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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20385.2-2026

**Textiles - Determination of organotin compounds - Part 2:
Liquid chromatography-tandem mass spectrometry**

纺织品 有机锡化合物的测定 第2部分：液相色谱-串联质谱法

(English Translation)

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Table of Contents

Foreword
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Principles
5 Reagents

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 2 of GB/T 20385 "Determination of Organotin Compounds in Textiles". GB/T 20385 has been published as follows.

Part 2.

---Part 1: Derivatization by Gas Chromatography-Mass Spectrometry;

---Part 2: Liquid Chromatography-Tandem Mass Spectrometry this document is modified to adopt ISO 22744-2:2020 "Textiles and textile products - Determination of organotin compounds - Part 2: Liquid chromatography".

Spectral direct method.

Compared with ISO 22744-2:2020, this document has undergone the following structural adjustments.

---Sections 5.4 to 5.9 correspond to sections 5.2 to 5.6 in ISO 22744-2:2020; sections 5.2 and 5.3 have been added.

---5.9 Table 1 corresponds to Table 1 in Chapter 4 of ISO 22744-2:2020;

---6.5 corresponds to 6.4 in ISO 22744-2:2020; 6.5 in ISO 22744-2:2020 has been deleted; 6.4 and 6.9 have been added.

6.10;

---8.4 corresponds to 8.4.1~8.4.5 in ISO 22744-2:2020; 8.2.1 and 8.2.2 have been added;

---9.2 corresponds to 9.2.1~9.2.5 in ISO 22744-2:2020; 9.3 in ISO 22744-2:2020 has been deleted; 9.4 has been added.

The technical differences between this document and ISO 22744-2:2020, and the reasons therefor, are as follows.

---ISO 4787 (see Chapter 5) has been replaced with the normatively referenced GB/T 6682 to adapt to my country's actual situation and practices;

---The principle of trisubstituted organotin assay has been modified (see Chapter 4). The trisubstituted organotin cation forms a complex with a cycloheptatrienolone ketone.

Ion pairs have higher sensitivity;

---Change "analytical grade" to "chromatographic grade" (see Chapter 5) to reduce interference from impurities in the reagents on the liquid chromatography-tandem mass spectrometry (LC-MS/MS) instrument.

---Two reagents, methyl tert-butyl ether and n-hexane (see Chapter 5), have been added for the revised test procedures;

---Added three organotin compounds. methyltin trichloride, dimethyltin dichloride, and dipropyltin dichloride; removed tri-n-octyl.

Tin chloride (see Chapter 5) improves the accuracy of test results;

---A vacuum rotary evaporator or nitrogen blower concentrator, volumetric flasks, and beakers (see Chapter 6) have been added for the revised experimental procedures;

---Change the graduation value "0.1mg" to "0.1mg and 0.01g" (see 6.1) to facilitate accurate weighing of standards;

---The frequency of the temperature-controlled ultrasonic generator has been increased (see 6.3), and the test parameters have been improved;

---The requirements for the filter membrane have been changed (see 6.5) to reduce the adsorption of organotin compounds by the filter membrane;

---The pipette range has been changed (see 6.6) for the revised test procedure;

---The pipette range has been changed (see 6.7) for the revised test procedure;

---Change the internal standards "di-n-heptyltin dichloride" and "tri-n-propyltin chloride" to "tri-n-pentyltin chloride" (see 5.9) to avoid sample Matrix interference;

---Change "For samples of the same material, a maximum of three samples should be tested together" to "Take a representative sample and cut it into pieces approximately 5mm x 5mm".

Small pieces, each material of each sample needs to be tested individually (see Chapter 7),

individual testing can lower the limit of quantitation;

---The type and weighing method of the internal standard have been changed (see 8.3.2) for the revised test procedure, and a separately configured internal standard reserve has been prepared.

The solution is more convenient to use;

---Change "Internal Standard - Working Solution (Organotin Cation Concentration 2 mg/L)" to "Internal Standard Working Solution (Organotin Cation)" (The concentration of the protons is 20 mg/L) (see 8.3.3) to improve the accuracy of the test results;

---The target compound species for the standard stock solutions have been changed (see 8.3.4), expanding the testing range;

---Change "Add 9.5 mL of extraction buffer (methanol/ethanol mixed solvent) and 0.5 mL of internal standard working solution" to "Transfer 20 mL of..." Add cycloheptatrienolone solution A (8.2.1) to the extraction flask, then add 0.1 mL of internal standard working solution (see 8.4) to lower the sample concentration.

Qualitative interference;

---A concentration step has been added (see 8.4). Concentrating the extract can improve the detection limit, and solvent replacement facilitates liquid chromatography-tandem mass spectrometry.

analyze;

---Change "Standard curve with at least three points" to "Plot calibration curve with at least five calibration points (excluding blanks)" (see...) 9.1), conforming to the requirements of GB/T 27417;

---Change the calculation method to linear fitting (see 9.2) for easier calculation;

---The number of results to retain and the method limit of quantitation (see 9.2 and 9.3) have been increased to align with domestic standards.

The following editorial changes have been made to this document.

---The standard title has been changed to "Determination of Organotin Compounds in Textiles - Part 2: Liquid Chromatography-Tandem Mass Spectrometry";

---The parameters for liquid chromatography and mass spectrometry in Appendix A have been changed;

---The calibration solution preparation example in Appendix B has been revised;

---Appendix C, "Feasibility of this document," has been removed from ISO 22744-2:2020.

Please note that some content in this document may involve patents. The issuing

organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China National Textile and Apparel Council.

This document is under the jurisdiction of the National Technical Committee on Standardization of Textiles (SAC/TC209).

Introduction

GB/T 20385 "Determination of Organotin Compounds in Textiles" consists of two parts according to different test methods.

---Part 1: Derivatization Gas Chromatography-Mass Spectrometry. The purpose is to specify the reagents, instruments, and equipment used in gas chromatography-mass spectrometry.

Requirements related to experimental procedures and result calculation.

---Part 2: Liquid Chromatography-Tandem Mass Spectrometry. The purpose is to specify the reagents, instruments, and equipment used in liquid chromatography-mass spectrometry.

Requirements related to verification procedures and result calculation.

Determination of organotin compounds in textiles Part 2: Liquid Chromatography-Tandem Mass Spectrometry Warning---Personnel using this document should have practical experience working in a formal laboratory. This document does not address all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

This document describes a test method for determining organotin compounds in textile products using liquid chromatography-tandem mass spectrometry (LC-MS/MS).

This document applies to all types of textile products.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories (GB/T 6682-2008, ISO 3696:1987, MOD)