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PEOPLE'S REPUBLIC OF CHINA**

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**Radiation protection instrumentation - System of spectral  
identification of liquids in transparent and semitransparent  
containers(Raman systems)**

辐射防护仪器 透明和半透明容器中液体光谱识别系统（拉曼系统）

**(English Translation)**

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## 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 is required.

This document is modified to adopt IEC 63085:2021 "Spectral identification system for liquids in transparent and translucent containers of radiation protection instruments (Raman system)".

This document has made the following structural adjustments compared to IEC 63085:2021.

4.2.2.1 and 4.2.2.2 correspond to 4.2.2 a) and 4.2.2 b) in IEC 63085:2021 respectively; -4.2.3.1~4.2.3.5 correspond to 4.2.3 a)~4.2.3 e) in IEC 63085:2021 respectively. -the technical differences between this document and IEC 63085:2021 and their reasons are as follows.

Adjust the contents that are not within the scope of application to the notes (see Chapter 1) to adapt to my country's technical conditions and provide operability.

GB/T 7247.4-2016 (see 4.4) replaces IEC 60825-4:2006 (including AMD1.2008, AMD2.2011) to adapt to my country's technical conditions and provide operability.

The normative references to European Pharmacopoeia 8.7.2016 (see 4.3.7.2 in IEC 60825-4:2011) have been deleted.

Information on the Raman spectrum, peak position, and intensity of cyclohexane is given in ASTM E1840-96:2022.

The test condition requirements have been changed (see 4.3.1.1), and the temperature range in the standard test conditions has been expanded to be more suitable for domestic applications.

scene.

The test condition requirements have been changed (see Table 2), and the test of sample 3 distilled water in IEC 63085:2021 has been deleted.

Using 785 nm and 1 064 nm lasers, the Raman spectrum of water ranges from 3 130 cm<sup>-1</sup> to 3 570 cm<sup>-1</sup>, which is similar to the Raman spectrum used in China.

There are obvious differences in the scope, and water is a safe product. Deleting sample 3 is more suitable for domestic application scenarios; at the same time, the corresponding specifications are deleted.

Normative references ISO 3696:1987.

Changed the spectral range requirement from 300 cm<sup>-1</sup> to 3 600 cm<sup>-1</sup> to 300 cm<sup>-1</sup> to 2 500 cm<sup>-1</sup> (see 4.3.6), 785 nm and 1 064 nm lasers are commonly used in China, and the changes are adapted to domestic application scenarios.

The test method for the repeatability of the identification results has been changed, and the RRF calculation method has been changed (see 4.3.7.2). Domestic Raman systems usually the use of 785 nm and 1 064 nm lasers is more suitable for domestic application scenarios.

Changed the main power supply stability requirement from "3 Hz" to "1 Hz" (see 4.5.2.1) to match domestic power supply conditions. -the following editorial changes were made to this document.

Corrected the content not specified in IEC 63085:2021 and deleted "Packaging, transportation and storage conditions" in the scope; -Correct "1.1 or 1.3 in Table 1" to "3.1 or 3.3 in Table 3" (see 4.8.2.1.1); correct "Table 2.1" to "Table 4" (see 4.8.2.1.2).

## 1 Scope

This document specifies the technical performance requirements, test procedures and procedures for the spectral identification system for liquids in transparent and translucent containers (hereinafter referred to as the "system").

Methods, operational performance requirements and identification and documentation. The system is based on the method of inelastic (Raman) light scattering of molecules.

This document is applicable to fixed or handheld systems.

NOTE 1 The tests mentioned in this document do not involve system geometric parameters and mass parameters (weight).

This document applies to substance identification test standards and system verification, approval and operating procedures.

This document is applicable to the validation of Raman analyzers with functions such as safety screening of dangerous goods, inspection of medical solutions, and liquid chemicals.

NOTE 2 This document considers only the functionality of the Raman analyser and its ability to identify single or multi-component liquids.

## 2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies.

in this document.

GB/T 156-2017 Standard Voltage (IEC 60038:2009, MOD) Note. There is no technical difference between the referenced content of GB/T 156-2017 and the referenced content of IEC 60038:2009.

GB/T 2423.1-2008 Environmental testing for electric and electronic products Part 2: Test methods Test A. Low temperature (IEC 60068-2-1:2007, IDT GB/T 2423.2-2008 Environmental testing for electric and electronic products Part 2: Test methods Test B. High temperature (IEC 60068-2-2:2007, IDT GB/T 2423.3-2016 Environmental testing Part 2: Test method Test Cab. Steady state damp heat test (IEC 60068-2-78:2012, IDT GB/T

2423.10-2019 Environmental testing Part 2: Test methods Test Fc. Vibration (sinusoidal) (IEC 60068-2-6:2007, IDT GB/T 7247.4-2016 Safety of Laser Products Part 4: Laser Protection Screens (IEC 60825-4:2011, IDT) GB 17799.3-2023 General standard for electromagnetic compatibility Part 3: Emissions of equipment in residential environments (IEC 61000-6-3.

2020, IDT)

GB/T 21299-2015 Tolerances for glass containers and bottles (ISO 9058:2008, MOD) Note. There is no technical difference between the referenced content of GB/T 21299-2015 and the referenced content of ISO 9058:2008.

IEC 61000-6-1:2016 Electromagnetic compatibility Part 6-1.Generic standard Immunity for residential, commercial and light industrial environments [Electromagnetic compatibility (EMC)-Part 6-1.Generic standards-Immunity standard for residential, commercial and light-industrial environments] Note. GB/T 17799.1-2017 General standard for electromagnetic compatibility - Immunity for residential, commercial and light industrial environments (IEC 61000-6-1:2005, MOD) ASTM D3695-95:2013 Standard Test Method for Volatile Alcohols in Water by Direct Water Intake Gas Chromatography Test Method for Volatile Alcohols in Water by Direct Aqueous-Injection Gas Chromatography) ASTM D5309-16 Standard Specification for Cyclohexane 999 ASTM E1094-04:2021 Standard Specification for Pharmaceutical Glass Measuring Cups Glass Graduates