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

GB/T 46178-2025

Electronic grade tetrakis(dimethylamido)titanium

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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. 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: Nanjing University Optoelectronic Semiconductor Materials Co., Ltd., China Electronics Technology Standardization Institute, Suzhou Laboratory, Jiangsu Nan Large Optoelectronic Materials Co., Ltd., Yangtze Memory Technologies Co., Ltd., Semiconductor Manufacturing International Corporation (Beijing) Co., Ltd., Suzhou Yuanzhan Materials Technology Co., Ltd., Anhui Yagesheng Electronic New Materials Co., Ltd., Qianjiao Nanda Optoelectronic Materials Co., Ltd., Ningbo Nanda Optoelectronic Materials Co., Ltd., Anhui Botai Electronic Materials Co., Ltd., Hefei Andekeming Semiconductor Technology Co., Ltd., Nanjing University Optoelectronics (Ulanqab) Cloth) Co., Ltd., and Nanda Optoelectronics (Zibo) Co., Ltd. The main drafters of this document are: Chen Deyi, Cao Kewei, Mao Bingrong, Xu Wentao, Lu Ping, Shi Zeyuan, Sun Minglu, Sun Peng, Chen Pengyu, and Xuan Zongliang. Zhang Ting, Zhang Jian, Gao Zhou, Gao Peng, Lu Zheng, Guo Wei, Zhao Junsha, Wu Yiran, Wei Liangjie, Mao Guoyu, Lou Xiabing, Wang Xiaoliang, Wang Haiyan, He Xiaochen, Liu Liwei, Zhang Ruzhi, Sun Lili, Cao Yining, Zhang Baoshuai, Ma Desen, Wang Bowen, Peng Yuanbing, Liu Nengqiao, Meng Qingdian, Sun Jian, Li Xue, Yao Meng Hua Shuya. Electronic grade tetra(dimethylamino)titanium

1 Scope

GB/T 46178-2025 is the Chinese national standard covering TDMAT at semiconductor purity - the assay and the trace metals in parts per billion, the moisture and the particles, and the handling of an air-sensitive precursor used to deposit titanium nitride barriers by atomic layer deposition. First edition, with the tantalum precursor standard GB/T 46191-2025. In force from 1 May 2026. Issued on 5 October 2025, it has been in force since

1 May 2026.

This document specifies the technical requirements, inspection rules, packaging, marking, and accompanying documentation for electronic-grade tetra(dimethylamino)titanium used in the semiconductor industry. The requirements for transportation, storage, and safety information are described, along with the corresponding testing methods. This document applies to electronic-grade tetra(dimethylamino)titanium for depositing titanium-based thin films such as titanium nitride, titanium oxide, titanium carbide, and titanium dopants.

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 190 Packaging Marks for Dangerous Goods

GB/T 3723 General Safety Rules for Sampling of Industrial Chemical Products

GB/T 6680 General Rules for Sampling of Liquid Chemical Products

GB/T 11446.1 Electronic Grade Water

GB 12463 General Technical Requirements for Transport Packaging of Dangerous Goods

GB 15258 Regulations for Writing Safety Labels for Chemicals

GB 15603 General Rules for Storage of Hazardous Chemicals in Warehouses

GB/T 16483-2008 Contents and Item Order of Safety Data Sheets for Chemicals

GB/T 17519-2013 Guidelines for the Preparation of Safety Data Sheets for Chemicals

GB/T 25915.1 Cleanrooms and related controlled environments - Part

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4. Technical Requirements Electronic grade tetra(dimethylamino)titanium should conform to the specifications in Table 1. Table

1 Technical Specifications of Electronic Grade Tetra(dimethylamino)titanium for Integrated Circuits Project technical specifications Tetra-(dimethylamino)titanium organic purity (Assay)(Ti(NC₂H₆)₄)/% $\geq$

99.5 Elemental impurity content Aluminum (Al) content ($\mu\text{g/kg}$) $\leq$