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Textiles and textile products — Determination of organotin compounds —

Part 1: Derivatisation method using gas chromatography

Textiles et produits textiles — Détermination des composés organostanniques —

Partie 1: Méthode de dérivation utilisant la chromatographie en phase gazeuse

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Foreword

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This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in collaboration with ISO Technical Committee ISO/TC 38, *Textiles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Textiles and textile products — Determination of organotin compounds —

Part 1: Derivatisation method using gas chromatography

WARNING — The use of this document involves hazardous materials. It does not purport to address all of the safety or environmental problems associated with its use. It is the responsibility of users of this document to take appropriate measures to ensure the safety and health of personnel and the environment prior to application of the document.

1 Scope

This document specifies a test method for the qualification and quantification of organotin compounds. This test method is applicable to all types of materials of textile products.

NOTE CEN/TR 16741 defines which materials are applicable to this determination.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4787, *Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

The organotin substances are extracted from the material of a textile product with a methanol-ethanol mixture using tropolone as a complexing agent.

The polar and high-boiling organotin is then converted to the corresponding volatile alkyl derivative, by reaction with sodium tetraethylborate, $NaB(Et)_4$. Finally, it is detected and quantified by using a gas chromatograph fitted with a mass selective detector (GC-MS).

Table 1 indicates the list of target compounds which can be analysed with this document.

This document is also applicable for further organotin substances provided that the method is validated with the additional compounds.

Table 1 — List of target compounds that can be analysed and internal standards

Type of compound	Compound	CAS[a] number
Monosubstituted	Internal standard: n-Heptyltin trichloride	59344–47–7
	Methyltin trichloride	993–16–8
	n-Butyltin trichloride	1118–46–3
	n-Octyltin trichloride	3091–25–6
	Phenyltin trichloride	1124–19–2
Disubstituted	Internal standard: Di-n-heptyltin dichloride	74340–12–8
	Dimethyltin dichloride	753–73–1
	Di-n-propyltin dichloride	867–36–7
	Di-n-butyltin dichloride	683–18–1
	Di-n-octyltin dichloride	3542–36–7
	Diphenyltin dichloride	1135–99–5
Trisubstituted	Internal standard: Tri-n-pentyltin chloride	3342–67–4
	Trimethyltin chloride	1066–45–1
	Tri-n-propyltin chloride	2279–76–7
	Tri-n-butyltin chloride[b]	1461–22–9
	Tri-n-octyltin chloride	2587–76–0
	Triphenyltin chloride (or fentin chloride)	639–58–7
	Tricyclohexyltin chloride	3091–32–5
Tetrasubstituted	Internal standard: Tetra-n-propyltin	2176–98–9
	Tetra-n-ethyltin	597–64–8
	Tetra-n-butyltin	1461–25–2

[a] Chemical Abstract Service.

[b] If bis(tri-n-butyltin)oxide (TBTO), CAS number 56–35–9, is present, it is detected as tri-n-butyltin.

5 Reagents

Unless otherwise specified, use only reagents of recognized analytical grade.

5.1 Water, grade 3 according to ISO 3696.

5.2 Ethanol, technical grade or industrial methylated spirit (IMS), CAS number: 64-17-5.

5.3 Glacial acetic acid, CAS number: 64-19-7.

5.4 Sodium tetraethylborate, CAS number: 15523-24-7.

5.5 Tetrahydrofuran (THF), stabilized, CAS number: 109-99-9.

5.6 n-Heptyltin trichloride, CAS number: 59344-47-7 (internal standard).

5.7 Di-n-heptyltin dichloride, CAS number: 74340-12-8 (internal standard).

5.8 Tri-n-pentyltin chloride, CAS number: 3342-67-4 (internal standard).