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

**中华人民共和国国家标准**

**GB/T 11060.10-2014**

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**Natural gas—Determination of sulfur  
compounds—Part 10: Determination of sulfur  
compounds using gas chromatography method**

**天然气 含硫化合物的测定**

**第 10 部分：用气相色谱法测定硫化合物**

(ISO 19739: 2004, Natural gas-determination of sulfur compounds using gas  
chromatography, MOD)

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## Foreword

GB/T 11060 *Natural gas—Determination of sulfur compound* divided into 12 parts:

- Part 1: Part 1: Determination of hydrogen sulfide content by iodometric titration method;
- Part 2: Determination of hydrogen sulfide content by methylene blue method;
- Part 3: Determination of hydrogen sulfide content by lead acetate reaction rate dual photo path method;
- Part 4: Determination of total sulfur content by oxidative microcoulometry method;
- Part 5: Determination of total sulfur content by hydrogenolysis and rateometric colorimetry method;
- Part 6: Determination of hydrogen sulfide, mercaptan sulfur and carbonyl sulfide sulfur by potentiometry;
- Part 7: Determination of total sulfur content by Lingener combustion method;
- Part 8: Determination of total sulfur content by Ultraviolet fluorescence method;
- Part 9: Determination of mercaptan sulfur content by iodometric titration method;
- Part 10: Determination of sulfur compounds using gas chromatography method;
- Part 11: Determination of hydrogen sulfide content by length-of-stain detector tubes method;
- Part 12: Determination of hydrogen sulfide content by laser absorption spectroscopy.

This part is part 10 of GB/T 11060.

This part is drafted according to the rules specified in GB/T 1.1-2009

This part is compiled by referencing ISO 19739:2004 *Natural Gas - Determination of Sulfur Compounds Using Gas Chromatography*.

Compared with ISO 19739:2004, this part shows the following discrepancies:

- Modify “scope”; the original scope of standard is expanded as “this standard is applicable to the determination of hydrogen sulfide, carbonyl sulfide, C1~C2 mercaptan, sulfide and THT”
- Modify the reference conditions of gas measurement; replace “101.325 kPa and 293.15 K” in Chinese standard with “101.325 kPa and 288.15 K” in ISO 19739:2004.

This standard also shows the following editions:

- Modify the name of standard; change the original name of “Natural Gas - Determination of Sulfur Compounds Using Gas Chromatography” to “Natural Gas - Determination of Sulfur Compounds - Part 10: Determination of Sulfur Compounds Using Gas Chromatography Method”
- In “normative references”, Chinese standards replace the relevant international standards
- Modify the editorial errors in Appendix H. The positions of Figure H.1 and H.2 in original standard are changed.

This part is under jurisdiction of the National Technical Committee on Natural Gas of Standardization Administration of China (SAC/TC 244).

Drafting units of this part: Natural Gas Research Institute of PETROCHINA Southwest Oil & Gasfield Company, Daqing Petrochemical Engineering Co., Ltd., Langfang Research Institute of Petroleum Exploration & Development, and PETROCHINA Pipeline R&D Center

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# Natural gas—Determination of sulfur compounds—Part 10: Determination of sulfur compounds using gas chromatography method

## 1 Scope

This part of GB/T 11060 specifies the determination of hydrogen sulfide, carbonyl sulfide, C1 to C4 thiols, sulfides and tetrahydrothiophene (THT) using gas chromatography (GC).

This part is applicable to determination of hydrogen sulfide, carbonyl sulfide, C1 to C4 thiols, sulfides and tetrahydrothiophene (THT), determination range: 0.1 mg/m<sup>3</sup> to 600 mg/m<sup>3</sup>.

NOTE: Depending on the method chosen from those given in the annexes, the application ranges for the determination of sulfur compounds can vary, but whichever of the methods is used, the requirements of this International Standard apply.

## 2 Normative references

The articles contained in the following documents have become this document when they are quoted herein. For the dated documents so quoted, all the modifications (including all corrections) or revisions made thereafter shall be applicable to this document.

GB/T 5275.10 Gas analysis—Preparation of calibration gas mixtures using dynamic volumetric methods—Part 10: Permeation method (GB/T 5275.10-2009, ISO 6145-10:2002, IDT)

GB/T 6379.2-2004 Accuracy (trueness and precision) of measurement methods and results--Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method (ISO 5725-2:1994, IDT)

GB/T 10628 Gas analysis - Comparison methods for determining and checking the composition of calibration gas mixtures (GB/T 10628-2008, IDT ISO 6143:2001)

GB/T 13609 Natural gas sampling guidelines

HG/T 2975 Gas analysis-Calibration gas mixtures-Certificate of mixture preparation (HG 2975-1989, idt ISO 6141-1979)

### **3 Terms and definitions**

For the purpose of this document, the following terms and definitions shall apply.

#### **3.1**

##### **alkane thiol alkyl mercaptan**

organic sulfur compound with the general formula R-SH (where R is the alkyl group), either naturally present or added as an odorant to natural gas

[GB/T 20604-2006, definition 2.5.3.3.1]

EXAMPLE Methanethiol (MeSH), ethanethiol (EtSH), 2-methylpropane-2-thiol (tert-butylmercaptan TBM).

#### **3.2**

##### **alkyl disulfide**

organic sulfur compound with the general formula R-S-S-R (where R and R are alkyl groups)

[GB/T 20604-2006, definition 3.5.3.3.3]

#### **3.3**

##### **alkyl sulfide thioether**

organic sulfur compound with the general formula R-S-R (where R and R are alkyl groups), either naturally present or added as an odorant to natural gas

[GB/T 20604-2006, definition 3.5.3.3.2]

EXAMPLE Dimethyl sulfide (DMS), diethyl sulfide (DES).

#### **3.4**

##### **carbonyl sulfide COS**

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