BS ISO 17198:2014

BSI Standards Publication

Dimethyl ether (DME) for fuels — Determination of total sulfur, ultraviolet fluorescence method

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National foreword

This British Standard is the UK implementation of ISO 17198:2014.

The UK participation in its preparation was entrusted to Technical Committee PTI/13, Petroleum Testing and Terminology.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Dimethyl ether (DME) for fuels — Determination of total sulfur, ultraviolet fluorescence method

DME comme carburant ou combustible — Détermination de la teneur en soufre total — Méthode par Fluorescence Ultraviolet

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 28, *Petroleum products and lubricants*, Subcommittee SC 4, *Classifications and specifications*.

Introduction

In general, large amounts of DME in the international trade and domestic transportation can be executed using sea and/or various land transportations. From the feed stock of synthesis gas for DME production, and throughout the loading and transportation, there is a risk of increasing sulfur contents.

Any sulfur compounds in DME contributes to SO_x emissions. It can also cause corrosion in equipment. Therefore, sulfur content is tested accurately in process feeds, in finished products, as well as for compliance determinations required by regulatory authorities. It is common practice to analyse the sulfur, either by ultraviolet fluorescence or by oxidative microcoulometry.

This International Standard specifies the procedure of test by ultraviolet fluorescence method.

INTERNATIONAL STANDARD ISO 17198:2014(E)

Dimethyl ether (DME) for fuels — Determination of total sulfur, ultraviolet fluorescence method

WARNING — The use of this International Standard can involve hazardous materials, 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 determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a procedure of test for the sulfur content in dimethyl ether (DME) used as fuel by the ultraviolet (UV) fluorescence method. This procedure is applicable to determine the amount of total sulfur up to the value specified in ISO 16861.

This test method will not measure sulfur that is not volatile under the practical conditions of the test, namely room temperature and atmospheric pressure.

NOTE The precision of this method has been studied for a limited set of samples and content levels by a limited amount of labs. It allows establishment of a quality specification of DME but cannot be considered as a full precision determination in line with the usual statistical methodology as in ISO 4259.

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 16861, *Petroleum products — Fuels (class F) — Specifications of dimethyl ether (DME)*

ISO 29945, *Refrigerated non-petroleum-based liquefied gaseous fuels — Dimethylether (DME) — Method of manual sampling onshore terminals*

3 Principle

A DME sample is directly injected into a UV fluorescence detector. The sample enters into a high-temperature combustion tube (1 000°C to 1 100°C), where the sulfur is oxidized to sulfur dioxide (SO_2) in an oxygen-rich atmosphere. Water produced during the sample combustion is removed and the sample combustion gases are exposed to ultraviolet (UV) light. The SO_2 absorbs the energy from the UV light and is converted to excited SO_2. The fluorescence emitted from the excited SO_2 as it returns to a stable state SO_2 is detected by a photomultiplier tube and the resulting signal is a measure of the sulfur contained in the sample.

4 Reagents and materials

4.1 Inert gas, argon or helium, of high purity grade with a minimum purity of 99,998 volume %.

4.2 Oxygen, of high purity grade with a minimum purity of 99,75 volume %.