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

GB/T 23113-2023

Replacing GB/T 23113-2017

**Sample preparation for measurement of mercury level in
discharge lamp
(English Translation)**

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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 replaces GB/T 23113-2017 "Sample Preparation for Detection of Mercury Content in Fluorescent Lamps": Compared with GB/T 23113-2017, except in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- Changed the scope of the file (see Chapter 1, Chapter 1 of the:2017 edition);
- Added a chapter of "Terms and Definitions" (see Chapter 3);
- "Fluorescent lamp" in the document is changed to "discharge lamp" (see Chapter 1, Chapter 4, Chapter 5, Chapter 1, Chapter 3, Chapter:2017 version Chapter 4);
- Changed the general requirements for laboratories (see 5.1, 4:1 of the:2017 version);

- Deleted some unused chemical experimental equipment (see 4.3 of the:2017 version);
- Changed the lighting method of the cold end method (see 5.4:1:1, 4:4:1:1 of the:2017 version);
- Changed the interception method of the lamp [see 5.4:4e), 5:4:4g),:2017 version 4:4:4e), 4:4:4g)];
- Deleted redundant operations [see:2017 version 4:4:1:2h), 4:4:4];
- Changed the filtering requirements (see 5.6, 4:6 of the:2017 version);
- Changed the requirements for analytical testing (see 6.3, 5:3 of the:2017 version):

This document is modified to adopt IEC 62554:2017 "Sample Preparation for Detection of Mercury Content in Fluorescent Lamps":

Compared with IEC 62554:2017, this document has made the following structural adjustments:

- Appendix A corresponds to Appendix B in IEC 62554:2017, and Appendix B corresponds to Appendix A in IEC 62554:2017:

The technical differences between this document and IEC 62554:2017 and their reasons are as follows:

- The scope of the document has been changed (see Chapter 1, Chapter 1 of IEC 62554:2017) to adapt to the actual needs of my country's products;
- Deleted terms and their definitions (see Chapter 3 of IEC 62554:2017), and added terms referencing GB/T 2900.65 (see Chapter 3), to adapt to my country's technical conditions;
- Changed the general requirements for laboratories and replaced ISO/IEC 17025:2005 with GB/T 27025 (see 5.1, IEC 62554: 5:1) of:2017, to adapt to my country's technical conditions;
- Changed the water requirements and replaced ISO 3696:1987 with GB/T 6682 (see 5.2, 5:2 of IEC 62554:2017) to suit in response to my country's technical conditions;
- Deleted some unused chemical experimental equipment (see 5.3 of IEC 62554:2017) to conform to actual operation;
- The lighting method of the cold end method has been changed (see 5.4:1:1, 5:4:1:1 of IEC 62554:2017) to adapt to some pipe walls during ignition Very hot discharge lamps;
- Changed the interception method of the lamp [see 5.4:4e), 5:4:4g), IEC 62554:2017 5:4:4e), 5:4:4g)] to provide more Light tube interception method;
- The usage concentration of nitric acid has been changed [see 5.5:2a), 5:5:2a) of IEC 62554:2017] to ensure safe use;

---Changed the requirements for analytical testing, replacing IEC 62321-4 with GB/T 39560.4 (see 6.3, IEC 62554:2017 6:3), to adapt to my country's technical conditions:

The following editorial changes have been made to this document:

---In order to coordinate with the existing standards, the name of the standard is changed to "Sample Preparation for Detection of Mercury Content in Discharge Lamps";

---Change the permissive clauses in some notes to declarative clauses;

---Changed the upper limit of the cold end method temperature in Note 5:4:1:1;

---Changed the test method in Appendix A:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies procedures for sample preparation and testing for the determination of mercury content in discharge lamps:

This document is applicable to the detection of mercury content (not less than 0.1 mg) in discharge lamps (including fluorescent lamps and ultraviolet lamps): Other mercury-containing discharge lamps refer to use:

This document does not contain all measurement information: Detailed measurement information is described in GB/T 39560.4:

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, the dated quotations for undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document:

GB/T 2900.65 Electrical terminology lighting (GB/T 2900.65-2023, IEC 60050-845:2020, IDT) GB/T 6682 Analytical laboratory water specifications and test methods (GB/T 6682-2008, ISO 3696:1987, MOD) GB/T 27025 General requirements for testing and calibration laboratory capabilities (GB/T 27025-2019, ISO/IEC 17025:2017, IDT) GB/T 39560.4 Determination of certain substances in electronic and electrical products Part 4: CV-AAS, CV-AFS, ICP-OES and Determination of mercury in polymers, metals and electronic parts by ICP-MS (GB/T 39560.4-2021, IEC 62321-4:2013, IDT)

3 Terms and definitions

The terms and definitions defined in GB/T 2900.65 apply to this document:

4 Overview

Mercury in discharge lamps covered by this document is present in the following states:

- a) Gaseous state in the lamp;
- b) liquid metal;
- c) compounds;
- d) Alloys:

Due to the differences in the shape, location, composition and structure of mercury-containing devices, there are various quantitative mercury injection schemes: Although some lamps contain amalgam Mercury is injected in the form of solid amalgam or solid amalgam, but there are also many lamps in which liquid mercury is injected:

Mercury amalgam lamps often have devices that serve as auxiliary amalgams, and the shapes and placement of these devices are very diverse:

See Appendix A for instructions on how to use the cold end method to minimize the loss of vapor mercury when opening the pipe: When the lamp is in working condition, all the mercury in the lamp tube will be rich in Concentrated at the cold end, this will help control mercury recovery:

The procedures in Chapter 5 include methods for collecting liquid mercury, combined mercury, amalgams, and amalgams:

Liquid mercury, combined mercury, amalgam and amalgam are tested to obtain the total mercury content: