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**8 July 1994**

**Committee D02 on Petroleum Products and Lubricants  
Subcommittee D02.D0 on Hydrocarbons for Chemical and Special Uses**

**Research Report D02-1328**

**Interlaboratory Study to Establish Precision Statements for ASTM  
D5501, Test for Determination of Ethanol Content of Denatured Fuel  
Ethanol by Gas Chromatography**

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RESEARCH REPORT: D.02: \_\_\_\_\_

Interlaboratory Cooperative Study for Proposed Test Method for  
Determination of Oxygenates in Gasoline by Gas Chromatography and Oxygen  
Selective Flame Ionization Detection

Introduction

Ethers, alcohols, and other oxygenates may be added to gasoline to increase octane number and reduce emissions. The type and concentration of various oxygenates are specified and regulated to ensure acceptable commercial gasoline quality. Drivability, vapor pressure, phase separation, exhaust and evaporative emissions are some of the concerns associated with oxygenated fuels. A test method based on oxygen-selective flame ionization detection has been developed to address levels and types of oxygenates to be mandated in gasolines. The method was developed through the efforts of the members of a Study Group under Section L of ASTM Committee D.02, Subcommittee 04. The first meeting of this GC Oxygenates Study Group to develop this method was on June 18, 1990 in San Francisco. A copy of the method (Draft #7, 6/93) as used in the cooperative study is included here as Appendix I. Six sets of data were received. All data returned were statistically evaluated in this study.

List of Participating Laboratories

Appendix II lists the Cooperators in the Fall, 1992 interlaboratory method test program.

List of Round Robin Samples

Appendix III lists the types of samples and their sources used in the test program.

Cooperative Test Program Instructions

Copies of the interlaboratory test program cover letter, report forms, and other correspondence forms are in Appendix IV.

Cooperator Test Result Reports

The Original data reports submitted by each cooperator are given in Appendix V. A compilation of the duplicate results from each lab for each sample is given as Appendix V-Summary.

Statistical Evaluation of the Data

Appendix VI gives the statistical evaluation of the interlaboratory test data, as provided by D. Porter, a statistician of Amoco Corporation. The precision data provided in the method is also given. The statistical evaluation was performed using the ASTM E691 precision analysis. Bias was not determined due to the lack of standard reference materials.

Ruggedness Test

A synopsis of a minirobustness test conducted prior to the full round robin study is given in Appendix VII.

Status Summary

The method will be balloted in the Subcommittee 4 Fall 1993 ballot.

Reported by: Cherlyn Bradley  
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