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**Committee D02 on Petroleum Products, Liquid Fuels, and
Lubricants
Subcommittee D02.040L on Gas Chromatography Methods**

Research Report: D02-2018

**Interlaboratory Study to (Re)establish Precision Statements for
ASTM D6839, Standard Test Method for Hydrocarbon Types,
Oxygenated Compounds, and Benzene and Toluene in Spark
Ignition Engine Fuels by Multidimensional Gas Chromatography¹**

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1. Introduction

Standard Test Method D6839¹ covers the quantitative determination of saturates, olefins, aromatics, and oxygenates in spark-ignition engine fuels by multidimensional gas chromatography. This test method is specifically developed for the analysis of automotive motor gasoline that contains oxygenates.

Part A of Test Method D6839 is applicable to automotive motor gasoline for which precision has been obtained for total volume oxygenates from 0.8% up to 15%, volume aromatics up to 50% and total mass fraction of oxygen from about 1.5% to about 3.7%.

Part B of Test Method D6839 describes the procedure for the analysis of oxygenated groups (ethanol, methanol, ethers, C3 to C5 alcohols) in ethanol fuels containing an ethanol volume fraction between 50 % and 85 % (17 % to 29 % oxygen).

The Inter Laboratory Study documented in this Research Report is only applicable to Part A of Test Method D6839 and explicitly not part B of this Test Method.

Calculations of precisions are carried out in accordance with ISO4259-1² and ASTM D6300³ based on an inter laboratory study (ILS) and 3 different sets of samples.

2. Test Method:

The Test Method used for this ILS is ASTM D6839, Standard Test method for Hydrocarbon Types, Oxygenated Compounds, and Benzene in Spark Ignition Engine Fuels by Gas Chromatography. To obtain a copy of D6839, go to ASTM's website, www.astm.org, or contact ASTM Customer Service by phone at 610-832-9585 (8:30 a.m. - 4:30 p.m. Eastern U.S. Standard Time, Monday through Friday) or by email at service@astm.org.

3. Participating Laboratories:

The laboratories participated in this interlaboratory study are presented in Annex A-0:

¹ ASTM 6839 Standard Test Method for Hydrocarbon Types, Oxygenated Compounds, and Benzene in Spark Ignition Engine Fuels by Gas Chromatography

² ISO 4259-1 Petroleum and related products — Precision of measurement methods and results — Part 1: Determination of precision data in relation to methods of test

³ ASTM D6300 Standard Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants

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4. Description of Samples:

For this ILS study 3 sets of 10 samples in duplicate, each of varying targeted results are prepared and distributed by PAC Rotterdam. The samples were double blind coded and divided into batches. Below is a list of the sample sets:

Sample set 1

10 gasolines with a total volume fraction of methanol from about 1 up to 16 vol%, a total volume fraction of ethanol of about 3 up to 18 vol% and a total volume fraction of benzene from about 0.4 up to 2vol%.

One sample also contained MTBE and ETBE.

Sample set 2

10 gasolines with a total volume fraction of MTBE from about 1 up to 16 vol%, a total volume fraction of ETBE of about 1 up to 16 vol% and a total volume fraction of toluene from about 0.5 up to 30 vol%.

One sample contained also ethanol.

Sample set 3

10 gasolines with a total volume fraction of TAME from about 1 up to 16 vol%, a total volume fraction of TAEE of about 1 up to 16 vol% and a total volume fraction of toluene from about 0.5 up to 30 vol%.

Two samples also contained MTBE and ETBE and ethanol.