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

GB/T 31987-2026

Replacing GB/T 31987-2015

Electronic gas - Germane

电子气体 锗烷

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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 replaces GB/T 31987-2015 "Germanane for Electronic Industry". Compared with GB/T 31987-2015, except for structural adjustments... Aside from integration and editorial changes, the main technical changes are as follows:

- a) The scope has been changed (see Chapter 1, Chapter 1 of the.2015 edition);
- b) The technical requirements for germane have been revised (see Chapter 4, Chapter 3 of the.2015 edition);
- c) The sampling requirements have been changed (see Chapter 5, 4.1.2 of the.2015 edition);
- d) The method for calculating purity has been changed (see 6.1, 4.2 of the.2015 edition);
- e) The methods for determining the content of hydrogen, oxygen, argon, nitrogen, carbon monoxide, carbon dioxide, and methane have been revised (see 6.2, 4.4 of the.2015 edition);
- f) The method for determining moisture content has been changed (see 6.3, 4.5 in the.2015 edition);
- g) A method for determining the content of metallic elements has been added (see 6.4);

h) The inspection rules have been changed (see Chapter 7,

6.1 Germanane purity

6.1.1 Total impurity content The total impurity content is calculated according to formula (1).

6.1.2 Purity The purity of germane is calculated according to formula (2).

6.2 Determination of the contents of hydrogen, oxygen, argon, nitrogen, carbon monoxide, carbon dioxide, and methane

6.2.1 Determination Method The content of hydrogen, oxygen, argon, nitrogen, carbon monoxide, carbon dioxide, and methane in germanane should be determined according to the method specified in GB/T 28726. This method can be used... The equivalent method shall be used for determination. In case of any dispute over the determination results, the method specified in GB/T 28726 shall be the arbitration method.

6.2.2 Pre-separation column

6.2.2.1 Pre-separation column I. A stainless steel tube 0.6m long and 2mm inner diameter, filled with carbon molecules with a particle size of 0.18mm~0.25mm. Sieve, or other equivalent chromatographic columns.

6.2.2.2 Pre-separation column II. A 3m long stainless steel tube with an inner diameter of 2mm, filled with polymer particles with a particle size of 0.18mm~0.25mm. (a copolymer of ethylstyrene and divinylbenzene), or other equivalent chromatographic columns.

6.2.3 Chromatographic column

6.2.3.1 Column I. A stainless steel tube 1.5m long and 3mm inner diameter, packed with 5A molecules with a particle size of 0.18mm~0.25mm. A sieve, or other equivalent chromatographic column. This column is used to determine the content of hydrogen, oxygen, argon, nitrogen, carbon monoxide, and methane.

6.2.3.2 Chromatographic column II. a 3m long stainless steel tube with an inner diameter of 2mm, packed with polymer particles with a particle size of 0.18mm~0.25mm. (A copolymer of ethylstyrene and divinylbenzene), or other equivalent chromatographic columns. This column is used to determine carbon dioxide content.

6.2.4 Standard Samples The hydrogen content in the standard sample should be similar to that in the sample being tested, and the content (mole fraction) of other components should be between 1×10^{-6} and 5×10^{-6} .

6. The balance gas is high-purity helium and should comply with the requirements of GB/T 4844.

6.2.5 Referenced Gas Flow Diagram The reference gas path flow diagram is shown in

Appendix A.

6.3 Determination of Moisture Content The determination shall be made according to GB/T 5832.1 or GB/T 5832.2 or other equivalent methods. In case of any dispute regarding the determination results, GB/T 5832.2 shall prevail. The prescribed method is arbitration.

6.4 Determination of Metal Element Content Perform in accordance with the provisions of GB/T 34972.

6.5 Exhaust Gas Treatment During the measurement, exhaust gas treatment measures should be in place to prevent germane from polluting the environment.

7 Inspection Rules

Germanane products should be inspected and accepted one by one. The product is deemed qualified if all inspection results meet the specified technical requirements. If any indicator fails to meet the technical requirements, the product is deemed unqualified.

8.1 Marking

8.1.1 Germanane shall be accompanied by a product quality certificate upon leaving the factory, the contents of which shall include at least.

---Product name, manufacturer's name, hazardous chemical production license number;

---Production date or batch number, and shelf life;

---Fill weight (kg);

---This document number and the purity of germane.

8.1.2 The packaging container should be marked with the words "Electronic Gas Germanane".

8.1.3 The packaging markings for germane shall comply with the provisions of GB 190, the color markings shall comply with the provisions of GB/T 7144, and the label shall comply with... The provisions of GB 15258 and GB/T 16804.

8.2 Packaging, Transportation and Storage

8.2.1 The gas cylinders containing germane shall comply with the provisions of GB/T 5099 (all parts) or GB/T 11640 or GB/T 33145.

8.2.2 The filling and storage of germane shall comply with the provisions of GB/T 14193.1 and TSG

23.Safety management regulations for filling and storage are detailed in the "Hazardous Materials". Regulations on the Safety Management of Chemicals and Regulations on the Safety Supervision of Special Equipment.

8.2.3 The filling factor of germane is

0.05 kg/L.

8.2.4 Gas cylinders with internal surface treatment should be used, and the treated cylinders should comply with the provisions of this document. The connection method of the cylinder valve outlet should preferably be... Use CGADISS632 or CGA350.

8.2.5 Leakage and contamination of the bottle opening should be prevented.

8.2.6 Germanane products should be stored in a cool, dry, and well-ventilated warehouse, away from direct sunlight and heat sources.

8.3 Security Information Safety information for germane can be found in Appendix B.