Natural gas - Determination of sulfur compounds - Determination of total sulfur by oxidative microcoulometry method (ISO 16960:2014)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16960

October 2014

ICS 75.060

English Version

Natural gas - Determination of sulfur compounds - Determination of total sulfur by oxidative microcoulometry method (ISO 16960:2014)

Gaz naturel - Détermination des composés soufrés - Détermination de la teneur totale en soufre par microcoulométrie oxydante (ISO 16960:2014)

Erdgas - Bestimmung von Schwefelverbindungen - Bestimmung des Schwefelgehalts mittels oxidativem mikrocoulometrischen Verfahren (ISO 16960:2014)

This European Standard was approved by CEN on 24 August 2014.

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Ref. No. EN ISO 16960:2014 E

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Foreword

This document (EN ISO 16960:2014) has been prepared by Technical Committee ISO/TC 193 "Natural gas".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2015, and conflicting national standards shall be withdrawn at the latest by April 2015.

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Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Test principle **1**
4 Reagents **1**
5 Apparatus **2**
5.1 Converter 2
5.2 Titration cell 2
5.3 Microcoulometer 2
5.4 Flow controller 2
5.5 Electromagnetic agitator 2
5.6 Medical syringe 2
5.7 Volumetric flask 2
6 Test preparation **2**
6.1 Preparation of electrolyte 2
6.2 Reference sample 2
6.3 Apparatus installation 3
6.4 Preparation of instrument 3
6.5 Check and adjustment of the instrument 3
6.6 Determination of recovery factor of sulfur 3
7 Test procedure **4**
7.1 Sampling 4
7.2 Sample injection and measurement 4
8 Calculation **4**
8.1 Volume conversion 4
8.2 Calculation of total sulfur mass concentration in the gas sample 5
9 Precision **6**
9.1 General 6
9.2 Repeatability 6
Bibliography **7**

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Introduction

Three methods for determination of sulfur compounds in natural gas already exist as International Standards:

— ISO 6326-3, Natural gas — Determination of sulfur compounds — Part 3: Determination of hydrogen sulfide, mercaptan sulfur and carbonyl sulfide sulfur by potentiometry;

— ISO 6326-5, Natural gas — Determination of sulfur compounds — Part 5: Lingener combustion method;

— ISO 19739, Natural gas — Determination of sulfur compounds using gas chromatography.

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Natural gas — Determination of sulfur compounds — Determination of total sulfur by oxidative microcoulometry method

WARNING — The use of this International Standard can involve hazardous material, operations, and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a method for the determination of total sulfur in the range from 1 mg/m^3 to 200 mg/m^3 in pipeline natural gas by oxidative microcoulometry. Natural gas with sulfur contents above 200 mg/m^3 can be analysed after dilution with a suitable sulfur-free solvent.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 6142, *Gas analysis — Preparation of calibration gas mixtures — Gravimetric method*

ISO 6144, *Gas analysis — Preparation of calibration gas mixtures — Static volumetric method*

ISO 6146, *Gas analysis — Preparation of calibration gas mixtures — Manometric method*

ISO 10715, *Natural gas — Sampling guidelines*

3 Test principle

A gas sample containing sulfur is mixed with oxygen in a quartz furnace tube in order to convert the sulfur compounds to sulfur dioxide by oxidative pyrolysis. The obtained sulfur dioxide enters the titration cell along with carrier gas and reacts with iodine contained therein. The consumed iodine is complemented by the electrolysis of potassium iodide. In accordance with Faraday's law of electrolysis, the sulfur concentration in the gas sample can be calculated from the consumed electric quantity by electrolysis and corrected by comparison to a reference standard sample.

4 Reagents

4.1 Test water, conforming to the requirements of Grade 3 of ISO 3696,

4.2 Glacial acetic acid, analytical purity.

4.3 Potassium iodide, analytical purity.

4.4 Oxygen, minimum purity 99,99 % (by volume fraction), maximum volume fraction of sulfur containing gases 0,01 % (by volume fraction).

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