

ICS 71.100.20

CCS G 86



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

GB/T 46173-2025

Electronic gas - Noble gas

电子气体 惰性稀有气体

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

1.Scope	1
2 Normative References	1
3.Terms and Definitions	1
4.Technical Requirements 2 5 sampling	3
6.Test Methods	3
6.1 Purity of inert rare gases	4
6.3 Determination of non-methane total hydrocarbon content in krypton	6
6.4 Determination of Helium Content in Neon	7
6.5 Determination of the content of hydrogen, oxygen, argon, nitrogen, carbon monoxide, carbon dioxide, and methane in neon	7
6.6 Determination of total hydrocarbon content in neon	8
6.7 Contents of hydrogen, oxygen, argon, nitrogen, carbon monoxide, carbon dioxide, methane, krypton, carbon tetrafluoride, hexafluoroethane, and sulfur hexafluoride in xenon. The determination of	8
6.8 Determination of non-methane total hydrocarbon content in xenon	9
6.9 Determination of Nitric Oxide, Nitric Oxide and Nitrous Oxide Contents in Xenon	9
6.10 Determination of Moisture Content	11
6.11 Exhaust Gas Treatment	11
7.Inspection Rule	11
8.Marking, Packaging, Transport, Storage and Safety Information	11
8.1 Mark	11
8.2 Packaging, Transportation and Storage	11
18 Reference	19

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: Southwest Branch of Haohua Gas Co., Ltd., Quzhou Hangyang Special Gases Co., Ltd.,

and Huace Testing & Certification Group. Joint-stock company, Henan Xinlianxin Cryogenic Energy Co., Ltd., Fujian Detianchen New Material Technology Co., Ltd., Hubei Heyuan Gas Co., Ltd. Co., Ltd., Beijing Control Engineering Research Institute, Hebei Handan Iron & Steel Special Gases Co., Ltd., Dalian Huabang Chemical Co., Ltd., Guangdong Huatai Gas Joint-stock company, Sinopec (Beijing) Chemical Research Institute Co., Ltd., Chongqing Ruixin Gas Co., Ltd., Beijing PURE Analytical Instruments Co., Ltd. Company, Shenzhen Jiegong Technology Co., Ltd., Three Gorges Public Inspection and Testing Center, China Shipbuilding (Handan) Parry Special Gases Co., Ltd., Fujian Hengshen Electronic Materials Technology Co., Ltd., Beijing Shougang Gas Co., Ltd., National Institute of Metrology, China, Bruker (Beijing) Technology Co., Ltd. Company, CNOOC Energy Development Co., Ltd. Safety and Environmental Protection Branch, Zhonghao Guangming Chemical Research and Design Institute Co., Ltd., Zhejiang Hongxin Semiconductor Co., Ltd., Zhejiang Provincial Chemical Research Institute Co., Ltd., Shanghai Huaai Chromatography Analysis Technology Co., Ltd., Dalian Date Gas Co., Ltd. Hangzhou New Century Mixed Gas Co., Ltd., China Jiliang University, China Metrology and Testing Society, Lianxiong Investment (Shanghai) Co., Ltd., Kunming Guangrui Datong Special Gases Co., Ltd., Superspectrum Technology (Chengdu) Co., Ltd., Shanghai Fanwei Instrument Equipment Co., Ltd., and Shenyang Zhongfu Kejin Pressure Container Co., Ltd., Air Liquide (China) Investment Co., Ltd., AGC Instruments Ltd. (Ireland) Beijing Representative Office, Suzhou Yivite New Materials Co., Ltd. Materials Co., Ltd., Guizhou Provincial Institute of Product Quality Inspection and Testing, Langxi Instruments (Shanghai) Co., Ltd., and Southwest Chemical Research and Design Institute Co., Ltd. The main drafters of this document are. Hu Ying, Wang Han, Chen Guilin, Guo Yingge, Cui Zengtao, Qi Ruijia, Cao Suying, Pan Zhenhuan, Jiang Luo, Fang Qiang, and Song Fei. Fan Chao, Ma Weidong, Chen Libin, Hou Peng, Qian Ji, Fu Zhuhong, Chen Yanshan, Wu Changjiang, Hou Xiuhua, Wei Xin, Jiang Yuejun, Jin Xingyi, Shi Lan, Liu Junhang Wang Lu, Xie Lei, Teng Xinsheng, Zheng Yangguang, Ma Binqi, Liao Hongchang, Zhao Guangming, Li Xiao, Yin Dongmei, Wang Man, Zhao Yue, Cai Changqing, Sun Funan, Wang Feihua Lan Feng, Wu Ningjie, Zhang Qiyang, Fang Hua, Zheng Xinrui, Cheng Xin, Zhang Jinbo, Zhang Jing, Yang Yangzhongfu, Huang Hui, Gao Jing, Qu Qiang, He Bo, Huang Xiaoqiang Fang Song, Yin Hao, Li Ming, Gong Bing, Ren Xihui, Tan Yiqiang, Yin Lele, Li Jianhao, Cheng Huapeng, Zhou Pengyun, Tang Xiamei. Electron gas, inert rare gas

1 Scope

GB/T 46173-2025 is the Chinese national standard covering the noble gases at semiconductor grade - the purity and the impurity limits for the other noble gases, oxygen, nitrogen, moisture and hydrocarbons, the analytical methods able to see them, and the cylinder and delivery requirements. First edition, and it belongs with the helium grades standard GB/T 4844-2025. 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 for inert rare gases, describes the corresponding test methods, and also specifies sampling, inspection rules, and marking procedures. Packaging, transportation and storage requirements are provided, along with safety information. This document applies to inert rare gases obtained by purification from industrial inert rare gases.

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 4842 Argon

GB/T 4844 Pure Helium, High-Purity Helium and Ultra-Purity Helium

GB/T 5099 (all parts) Seamless steel gas cylinders

GB/T 5275.7 Gas analysis - Preparation of calibration mixed gases by dynamic volumetric method - Part

3 Terms and Definitions

The following terms and definitions apply to this document.

7 Thermal mass flow controller

GB/T 5828 Pure Xenon, High-Purity Xenon and Ultra-Purity Xenon

GB/T 5829 Pure Krypton, High-Purity Krypton, and Ultra-Purity Krypton

GB/T 5832.1 Gas analysis - Determination of trace moisture - Part