NSAI Standards

Irish Standard
I.S. EN 17178:2019

Liquid petroleum products - Determination of the total volatile sulfur content in liquefied petroleum gases by ultraviolet fluorescence spectroscopy

I.S. EN 17178:2019

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 17178:2019 is the adopted Irish version of the European Document EN 17178:2019, Liquid petroleum products - Determination of the total volatile sulfur content in liquefied petroleum gases by ultraviolet fluorescence spectroscopy

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17178

September 2019

ICS 75.160.20

English Version

Liquid petroleum products - Determination of the total volatile sulfur content in liquefied petroleum gases by ultraviolet fluorescence spectroscopy

Produits pétroliers liquides - Détermination de la teneur en soufre volatil dans les gaz de pétrole liquéfiés par spectroscopie de fluorescence ultra-violette

Flüssige Mineralölerzeugnisse - Bestimmung des Gesamtgehaltes an flüchtigem Schwefel in Flüssiggas (LPG) durch Ultraviolettfluoreszenz-Spektroskopie

This European Standard was approved by CEN on 20 June 2019.

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Contents

Page

European foreword

This document (EN 17178:2019) has been prepared by Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by March 2020 and conflicting national standards shall be withdrawn at the latest by March 2020.

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

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Introduction

The sulfur content of LPG used for fuel purposes contributes to SO_x emissions and can lead to corrosion in engine and exhaust systems. Sulfur also acts as catalyst poison, blocking and damaging catalysts like catalytic converters in cars and process catalysts in the chemical industry where LPG is used as feedstock.

Due to the need for lower sulfur limits, this document was developed in order to solve precision issues with existing test methods [3, 4].

1 Scope

This document specifies an ultraviolet (UV) fluorescence test method for the determination of the sulfur content of liquefied petroleum gases (LPG) containing up to 0,35 % (m/m) halogens, and having sulfur contents in the range of 2 mg/kg to 50 mg/kg.

This test method does not detect sulfur compounds that do not vaporize under the conditions of the test.

NOTE 1 LPG is defined as low pressure liquefied gas composed of one or more light hydrocarbons which are assigned to UN 1011, 1075, 1965, 1969 or 1978 only and which consists mainly of propane, propene, butane, butane isomers, butenes with traces of other hydrocarbon gases.

NOTE 2 For the purposes of this document, the terms "% (m/m)" and "% (V/V)" are used to represent respectively the mass fraction, μ, and the volume fraction, φ.

WARNING — The use of this standard can involve hazardous materials, operations and equipment. This standard does not purport to address all the safety problems associated with its use. It is the responsibility of users of this standard to take appropriate measures to ensure the safety and health of personnel prior to the application of the standard, and fulfil statutory and regulatory requirements for this purpose.

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.

EN ISO 4257, *Liquefied petroleum gases — Method of sampling (ISO 4257)*

3 Terms and definitions

No terms and definitions are listed in this document.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Principle

This test method is used to determine sulfur in process feeds and in finished products and can also be used for compliance determinations when acceptable to a regulatory authority.

An appropriate sample is taken from the sample container and introduced into the analyser. The gaseous sample then enters a high temperature (900 °C – 1 100 °C) combustion tube where sulfur is oxidized to sulfur dioxide (SO_2) in an oxygen rich atmosphere.

Water produced during the sample combustion is removed and the remaining sample combustion gases are exposed to UV light. The SO_2 absorbs the energy from the UV light and is converted to excited sulfur dioxide (SO_2*). The fluorescence emitted from the excited SO_2* molecules as they return 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.