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

GB/T 28726-2025

Replacing GB/T 28726-2012

**Gas analysis - Gas chromatography with helium ionization
detector**

气体分析 氦离子化气相色谱法

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Standardization Administration of the PRC**

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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 supersedes GB/T 28726-2012 "Gas Analysis - Helium Ionization Gas Chromatography" and is consistent with GB/T 28726-2012. Compared to previous versions, aside from structural adjustments and editorial changes, the main technical changes are as follows:

- The scope has been changed (see Chapter 1, Chapter 1 of the.2012 edition);
- Terminology and definitions have been changed (see Chapter 3, Chapter 3 of the.2012 edition);
- The principles have been changed (see Chapter 4, Chapter 4 of the.2012 edition);
- Requirements for test conditions have been added (see Chapter 5);
- The requirements for reagents and materials have been changed (see Chapter 6, 6.2 of the.2012 edition);
- The requirements for instruments and equipment have been changed (see Chapter 7, Chapter 5 of the.2012 edition);
- The sampling requirements have been changed (see Chapter 8, 6.1 of the.2012 edition);
- The requirements for the test procedures have been changed (see Chapter 9, 6.3 of the.2012 edition);
- The requirement for notes has been removed (see Chapter 7 of the.2012 edition);

1 Scope

GB/T 28726-2025 is the Chinese national standard covering the helium ionization detector - the technique that measures permanent gas impurities at parts per billion where a thermal

conductivity detector sees nothing, with the carrier purity it demands, the calibration and the interferences. It is the method behind the ultra pure gas specifications. Issued on 31 October 2025, it has been in force since 1 May 2026, replacing GB/T 28726-2012.

This document describes the principle, experimental conditions, and reagents for determining trace and ultra-trace components in gases using helium ionization gas chromatography. Related to materials, instruments and equipment, sampling, test procedures, precision and measurement uncertainty, quality assurance and control, and test reports. This document applies to the determination of trace and ultra-trace gaseous components. Trace and ultra-trace amounts of hydrogen, oxygen, nitrogen, methane, carbon monoxide, and carbon dioxide. The carbon fraction was measured in the range of 10×10^{-9} (mole fraction) to 500×10^{-6} (mole fraction).

2 Applied statistics

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

GB/T 4946 Gas Chromatography Terminology

GB/T 14850 Glossary of Gas Analysis

GB/T 43306 Sampling Guidelines for Gas Analysis

GB/T 45133 Gas Analysis - Determination of Composition of Gas Mixtures - Comparative Method Based on Single-Point and Two-Point Calibration

3 Terms and Definitions

The terms and definitions defined in GB/T 3358.2, GB/T 4946, GB/T 14850 and GB/T 43306 apply to this document.

4.Principles Under specific chromatographic conditions, the analyte in the sample is separated by a chromatographic column and then enters a helium ionization detector to collect the analyte. The number is quantified using the external standard method.

5.Test conditions The operating environment should meet the following requirements.

---Temperature. $5^{\circ}\text{C}\sim 40^{\circ}\text{C}$;

---Relative humidity. $20\%\sim 85\%$;

---There is no strong electromagnetic interference, no corrosive gases, and no strong vibrations in the surrounding area;

---Power supply. AC voltage $(220\pm 22)\text{V}$, frequency $(50\pm 0.5)\text{Hz}$;

---Grounding requirements. The instrument must be reliably grounded (grounding resistance $\leq 40\Omega$).