International Standard

ISO 13032

Petroleum and related products — Determination of low concentration of sulfur in automotive fuels — Energy-dispersive X-ray fluorescence spectrometric method

Produits pétroliers et connexes — Détermination de la teneur en soufre en faible concentration dans les carburants pour automobiles — Méthode spectrométrique de fluorescence de rayons X dispersive en énergie

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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.

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 document 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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This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 19, *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 13032:2012), which has been technically revised.

The main changes are as follows:

— extension of the Scope to include paraffinic diesel fuel and neat fatty acid methyl ester (FAME);

— update of precision statements as well as the concentration range which are based on results of a new interlaboratory study, for gasoline and diesel type fuels, and FAME type samples.

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.

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Introduction

This document is directed specifically at the lower end of the concentration range covered in ISO 20847. By selecting the instrument type, a better signal-to-background ratio for sulfur K-$L_{2,3}$ emission is ensured. A knowledge of the general composition of the sample for analysis is advantageous in obtaining the best test result.

NOTE IUPAC X-ray line notation (S K-$L_{2,3}$) is used in this document; the corresponding Siegbahn X-ray line notation (S Kα or S $K\alpha_{1,2}$) is being phased out.

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Petroleum and related products — Determination of low concentration of sulfur in automotive fuels — Energy-dispersive X-ray fluorescence spectrometric method

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

1 Scope

This document specifies an energy dispersive X-ray fluorescence (EDXRF) test method for the determination of sulfur content in automotive fuels. This document is applicable to:

— gasoline containing up to 3,7 % oxygen by mass (including those blended with ethanol up to 10 % by volume) having sulfur contents in the range of 6,9 mg/kg to 56,7 mg/kg,

— diesel fuels including those containing up to about 30 % fatty acid methyl ester (FAME) by volume, paraffinic diesel fuel, and neat FAME, having sulfur contents in the range of 5,0 mg/kg to 60,2 mg/kg.

The sulfur content in other products can be determined according to the test method specified in this document; however, no precision data for products other than automotive fuels and for results outside the specified range have been established for this document.

For reasons of spectral overlap, this document is not applicable to leaded automotive gasoline, gasoline having a content of greater than 8 mg/kg lead or to product and feedstock containing lead, silicon, phosphorus, calcium, potassium or halides at concentrations greater than one tenth of the concentration of sulfur measured, or more than 10 mg/kg, whichever is the greater.

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 3170, *Petroleum liquids — Manual sampling*

ISO 3171, *Petroleum liquids — Automatic pipeline sampling*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

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