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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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GB/T 28125.1-2025

Replacing GB/T 28125.1-2011

Gas analysis - Determination of the contents of hazardous materials in air separation process - Part 1: Determination of contents of methane, acetylene, carbon dioxide and hydrocarbons

气体分析 空分工艺中危险物质含量的测定 第1部分：甲烷、乙炔、二氧化碳、总烃含量的测定

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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 28125.GB/T 28125 has the following parts published.

- Determination of Hazardous Substance Content in Gas Analysis and Air Separation Processes - Part 1: Determination of Methane, Acetylene, Carbon Dioxide, and Total Hydrocarbon Content Standard (GB/T 28125.1);

- Determination of hazardous substances in gas analysis air separation process - Part 2: Determination of mineral oil (GB/T 28125.2).

This document replaces GB/T 28125.1-2011 "Determination of Hazardous Substances in Air Separation Processes - Part 1: Determination of Hydrocarbons".

Compared with GB/T 28125.1-2011, the main technical changes in the revised version are as follows, except for structural adjustments and editorial modifications.

- The scope has been changed (see Chapter 1, Chapter 1 of the 2011 edition);

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- Added "Terms and Definitions" (see Chapter 3);

- Added "Experimental Conditions" (see Chapter 5);

- The phrase "quantitative repeatability" has been removed (see Chapter 6 of the 2011 edition);

- Added "Calibration Requirements" and "Metrological Verification or Calibration" (see 7.2, 7.3);

- The sampling requirements have been changed (see Chapter 9, 5.1 of the 2011 edition);

- Added "Precision and Measurement Uncertainty" (see Chapter 12);

- Added "Quality Assurance and Control" (see Chapter 13);

- A carrier gas purification method using flame ionization has been added (see Appendix A);

- Added a typical gas path flow diagram for the determination of C1-C4 hydrocarbon content in oxygen or air using helium ionization gas chromatography.

Typical gas flow diagrams for the determination of total hydrocarbon content in oxygen or air using flame ionization (see Figures B.1 and B.2);

- Added chromatograms for helium ionization chromatography (HICC) to determine oxygen or hydrocarbon content in air, and flame ionization chromatography (FICC) to determine oxygen content.

Chromatograms of total hydrocarbon content in gas or air (see Figures C.1 and C.2).

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 prepared by the Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Gas Standardization (SAC/TC206).

This document was drafted by: Shenzhen Power Supply Bureau Co., Ltd., Beijing Huayu Botai Technology Development Co., Ltd., Gansu Provincial Institute of Metrology, and others.

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The release history of this document and the document it replaces is as follows.

- First published in 2011 as GB/T 28125.1-2011;

- This is the first revision.

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Introduction

Determining the content of hazardous substances in air separation processes is a crucial measure to ensure safe production in gaseous air separation. To better meet the needs of air separation...

The industry's requirements for various hazardous substances necessitate the development of a comprehensive series of analytical method standards.

GB/T 28125, "Determination of Hazardous Substance Content in Gas Analysis and Air Separation Processes," aims to address the issue of determining the content of hazardous substances in air separation processes.

The problem involves determining the content of three categories of substances with different chemical properties. methane, acetylene, carbon dioxide, total hydrocarbons, and mineral oil and nitrogen oxides.

Establish methods to ensure better guidance is provided to users of the documents, especially those responsible for safe production.

GB/T 28125 "Determination of Hazardous Substance Content in Gas Analysis and Air Separation Processes" is intended for trained and experienced professionals.

For professional use. It is proposed to consist of the following three parts.

- Part 1: Determination of methane, acetylene, carbon dioxide, and total hydrocarbon content. The purpose is to provide information on the determination of methane, acetylene, carbon dioxide, and total hydrocarbon content.

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The test procedures, test conditions, reagents and materials, instruments and equipment, sampling, test steps, and test data processing of the content determination method.

Requirements for theoretical accuracy, precision and measurement uncertainty, quality control and assurance, and test reports.

- Part 2: Determination of Mineral Oil Content. The purpose is to provide the test procedures, conditions, and reagents for determining mineral oil content.

Related to materials, instruments and equipment, sampling, test procedures, test data processing, precision and measurement uncertainty, quality control and assurance.

Requirements for test reports.

- Part 3: Determination of Nitrogen Oxide Content. The purpose is to provide the experimental procedures and methods for determining nitrogen oxide content.

Test conditions, reagents and materials, instruments and equipment, sampling, test procedures, test data processing, precision and measurement uncertainty, mass Requirements for control and assurance, and test reports.

Hazards in gas analysis air separation process Determination of substance content Part 1: Methane, Acetylene, Carbon Dioxide, Total Hydrocarbons Determination of content Warning---Personnel using this document should have practical experience working in a formal laboratory. This document does not address all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

This document describes the test procedures for determining the content of methane, acetylene, carbon dioxide, and total hydrocarbons in oxygen and air, and specifies the test conditions and procedures.

Agents and materials, instruments and equipment, sampling, test procedures, test data processing, precision and measurement uncertainty, quality control and assurance, test reports The requirements of the notice.

This document applies to liquid oxygen, liquid air, intake air, and methane, acetylene, and carbon dioxide in air separation processes, as well as in liquid oxygen tanks.

Online and offline monitoring and detection of carbon and total hydrocarbon content. Measurement range. (0.05~500)x10-6 (mole fraction).

2 Normative references

GB/T 4842

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