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**Committee D16 on Aromatic Hydrocarbons and Related Chemicals  
Subcommittee D16.04 on Instrumental Analysis**

**Research Report D16-1038**

**Interlaboratory Study to Establish Precision Statements for ASTM  
D4735-09, Determination of Trace Thiophene in Refined Benzene by  
Gas Chromatography**

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**1. Introduction:**

Interlaboratory Study 227 was conducted to establish a precision statement for D4735, Determination of Trace Thiophene in Refined Benzene by Gas Chromatography.

**2. Test Method:**

The Test Method used for this ILS is D4735-09. To obtain a copy of D4735, go to ASTM's website, [www.astm.org](http://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](mailto:service@astm.org).

**3. Participating Laboratories:**

The following laboratories participated in this interlaboratory study

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**4. Description of Samples:**

There were 6 samples of varying targeted results used for this study. Each sample was supplied, prepared and distributed by Jeffrey Werner of DCG Partnership. Below is a list of the samples with the corresponding supplier:

1. Sample with a concentration of a blank
2. Sample with a concentration of 0.6 mg thiophene/kg benzene (mg/kg)
3. Sample with a concentration of 0.8 mg/kg
4. Sample with a concentration of 2.2 mg/kg
5. Sample with a concentration of 1.85 mg/kg
6. Sample with a concentration of 1.2 mg/kg

**5. Interlaboratory Study Instructions**

Laboratory participants were emailed the test program instructions. For a copy of the instructions, please see Annex A.

**6. Description of Equipment/Apparatus<sup>1</sup>:**

For information on the equipment/apparatus used by each laboratory, please see Annex B.

**7. Data Report Forms:**

Each laboratory was provided with a data report form for the collection of data. A copy of the data is provided in Annex C.

Each participating laboratory answered a group of questions about their analyses. A copy of those questions and answers is provided in Annex D.

Please note: The laboratories have been randomly coded and cannot be identified herein.

**8. Statistical Data Summary:**

A summary of the statistics calculated from the data returned by the participating laboratories is provided in Annex E.

**9. Precision and Bias Statement:**

9.1 The precision of this test method is based on an interlaboratory study of ASTM D4735-02, Standard Test Method for Determination of Trace Thiophene in Refined Benzene by Gas Chromatography, conducted in 2008. Six laboratories participated in the PFPD study, while just a single lab participated in the FPD portion of the study. The laboratories reported triplicate test results for benzene samples spiked with five concentrations of thiophene plus one benzene blank.

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<sup>1</sup> The equipment listed was used to develop a precision statement for D4735-09. This listing is not an endorsement or certification by ASTM International.  
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