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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 46135.1-2025

Test methods for organic luminescence electronic and hole function material - Part 1: Thermal property

有机发光电子/空穴功能材料测试方法 第1部分：热学性能

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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 is Part 1 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 Beijing Dingcai Technology. Limited Liability Company, Guangdong Agreya Optoelectronic Materials Co., Ltd., Gu'an Dingcai Technology Co., Ltd., Changchun Haipuruns Technology Co., Ltd. TCL CSOT Technology Co., Ltd., Jiangsu Sanyue Technology Co., Ltd., Nanjing Gaoguang Semiconductor Materials Co., Ltd., Sichuan Agrey New Materials Co., Ltd. The main drafters of this document are. Sun Feng, Ma Xiaoyu, Wu Yiran, Jia Xiaoqin, Li He, Zhao Junsha, Pan Tonghen, Feng Yanli, Guo Jianhua, and Wang Tie. Gao Yaoxiang, Cao Kewei, Xu Xuanzong, Dai Lei, Shi Zeyuan, Gao Xuefeng, Liu Riming, Li Chong, Qian Chao, Zhang Baoshuai, Gao Xuefeng, Zhuang Jianhong.

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 46135.1-2025 is the Chinese national standard covering the thermal behaviour of an OLED transport material - the glass transition temperature that limits how hot the device may run, the decomposition temperature that limits how it can be evaporated, and the sublimation behaviour during deposition. Part 1 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 melting point, glass transition temperature, and thermal stability of organic light-emitting electron/hole functional materials. This document applies to the research, development, production, application verification, testing, and inspection of various organic light-emitting display electron/hole functional materials.

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 27761 Test methods for weight loss and residue in thermogravimetric analyzers

3 Terms and Definitions

The terms and definitions defined in GB/T 27761, as well as the following terms and definitions, apply to this document.

3.1 melting point Tm The temperature at which the solid and liquid phases of a solid compound are in equilibrium under one atmosphere of pressure, at which point the vapor pressures of the solid and liquid phases are equal.

Note. This also refers to the temperature at which a substance changes from a solid to a liquid state.

3.2 Tg The temperature at which an amorphous or semi-crystalline polymer transitions from a glassy state to a rubbery state.

4 Melting point

4.1 Principle Under specified atmosphere and programmed temperature control, the difference in heat flow rate (thermal power) input to the sample and reference sample was measured as a function of temperature or time. The relationship between these changes, plotted with temperature or time on the X-axis and the difference in heat flux rate or heat power on the Y-axis, is known as differential scanning calorimetry. (DSC) curve.

4.2 Instruments

4.2.1 Differential scanning calorimeter.

4.2.2 Analytical balance (accuracy

0.1 mg).

4.3 Environmental Conditions

4.3.1 Ambient temperature. 15°C~30°C.