ICS 31.030
CCS L 90

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 46135.3-2025

Test methods for organic luminescence electronic and hole function material - Part 3: Purity

有机发光电子/空穴功能材料测试方法 第3部分：纯度

Issued on: October 5, 2025 **Implemented on: May 1, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

Table of Contents

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 3 of GB/T 46135, "Test Methods for Organic Light-Emitting Electron/Hole Functional Materials". GB/T 46135 has been issued. The following parts were laid out.

1.Thermal Properties;

2.Optical Properties;

3.Purity. 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 and is under the jurisdiction of the National Technical Committee on Standardization of Semiconductor Equipment and Materials (SAC/TC203). This document was drafted by: Jilin OLED Optoelectronic Materials Co., Ltd., China Electronics Technology Standardization Institute, and Guangdong Agreya. Optoelectronic Materials Co., Ltd., Beijing Dingcai Technology Co., Ltd., Nanjing Gaoguang Semiconductor Materials Co., Ltd., TCL Huaxing Optoelectronics Technology Co., Ltd. Company, Sichuan Agre New Materials Co., Ltd., Hefei Dingcai Technology Co., Ltd., Anhui Xiulang New Materials Technology Co., Ltd., Shaanxi Light Optoelectronics Materials Co., Ltd., and Dongguan Fu'an Optoelectronics Technology Co., Ltd. The main drafters of this document are. Sun Feng, Ma Xiaoyu, Wu Yiran, Pan Tonghen, Zhao Junsha, Xu Weiwei, Li He, Feng Yanli, Wang Tie, and Cao Kewei. Qian Chao, Gu Xin, Gao Yaoxiang, Shi Zeyuan, Xu Xuanzong, Zhang Baoshuai, Dai Lei, Huang Xinxin, Liu Riming, Shui Xinfeng, Quan Xinjian, Peng Feng, Chen Jingsheng.

Organic light-emitting diodes (OLEDs) are a type of self-emissive display technology. Their core principle is that an organic material layer emits light directly when electricity is applied. It boasts numerous advantages, including ultra-thinness, ultra-wide viewing angle, flexibility, high color gamut, and transparency. Organic light-emitting electron/hole functional materials

are organic material layers. One of the core components, it plays a key role in organic light-emitting displays. Purity (content of main substance, content of metallic elements, halogen content), melting point, glass transition temperature, thermal stability, ultraviolet-visible absorption light Spectroscopy, fluorescence spectrum, phosphorescence spectrum, and the refractive index and extinction coefficient, chromaticity, brightness, luminous efficiency, and luminance of the prepared organic light-emitting diodes. Aging is a crucial indicator for organic light-emitting electron/hole functional materials, and these indicators are vital for controlling production processes and improving product quality. Therefore, it is necessary to establish testing methods for organic light-emitting electron/hole functional materials. GB/T 46135 aims to provide test methods for various properties of organic light-emitting electron/hole functional materials, and is proposed to consist of three parts.

1.Thermal Properties. The aim is to provide a testing method for the thermal properties of organic light-emitting electron/hole functional materials.

2.Optical Properties. The aim is to provide testing methods for the optics of organic light-emitting electron/hole functional materials.

3.Purity. The aim is to provide a method for testing the purity of organic light-emitting electron/hole functional materials. Test methods for organic light-emitting electron/hole functional materials Part

1 Scope

GB/T 46135.3-2025 is the Chinese national standard covering purity of an OLED material - the chromatographic assay and the impurities identified, the residual metals from the synthesis and the residual solvent, at the levels where a few parts per million shorten the life of the display measurably. Part 3 of the series, first edition. In force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document describes the testing methods for the purity of electron/hole functional materials, mainly including the content of the main substance and gold content of the electron/hole functional materials. Methods for testing elements (lithium, magnesium, potassium, calcium, chromium, iron, nickel, copper, palladium, silver, tin, barium, etc.) and halogen elements (fluorine, chlorine, bromine). This document applies to the research, development, production, application verification, testing and inspection, and industry regulation of electron/hole functional materials for various organic light-emitting displays. Reason, etc.

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 6679 General Rules for Sampling of Solid Chemical Products

GB/T 9008 Terminology for Liquid Chromatography

GB/T 16631 General Rules for High Performance Liquid Chromatography

GB/T 25915.1-2021 Cleanrooms and related controlled environments - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 16631 and GB/T 9008 apply to this document.

4 Main substance content

4.1 Principle A solution of electron/hole functional materials at a specific concentration is prepared, and the sample is injected automatically or manually. High-performance liquid chromatography (HPLC) is typically used. Using a UV-Vis detector, electron/hole functional materials are separated by the chromatographic column, and then converted based on their inherent properties by the detector. The signal is converted into an electrical signal, which is then amplified and digitized before being used in a data processing system to generate a corresponding chromatogram. The chromatogram is then analyzed according to integration rules. All peaks were integrated, and the proportion of the main substance's peak area to the total peak area was calculated using the area percentage method. The ratio refers to the content of the main substance of the analyte in the sample.

4.2 Water and Solvents

4.2.1 Water The water should have a resistivity of not less than

18.2 MOmega·cm, and the water and reagents should not interfere with the analysis.

4.2.2 Solvent The solvent should be chromatographic grade or better and should not interfere with the performance of the detector used. Commonly used solvents include methanol, tetrahydrofuran, and acetonitrile.