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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 28727-2025

Replacing GB/T 28727-2012

Gas analysis - Determination of the contents of trace sulfur compounds in gases - Gas chromatography with flame photometric detector

气体分析 气体中微量硫化合物含量的测定 火焰光度气相色谱法

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Table of Contents

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 28727-2012 "Gas Analysis. Determination of Sulfides by Flame Photometric Gas Chromatography".

Compared with GB/T 28727-2012, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- The scope of sulfide content determination and the method for total sulfur content determination have been changed (see Chapter 1, Chapter 1 of the 2012 edition);

- Definitions for five terms-"dry natural gas," "total sulfur," "total organic sulfur," "formal sulfur," and "coke oven gas"-have been removed. A new definition for "total sulfur content" has been added.

The definition of "quantity" (see Chapter 3 of the 2012 edition);

- The relationship between the sulfur compound content and the response value in the principle has been modified (see Chapter 4, Chapter 4 of the 2012 edition);

- Experimental conditions have been added (see Chapter 5);

- The requirements for carrier gas, fuel gas, combustion-supporting gas, and gaseous standard samples have been changed (see Chapter 6, Chapter 5 of the 2012 edition);

- The requirements for flame photometric gas chromatographs and columns have been changed (see Chapter 7, Chapter 6 of the 2012 edition);

- Added requirements for the gas path system (see 7.5);

- The sampling requirements have been changed (see Chapter 8, Chapter 7 in the 2012 edition);

- The experimental procedures have been changed (see Chapter 9, Chapter 8 in the 2012 edition);

- The requirements for processing experimental data have been changed (see Chapter 10, Chapter 9 in the 2012 edition);

- Requirements for precision and measurement uncertainty have been added (see Chapter 11);

- Requirements for quality assurance and control have been added (see Chapter 12);

- The requirements for the content of test reports have been changed (see Chapter 13, Chapter 10 of the 2012 edition).

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 by the China Petroleum and Chemical Industry Federation.

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

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

- First published in 2012 as GB/T 28727-2012;

- This is the first revision.

Gas analysis of trace sulfur compounds in gases Determination of content by flame photometry and gas chromatography 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 specifies the test conditions, reagents and materials, and instruments for determining trace sulfur compounds in gases using flame photometric gas chromatography.

The requirements for equipment, sampling, test data processing, precision and measurement uncertainty, quality assurance and control, and test reports are described, along with the test methods.

The principle and experimental procedures.

This document applies to the determination of various sulfur compounds, including hydrogen sulfide, methanethiol, dimethyl sulfide, and carbon disulfide, and the total sulfur content in gases. Total sulfur The content (calculated as sulfur) is obtained by summing the contents of all sulfur compounds. The determination range for sulfur compound content is (0.02~20)x10-6.

(Mole fraction). For samples outside the measurement range, change the analytical conditions or dilute the sample before measurement.

2 Normative references

GB/T 3634.2

GB/T 4844

GB/T 4946

GB/T 8170

GB/T 8979

GB/T 14850

3 Terms and Definitions

The terms and definitions defined in GB/T 4946, GB/T 14850 and GB/T 43306, as well as the following terms and definitions, apply to this document.

3.1 RS 2O2->SO2 N CO2

The total content of all sulfur compounds in the gas (in terms of sulfur content).

4 Principles

Sulfur compounds generate excited-state S2* in a hydrogen-rich flame, which emits characteristic light in the 350 nm to 450 nm range when it returns to the ground state.

The spectrum shows a maximum peak at 394 nm. The content of sulfur compounds is determined by measuring the intensity of the emitted light using appropriate filters. (Sulfur) The reaction of the compound in a hydrogen-rich flame is as follows. RS 2O2->SO2 N CO2