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

GB/T 39560.5-2021

**Determination of certain substances in electrical and electronic products - Part 5:
Cadmium, lead and chromium in polymers and electronics and cadmium and
lead in metals by AAS, AFS, ICP-OES and ICP-MS**

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Foreword

GB/T 39560 "Determination of Certain Substances in Electronic and Electrical Products" is divided into the following parts.

---Part 1.Introduction and overview;

---Part 2.Disassembly, 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.CV-AAS, CV-AFS, ICP-OES and ICP-MS determination of mercury in polymers, metals and electronic parts;

---Part 5.AAS, AFS, ICP-OES and ICP-MS methods for the determination of cadmium, lead and chromium in polymers and electronic parts, as well as in metals

The content of cadmium and lead;

---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 in colorless and colored anticorrosive coatings on metals by hexavalent chromium colorimetry [Cr(VI)];

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

---Part 8. Gas Chromatography-Mass Spectrometry (GC-MS) and Gas Chromatography-Mass Spectrometry (Py/T D-GC-

MS) Determination of phthalates in polymers.

This part is Part 5 of GB/T 39560.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

The translation method used in this part is equivalent to the IEC 62321-5:2013

"Determination of Certain Substances in Electrical Products Part 5. AAS,

AFS, ICP-OES and ICP-MS determination of cadmium, lead and chromium in polymers and electronic parts and cadmium and lead in metals".

The Chinese documents that have a consistent correspondence with the international documents cited in this section are as follows.

---GB/T 6682-2008 Analytical laboratory water specifications and test methods (ISO 3696:1987, MOD);

---GB/T 39560.1-2020 Measurement of certain substances in electrical and electronic products Part 1. Introduction and overview (IEC 62321-1.

2013, IDT)

---GB/T 39560.2-2020 Determination of certain substances in electrical and electronic products Part 2. Disassembly, disassembly and mechanical sample preparation

(IEC 62321-2:2013, IDT)

---GB/T 39560.301-2020 Determination of certain substances in electronic and electrical products Part 3-1. X-ray fluorescence spectrometry

Screen lead, mercury, cadmium, total chromium and total bromine (IEC 62321-3-1:2013, IDT)

This section has made the following editorial changes.

---In order to be consistent with China's existing standard series, the standard name is changed to "Determination of Certain Substances in Electrical and Electronic Products, Part 5

Points. AAS, AFS, ICP-OES and ICP-MS methods for the determination of cadmium, lead and chromium in polymers and electronic parts, and cadmium and lead in metals content".

This part is proposed and managed by the National Environmental Standardization Technical Committee for Electrical and Electronic Products and Systems (SAC/TC297).

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Supervision and Inspection Institute.

1 Scope

This part of GB/T 39560 describes the determination of lead and cadmium in polymers, metals and electronic parts by AAS, AFS, ICP-OES and ICP-MS

And chromium method.

This section specifies the determination of cadmium (Cd), lead (Pb) and chromium (Cr) content in electrical and electronic products. It covers three types of substrates.

Polymer/polymer components, metals and alloys, and electronics.

The samples in this section refer to the objects to be processed and tested. The sample and the method of obtaining it shall be determined by the institution implementing the test. For testing electronics

For further guidance on the content of restricted substances in products and how to obtain representative samples from them, see IEC 62321-2. Selection of samples and/or

The measurement may affect the interpretation of the test results.

This section specifies the determination method of cadmium (Cd), lead (Pb) and chromium (Cr) in electronic and electrical products, and introduces the detection of four instruments

Methods (AAS, AFS, ICP-OES, ICP-MS) and several sample chemical pretreatment methods (preparation of sample solution), you can choose from them

The most suitable method.

Since hexavalent chromium in polymers and electronic parts is sometimes difficult to determine, this section describes chromium in polymers and electronic parts other than AFS

Of screening methods. Chromium analysis can provide information on whether hexavalent chromium is present in the material. However, elemental analysis cannot selectively determine hexavalent

Chromium, it measures the total chromium content in the sample. If the total chromium content exceeds the limit of hexavalent chromium, a confirmation test for hexavalent chromium should be carried out.

The ICP-OES and AAS methods described in this section are more than 10mg/kg Pb, Cd and Cr; or the ICP-MS method

Pb and Cd higher than 0.1 mg/kg; or Pb higher than 10 mg/kg determined by AFS method, and Cd higher than 1.5 mg/kg can be obtained.

Good accuracy and precision. These methods can also test higher content samples.

Because of the stability of the material, this section does not apply to samples containing polyfluoropolymers. If sulfuric acid is used in the analysis, keep it

At the risk of Pb loss, an erroneously low analysis value will be obtained. In addition, because it may interfere with the reduction of Cd, sulfuric acid and hydrofluoric acid do not

It is suitable for the determination of Cd by atomic fluorescence spectrometry.

The dissolution process of the sample has limitations and risks. For example, precipitation of the target or other elements may occur. In this case, the residual

The substance should be checked separately or dissolved by other methods, and then combined with the test sample solution.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated reference documents, the latest version (including all amendments) is applicable to this document.

IEC 62321-1 Determination of Certain Substances in Electrical Products Part 1.Introduction and Overview (Determination of Certain Sub-