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Analysis of natural gas — Biomethane — Determination of halogenated compounds — —

Part 1: HCl and HF content by ion chromatography

Analyse du gaz naturel — Biométhane — Détermination des composés halogénés —

Partie 1: Détermination de la teneur en HCl et HF par chromatographie ionique

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This document was prepared by Technical Committee ISO/TC 193, *Natural gas*, Subcommittee SC 1, *Analysis of natural gas*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 408, *Biomethane for use in transport and injection in natural gas pipelines*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 2611 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

~~For a method for~~ measuring hydrogen chloride (HCl) and hydrogen fluoride (HF) in biomethane, ~~the~~ ~~method~~ is described based on the absorption of these components on an alkali-impregnated quartz fibre filtre. The anions chloride and fluoride are then analysed by ion chromatography with conductimetric detection. The concentrations are expressed in equivalent hydrochloric acid and hydrofluoric acid at appropriate reference conditions.

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Analysis of natural gas — Biomethane — Determination of halogenated compounds — ~~Part 1: HCl and HF content by ion chromatography~~

Part 1: HCl and HF content by ion chromatography

1 Scope

This document specifies a method for the determination of the concentration hydrochloric acid (HCl) and hydrofluoric acid (HF) in biomethane, after absorption on an alkali-impregnated quartz fibre filtre or in a sorbent trap, by ion chromatography (IC) with conductimetric detection.

The method is applicable to biomethane for concentration levels for HCl from 0,07 mg/m³ to 35 mg/m³ and for HF from 0,07 mg/m³ to 20 mg/m³.

Unless stated otherwise, all concentrations in this ~~standard document~~ are given under standard reference conditions (see ISO 13443~~###~~). Other conditions can be applied.

This method is also applicable to biogas. This method is intended to support conformity assessment of biomethane and biogas according to specifications, such as ~~the EN 16723### series~~.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 6974-1, *Natural gas — Determination of composition and associated uncertainty by gas chromatography — Part 1: General guidelines and calculation of composition*

ISO 6974-2, *Natural gas — Determination of composition and associated uncertainty by gas chromatography — Part 2: Uncertainty calculations*

ISO 6974-3, *Natural gas — Determination of composition and associated uncertainty by gas chromatography — Part 3: Precision and bias*

ISO 6976, *Natural gas — Calculation of calorific values, density, relative density and Wobbe indices from composition*

ISO 10304-1, *Water quality — Determination of dissolved anions by liquid chromatography of ions — Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate*

ISO 14532, *Natural gas — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14532 and the following apply.

ISO and IEC maintain ~~terminological terminology~~ databases for use in standardization at the following addresses:

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— ~~ISO Online browsing platform: available at <https://www.iso.org/obp>~~

— ~~IEC Electropedia: available at <https://www.electropedia.org/>~~

3.1

analyte

element, ion or substance to be determined by an analytical method

[SOURCE: EN 16687:2015, 4.1.11]

4 Symbols and ~~abbreviations~~abbreviated terms

4.1 Symbols

Symbol	Description	Unit
$\rho_{(x)}$	Concentration of gaseous hydrogen chloride or hydrogen fluoride in biomethane	$\mu\text{g}/\text{m}^3$
$\rho_{(x-)}$	Concentration of ions chlorides or fluorides	$\mu\text{g}/\text{l}$
$M_{(x-)}$	Molar mass of ions chlorides or fluorides	g/mol
$M_{(x)}$	Molar mass of hydrogen chloride or hydrogen fluoride	g/mol
$m_{(x)}$	Mass of gaseous chlorides or fluorides collected	μg
V_S	Volume of extract solution	l
V_{gas}	Volume of the gas sampled	m^3
q_V	Volume flow rate of the gas during sampling	ml/min
p_0	Pressure at reference conditions	kPa
p_{gas}	Pressure at sampling conditions	kPa
t	Sampling time	min
T_0	Temperature at reference conditions	K
T_{gas}	Temperature at sampling conditions	K
Z	Compressibility factor	1

4.2 Abbreviations

4.2 Abbreviated terms

CD	Coulometric <u>conductimetric</u> detector
HCl	<u>Hydrochloric acid</u>
HF	<u>hydrofluoric acid</u>
HPLC	<u>high-performance liquid chromatography</u>
IC	<u>ion chromatography</u>
SI	International System <u>international system</u> of Units <u>units</u>