

ICS 75.060  
CCS E24



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

**GB/T 11060.1-2023**

Replacing GB/T 11060.1-2010

---

**Natural gas - Determination of sulfur compound - Part 1:  
Determination of hydrogen sulfide content by iodometric  
titration method**

天然气 含硫化合物的测定 第1部分：用碘量法测定硫化氢含量

**Issued on: May 23, 2023**

**Implemented on: September 1, 2023**

---

**Issued by: State Administration for Market Regulation;  
Standardization Administration of China**

## Table of Contents

|                                                 |    |
|-------------------------------------------------|----|
| 1 Scope .....                                   | 1  |
| 2 Normative references .....                    | 1  |
| 3 Terms and Definitions .....                   | 1  |
| 4 Principle .....                               | 1  |
| 5 Reagents and materials .....                  | 1  |
| 6 Instrument .....                              | 3  |
| 3 Titration .....                               | 8  |
| 2 Calculation of hydrogen sulfide content ..... | 9  |
| 1 Sample dosage selection Table .....           | 12 |

## Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document is part 1 of GB/T 11060 "Determination of Sulfur Compounds in Natural Gas": GB/T 11060 has issued the following part:

- Part 1: Determination of hydrogen sulfide content by iodometric method;
- Part 2: Determination of hydrogen sulfide content by the methylene blue method;
- Part 3: Determination of hydrogen sulfide content by double-light path detection method of lead acetate reaction rate;
- Part 4: Determination of total sulfur content by oxidative microcoulometry;
- Part 5: Determination of total sulfur content by hydrogenolysis-rate meter colorimetric method;
- Part 6: Measuring the content of hydrogen sulfide, mercaptan sulfur and sulfur oxide carbon by potentiometric method;
- Part 8: Determination of total sulfur content by ultraviolet fluorescence photometry;
- Part 9: Determination of mercaptan sulfur content by iodometric method;
- Part 10: Determination of sulfur compounds by gas chromatography;
- Part 11: Determination of hydrogen sulfide content by coloring length detection tube method;

--- Part 12: Determination of hydrogen sulfide content by laser absorption spectroscopy;

--- Part 13: Determination of hydrogen sulfide content by ultraviolet absorption method: This document replaces GB/T 11060:1-2010 "Determination of sulfur compounds in natural gas

- Part 1: Determination of hydrogen sulfide by iodometric method Content", compared with GB/T 11060:1-2010, except for structural adjustment and editorial changes, the main technical changes are as follows:

a) The requirements for potassium dichromate have been changed (see 5:2, 4:2 of the:2010 edition);

## 1 Scope

GB/T 11060.1-2023 is the Chinese national standard on natural gas - determination of sulfur compound - part 1: determination of hydrogen sulfide content by iodometric titration method, in the field of petroleum and related technologies. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 September 2023. Classification: ICS 75.060, CCS E24. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the principle, reagents and materials, instruments, test procedures, and test data processing for the determination of hydrogen sulfide content in natural gas by iodometric method: rationale and precision: This document applies to the determination of hydrogen sulfide content in natural gas, measurement range: 0% ~ 100%:

## 2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document: Preparation of

GB/T 601 Chemical Reagent Standard Titration Solution

GB/T 6682 Analytical laboratory water specifications and test methods

GB/T 13609 Natural Gas Sampling Guidelines

GB/T 20604 Natural Gas Vocabulary SY/T 6277 Specifications for Personal Protection in

## Hydrogen Sulfide Environment

### 3 Terms and Definitions

The terms and definitions defined in GB/T 20604 apply to this document:

### 4 Principles

Absorb the hydrogen sulfide in the gas sample with excess zinc acetate solution to generate zinc sulfide precipitate: Add excess iodine solution to oxidize the sulfur formed Zinc chloride, and the remaining iodine was titrated with sodium thiosulfate standard solution: Calculate the hydrogen sulfide content according to the consumption of sodium thiosulfate standard solution:  $\text{H}_2\text{S} + \text{Zn}(\text{Ac})_2 \rightarrow \text{ZnS} + 2\text{HAc}$   $\text{ZnS}(\text{solid}) \rightarrow \text{Zn}^{2+} + \text{S}^{2-}$   $\text{S}^{2-} + \text{I}_2 \rightarrow \text{S} + 2\text{I}^-$   $2\text{S} + \text{O}_2 \rightarrow 2\text{S} + \text{O}_2$

### 5 Reagents and materials

Unless otherwise specified, use only analytical grade reagents: 5:

1 Water: Class III in GB/T 6682: