemists' Society) (cf. Explanatory notes).

Expert assistance and specialised laboratories will be required to perform the analyses specified in this standard.

Depending on the objective of the analysis, a check shall be made on a case-by-case basis as to whether and to what extent additional conditions will have to be specified.

Introduction

Theoretically, there are 209 polychlorinated biphenyl (PCB) compounds. Those encountered in water may have originated from industrial products, or they may be by-products of other chemical processes. Multi-compound PCBs may comprise up to 100 single compounds, each with its own characteristics, while by-products only contain one compound.

After a long residence time in the environment, the composition of a PCB may change due to degradation, physico-chemical factors or mixture with other substances. Therefore, the composition of PCBs encountered in water can vary considerably.

1 Scope

This standard describes the following three methods of determination:

- Method 3-1, for identifying and determining individual PCBs on the lines of DIN 38407-2 (cf. clause 12).
- Method 3-2, to be selected where chromatograms are to be used to gain information on the product(s) from which the PCB originate (cf. clause 13).
- Method 3-3, for detecting PCBs by mass spectroscopy in cases where method 3-1 cannot be used because interferences make identifying the indicator compound difficult, or where method 3-2 is unsuitable because a particular product type cannot be established unambiguously when comparing peaks by means of the similarity index (cf. clause 14),

The method used is to be selected depending on the objective of the investigation. The flowchart in figure 1 is intended as an aid in choosing a suitable method on the basis of an initial chromatogram.

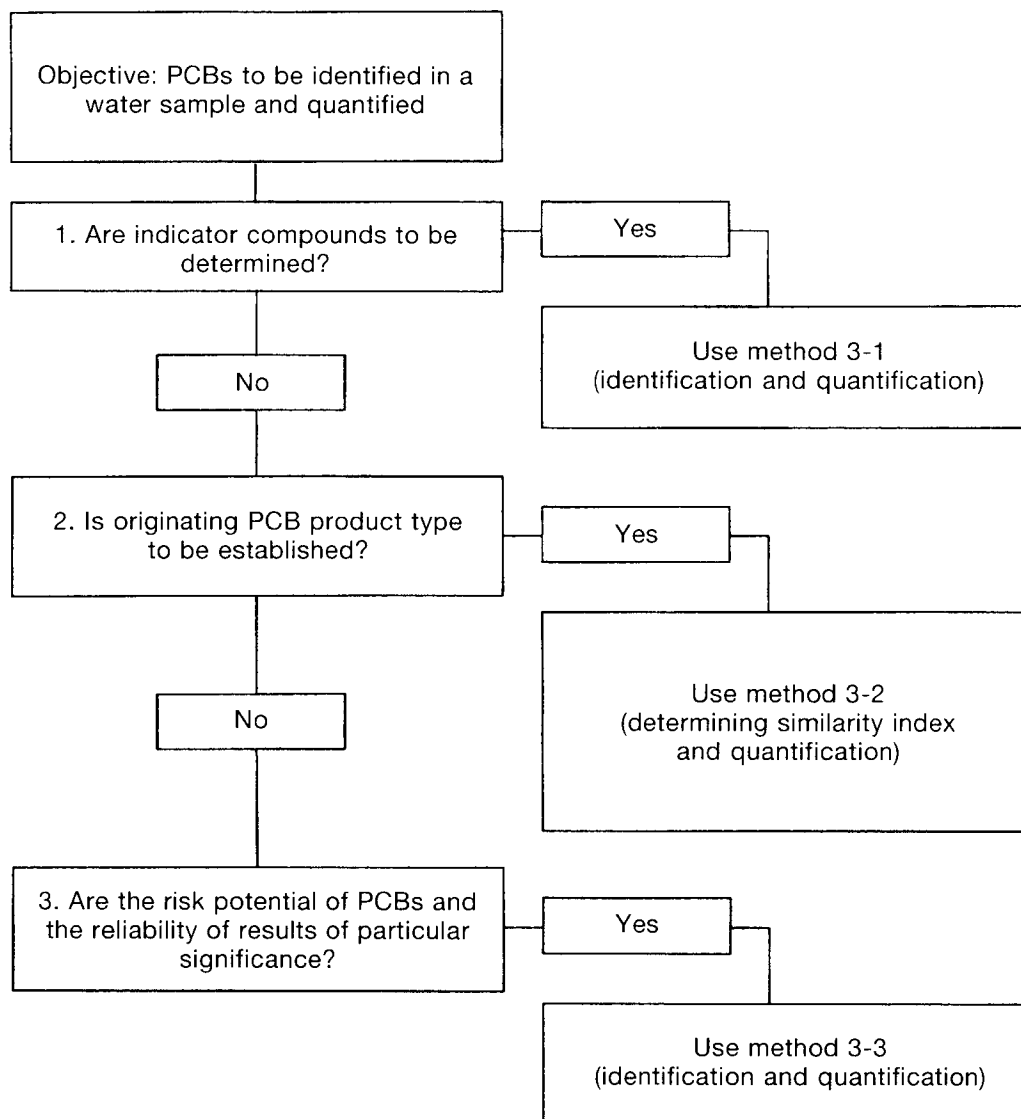


Figure 1: Flowchart illustrating selection of method to be used for identifying and quantifying polychlorinated biphenyls

2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the titles of the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

- DIN 12242-1 Interchangeable conical ground joints on laboratory glassware – Dimensions and tolerances
- DIN 12331 Beakers for laboratory use
- DIN 12387 Conical flasks for laboratory use
- DIN 12451 Separating funnels with interchangeable stopcocks for laboratory use
- DIN 12691 Class AS fast delivery one-mark bulb pipettes, with a waiting time of 15 seconds, for laboratory use
- DIN 38407-2 German standard methods for the examination of water, waste water and sludge – Substance group analysis (group F) – Determination of low-volatility halogenated hydrocarbons by gas chromatography (F 2)
- DIN 51527-1 Determination of polychlorinated biphenyls (PCBs) in petroleum products – Preliminary separation by liquid chromatography and determination of six selected PCBs by gas chromatography using an electron-capture detector (ECD)

Gesetz über Einheiten im Messwesen (German Law on units in metrology), as of 22 February 1985, *BGBI* (German Federal Law Gazette) I, 1985, No. 11, pp. 409 and 410