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

GB/T 39560.12-2024

**Determination of certain substances in electrotechnical products - Part 12: Simultaneous
determination of polybrominated biphenyls, polybrominated diphenyl ethers and
phthalates in polymers by gas chromatography-mass spectrometry**

(English Translation)

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions, abbreviations	
4 Principle	
5 Reagents and Materials	
6 Instruments and Equipment	
7 Sample Preparation	
8 Test Step	
9 Analyte Concentration Calculation	
10 Accuracy	11
11 Quality Assurance and Control	12
12 Test report	
Appendix A (Informative) Examples of extraction efficiency of different extractants	
Appendix B (Informative) Examples of extraction efficiency at different cycle times	
Appendix C (Informative) Gas Chromatography Mass Spectrum	
Appendix D (Informative) Mass spectra of each target compound	
Appendix E (Informative) Statistical results of the International Interlaboratory Comparison	12 (IIS12)
Reference	

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 12 of GB/T 39560 "Determination of certain substances in electrical and electronic products". GB/T 39560 has been published the following parts.

- Part 1: Introduction and overview;
- Part 2: Disassembly, and mechanical sample preparation;
- Part 3-1. Screening of lead, mercury, cadmium, total chromium and total bromine by

X-ray fluorescence spectrometry;

--- Part 4: Determination of mercury in polymers, metals and electronic components by CV-AAS, CV-AFS, ICP-OES and ICP-MS;

--- Part 5: Determination of cadmium, lead, chromium and metals in polymers and electronic components by AAS, AFS, ICP-OES and ICP-MS Cadmium and lead content;

--- Part 6: Determination of polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatography-mass spectrometry (GC-MS);

--- Part 7-1. Determination of hexavalent chromium [Cr(VI)] in colorless and colored anti-corrosion coatings on metals by hexavalent chromium colorimetry;

--- Part 7-2. Determination of hexavalent chromium [Cr(VI)] in polymers and electronic components by hexavalent chromium colorimetry;

--- Part 8: Gas chromatography-mass spectrometry (GC-MS) and gas chromatography-mass spectrometry with pyrolysis/thermal desorption (Py/TD-GC-MS) MS determination of phthalates in polymers;

--- Part 12: Simultaneous determination of polybrominated biphenyls, polybrominated diphenyl ethers and phthalates in polymers by gas chromatography-mass spectrometry.

This document is equivalent to IEC 62321-12:2023 "Determination of certain substances in electrical products Part 12: Gas chromatography-mass spectrometry Simultaneous Determination of Polybrominated Biphenyls, Polybrominated Diphenyl Ethers and Phthalates in Polymers.

The following editorial changes were made to this document.

--- In order to be consistent with the existing standard series in my country, the name of the standard is changed to "Determination of Certain Substances in Electrical and Electronic Products Part 12 "Simultaneous determination of polybrominated biphenyls, polybrominated diphenyl ethers and phthalates in polymers by gas chromatography-mass spectrometry";

--- Changed the errata of the original IEC text, changing "using the results of 5 calibration points (according to Table 5)" in 11.2e) to "using 5 calibration points the results of the points (according to Table 6)".

Introduction

GB/T 39560 "Determination of Certain Substances in Electrical and Electronic Products" is a basic and common standard for the control of hazardous substances in electrical and electronic products.

GB/T 39560 is intended to consist of the following parts.

--- Part 1: Introduction and overview. The purpose is to define an introduction and overview of the determination of certain substances in electrical and electronic products.

--- Part 2: Disassembly, splitting and mechanical sample preparation. The purpose is to determine the disassembly, splitting and mechanical sample preparation of certain substances in electronic and electrical products.

and mechanical sample preparation methods.

--- Part 3-1. Screening of lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry. The purpose is to determine the X-ray fluorescence spectroscopy screening method for lead, mercury, cadmium, total chromium and total bromine.

--- Part 3-2. Combustion-ion chromatography (C-IC) screening of fluorine, chlorine and bromine in polymers and electronic components. The purpose is to determine the Screening methods for fluorine, chlorine and bromine in polymers and electronic components in electronic and electrical products.

--- Part 3-3. Screening of polybrominated oligomers in polymers by gas chromatography-mass spectrometry with pyrolysis/thermal desorption (Py/TD-GC-MS) the purpose is to determine the content of polybrominated biphenyls, polybrominated diphenyl ethers and phthalates in polymers in electrical and electronic products.

Screening methods for phenyl ethers and phthalates.

--- Part 3-4. High performance liquid chromatography with ultraviolet detection (HPLC-UV), thin layer chromatography (TLC) and thermal desorption HPLC the purpose is to determine the presence of phthalates in polymers in electronic and electrical products.

Screening methods for phthalates.

--- Part 4: Determination of mercury in polymers, metals and electronic components by CV-AAS, CV-AFS, ICP-OES and ICP-MS. Purpose Aims to determine the method for the determination of mercury in polymers, metals and electronic components in electrical and electronic products.

--- Part 5: Determination of cadmium, lead, chromium and metals in polymers and electronic components by AAS, AFS, ICP-OES and ICP-MS the purpose is to determine the content of cadmium, lead, chromium in polymers and electronic components in electronic and electrical products, as well as cadmium and lead in metals.

Method for determining the content of.

--- Part 6: Determination of polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatography-mass spectrometry (GC-MS).

Method for determination of polybrominated biphenyls and polybrominated diphenyl ethers

in polymers in electrical and electronic products.

--- Part 7-1.Determination of hexavalent chromium [Cr(VI)] in colorless and colored anti-corrosion coatings on metals by hexavalent chromium colorimetry.

Method for determining hexavalent chromium [Cr(VI)] in colorless and colored anti-corrosion coatings on metals in electrical and electronic products.

--- Part 7-2.Determination of hexavalent chromium [Cr(VI)] in polymers and electronic components by hexavalent chromium colorimetry.

Method for determination of hexavalent chromium [Cr(VI)] in polymers and electronic components in electrical products.

--- Part 8: Gas chromatography-mass spectrometry (GC-MS) and gas chromatography-mass spectrometry with pyrolysis/thermal desorption (Py/TD-GC-MS) MS) to determine phthalates in polymers. The purpose is to determine the phthalates in polymers in electronic and electrical products.

Determination method.

--- Part 9: Determination of hexabromocyclododecane in polymers by gas chromatography-mass spectrometry (GC-MS).

Method for determination of hexabromocyclododecane in polymers in products.

--- Part 10: Determination of polycyclic aromatic hydrocarbons (PAHs) in polymers and electronic components by gas chromatography-mass spectrometry (GC-MS).

Determine the method for the determination of polycyclic aromatic hydrocarbons (PAHs) in polymers and electronic components in electrical and electronic products.

--- Part 11: Determination of tri(2-chloroethyl) in polymers by gas chromatography-mass spectrometry (GC-MS) and liquid chromatography-mass spectrometry (LC-MS) the purpose is to determine the content of tris(2-chloroethyl) phosphate (TCEP) in polymers in electronic and electrical products.

Determination method.

--- Part 12: Simultaneous determination of polybrominated biphenyls, polybrominated diphenyl ethers and phthalates by gas chromatography-mass spectrometry.

A technical method suitable for the simultaneous determination of polybrominated biphenyls, polybrominated diphenyl ethers and phthalates in electronic and electrical products.

--- Part 13: Liquid chromatography with diode array detection (LC-DAD), liquid chromatography with mass spectrometry (LC-MS) and liquid chromatography with Determination of bisphenol A (BPA) in polymers by liquid chromatography-mass