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Natural gas — Determination of sulfur compounds using gas chromatography

Gaz naturel — Détermination des composés soufrés par chromatographie en phase gazeuse

Reference number
ISO 19739:2004(E)

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 19739 was prepared by Technical Committee ISO/TC 193, *Natural gas*, Subcommittee SC 1, *Analysis of natural gas*.

This first edition of ISO 19739 cancels and replaces ISO 6326-2:1981 and ISO 6326-4:1994, of which it constitutes a technical revision.

This corrected version of ISO 19739:2004 incorporates the following corrections:

- page 2, 3.2: a prime has been added to the second R in the formula and the description in parenthesis;
- page 2, 3.3: a prime has been added to the second R in the formula and the description in parenthesis;
- page 7, 9 b): the name of the molecule has been corrected to 2-methylpropane-2-thiol;
- pages 20, 31, 43 and 44: the footnotes have been corrected to read "...this International Standard...";
- page 22, D.3.4.2: the temperature has been changed to 293 K;
- page 43: the name of the molecule has been corrected to 2-methylpropane-2-thiol;
- other minor editorial rectifications.

Introduction

Sulfur compounds may occur naturally in natural gas and remain as traces after treatment, or they may have been injected deliberately to allow subsequent olfactory detection for safety reasons.

The standardization of several methods for the determination of sulfur compounds in natural gas is necessary in view of the diversity of these compounds (hydrogen sulfide, carbonyl sulfide, tetrahydrothiophene, etc.) and the requirements of the determinations (e.g. required uncertainty, measurement at the drilling head, clean-up plant or in transmission pipes).

In order to enable its user to choose the most appropriate method for his/her particular needs and perform the measurements under the best conditions, this International Standard gives the requirements needed to perform a sulfur analysis.

Natural gas — Determination of sulfur compounds using gas chromatography

WARNING — Some sulfur compounds can constitute a serious health hazard.

1 Scope

This International Standard specifies the determination of hydrogen sulfide, carbonyl sulfide, C_1 to C_4 thiols, sulfides and tetrahydrothiophene (THT) using gas chromatography (GC). 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 following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5725-2:1994, *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 6141, *Gas analysis — Requirements for certificates for calibration gases and gas mixtures*

ISO 6143, *Gas analysis — Comparison methods for determining and checking the composition of calibration gas mixtures*

ISO 6145-10, *Gas analysis — Preparation of calibration gas mixtures using dynamic volumetric methods — Part 10: Permeation method*

ISO 10715:1997, *Natural gas — Sampling guidelines*

ISO 14532:2001, *Natural gas — Vocabulary*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

[ISO 14532:2001, definition 2.5.3.3.1]

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