Acurex Environmental Final Report FR-96-114

EVALUATION OF FUEL-CYCLE EMISSIONS ON A REACTIVITY BASIS

Volume 2 — Appendices

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Prepared For

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ACKNOWLEDGEMENTS

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APPENDIX A

GASOLINE LIQUID AND VAPOR COMPOSITIONS, SPECIATED PROCESS EMISSIONS, AND SPECIFIC REACTIVITY DATA

Appendix A contains speciation data on gasoline formulations, alcohol blends, and various process emissions. The specific reactivity values in Section 3 are based on the compositions in this Appendix as described below.

SPECIATION DATA SET 1

ARB determined the composition of RF-A, Phase 2 gasoline, M85, and E85 fuels and vapors. The ozone potential is reported in Section 3 and the speciations are included in this appendix. The test conditions and testing procedures are also included.

- July 1994 liquid fuel compositions (Table 3-3)
- July 1994 vapor compositions (Table 3-4)

SPECIATION DATA SET 2

Speciation data for emission sources in Table 3-7 are shown below. Speciations for various gasoline formulations are shown to provide insight into the variability in gasoline composition and the effect on ozone potential. The speciation for indolene is shown to provide insight into evaporative emission data collected for indolene. The speciations for Auto/Oil compositions that are reported in Table 3-7 are not shown in this Appendix. These data are available from other sources.

- Vapor and Liquid Gasoline Speciation (Harley, 1992)
- Vapor and Liquid Gasoline and Indolene Speciation (Furey, 1986)
- ARCO Gasoline Speciations (Boekhaus, Mar. 1991)
- EPA SPECIATE Data Base, Related Process Emissions
- Surrogate for diesel fuel composition based on analysis by hydrocarbon class

ARB's database of specific reactivity values for industrial processes is included. These specific reactivity values do not include methane and are consistent with other values in this study. A listing of codes and reactivity factors for organic compounds is also included. The chemical abstract service (CAS) number and SAROAD code are often used to identify compounds. The SAPRC reactivity factors are the same as the ARB factors. The carbon bond mechanism (CBM) factors are also shown. This information provides a useful reference for identifying components and relating them to reactivity factors.

- ARB Specific Reactivity Data Base
- Ozone Potential Factors - for SAPRC and CBM mechanisms

SPECIATION DATA SET 3

ARB determined the composition of RF-A, Phase 2 gasoline under more controlled test conditions. The ozone potential is reported in Section 3 and the speciations are included in this appendix. The test conditions and testing procedures are also included.

- August 1995 Vapor Compositions (Table 3-5)

SPECIATION DATA SET 1

- Vapor Composition Test Data Summary
- Test Procedure for Vapor Sampling
- Phase 2 Drum Vapor Data
- Phase 2 Vehicle Vapor Data
- RF-A Drum Vapor Data
- RF-A Vehicle Vapor Data
- M85 Drum Vapor Data
- M85 Vehicle Vapor Data
- E85 Drum Vapor Data
- E85 Vehicle Vapor Data
- Phase 2 Liquid Data
- RF-A Liquid Data
- Phase 2 Liquid Data
- RF-A Liquid Data
- M85 Liquid Data
- E85 Liquid Data
- E85 Liquid Data
- Average of Vapor Composition Data

PHASE 2 FUEL DRUM
PH2 FUEL LOT# 316

VAPOR COMPOSITION TEST DATA

FUEL DRUM

PROJECT# 2R9408

		Fuel Drum							SHED				Liq. Samples
Date	Time	Fuel Level	Gal.	Gal. to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm)	SHED HC (ppm)	SHED VOL. (cu. ft.)	Sample ID# (take 2)
6/28/94	9:15	Full	54	0.0	87.0	75.0	94.0	0.88	VR5	2.32	4.03	1841.0	PH2-100
									VR6		22.10	1847.1	
	600 ml VAPOR SAMPLES								VR7		22.10	1847.1	
									VR8		22.10	1847.1	
6/28/94	11:05	80%	43.2	10.8	90.0	80.0	109.0	1.00	VR9	2.12	3.58	1840.0	PH2-80
									VR10		20.60	1838.1	
	600 ml VAPOR SAMPLES								VR11		20.60	1838.1	
									VR12		20.60	1838.1	
6/29/94	9:45	40%	21.6	21.6	84.0	75.0	99.0	0.63	VR13	2.35	3.85	1844.5	PH2-40
									VR14		20.10	1845.0	
	600 ml VAPOR SAMPLES								VR15		20.10	1845.0	
									VR16		20.10	1845.0	
7/01/94	9:47	10%	5.4	16.2	90.0	84.0	101.0	0.50	VR17	2.14	3.57	1830.0	PH2-10
									VR18		19.50	1825.5	
	600 ml VAPOR SAMPLES								VR19		19.50	1825.5	
									VR20		19.50	1825.5	

FUEL TANK - VW JETTA
PHASE 2 FUEL LOT #316

VAPOR COMPOSITION TEST DATA

VEHICLE TANK

PROJECT# 2R9408

Date	Time	Fuel Tank - VW Jetta: Fuel Level	Gallons	Gallons to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	SHED: Test ID#	Bkgd Meth (ppm) (ppm)	SHED HC (ppm) (ppm)	SHED VOL. (cu. ft.)	Liq. Samples: Sample ID# (take 2)
7/1/94	11:27	Full	14.5	0.0	85	90	93	0.25	VR21	2.1	3.63	1840.0	PH2-100-VW
									VR22		26.67	1825.0	
	600 ml VAPOR SAMPLES								VR23		26.67	1825.0	
									VR24		26.67	1825.0	
7/5/94	10:00	80%	11.6	2.9	72	82	82	0.25	VR25	1.92	2.60	1840.0	PH2-80-VW
									VR26		19.30	1840.0	
	600 ml VAPOR SAMPLES								VR27		19.30	1840.0	
									VR28		19.30	1840.0	
7/5/94	11:47	40%	5.8	5.8	83	96	89	0.00	VR29	1.98	2.69	1840.0	PH2-40-VW
									VR30		21.92	1844.0	
	600 ml VAPOR SAMPLES								VR31		21.92	1844.0	
									VR32		21.92	1844.0	
7/5/94	2:04	10%	3.0	ALL	88	102	96	0.00	VR33	1.99	2.82	1840.0	PH2-10-VW
									VR34		23.30	1840.0	
	600 ml VAPOR SAMPLES								VR35		23.30	1840.0	
									VR36		23.30	1840.0	

8/30/94

VRJETTA.XLS

RFA FUEL DRUM
RFA FUEL LOT# 424

VAPOR COMPOSITION TEST DATA

FUEL DRUM

PROJECT# 2R9408

Date	Time	Fuel Level	Gal.	Gal. to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm)	SHED HC (ppm)	SHED VOL. (cu. ft.)	Liq. Samples Sample ID# (take 2)
		Fuel Drum							SHED				
7/11/94	8:40	80%	43.2	10.8	70.0	69.0	74.0	0.63	VR37	2.18	3.11	1846.5	RFA-DRUM
									VR38		18.24	1848.4	
	600 ml VAPOR SAMPLES								VR39		18.24	1848.4	
									VR40		18.24	1848.4	
7/12/94	9:55	40%	21.6	21.6	80.0	68.0	94.0	0.38	VR45	2.23	3.50	1840.9	
									VR46		22.89	1841.4	
	600 ml VAPOR SAMPLES												
7/11/94	10:00	40%	21.6	21.6	80.0	73.0	99.0	0.50	VR41	2.23	3.63	1845.1	
	LOW SHED HC PPM								VR42		12.38	1846.4	
	600 ml VAPOR SAMPLES								VR43		12.38	1846.4	
									VR44		12.38	1846.4	
7/12/94	1:00	10%	5.4	16.2	90.0	81.0	101.0	0.88	VR49	2.14	3.00	1840.8	
	600 ml VAPOR SAMPLES								VR50		29.05	1842.0	
7/12/94	10:48	10%	5.4	16.2	79.0	76.0	100.0	0.00	VR47	2.22	3.22	1841.6	
	600 ml VAPOR SAMPLES								VR48		22.52	1840.1	
	NO PRESSURE												

FUEL TANK - VW JETTA
RFA FUEL LOT# 424

VAPOR COMPOSITION TEST DATA

VEHICLE TANK

Project# 2R9408

Date	Time	Fuel Level	Gallons	Gallons to [illegible]	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm)	SHED HC (ppm)	SHED VOL. (cu. ft.)
		Fuel Tank - VW Jetta							SHED			
7/12/94	1:55	80%	11.6	2.9	88	91	93	0.31	VR51	2.03	3.05	1843.7
									VR52		32.56	1846.2
	600 ml VAPOR SAMPLES											
7/13/94	8:00	40%	5.8	5.8	65	78	74	0.25	VR53	2.11	2.54	1840.9
									VR54		24.92	1846.5
	600 ml VAPOR SAMPLES											
7/13/94	9:10	10%	3.0	ALL	66	82	77	0.25	VR55	2.08	1.98	1842.9
									VR56		22.67	1846.2
	600 ml VAPOR SAMPLES											

METHANOL M85 FUEL DRUM
M85 FUEL

VAPOR COMPOSITION TEST DATA

FUEL DRUM

PROJECT# 2R9408

		Fuel Drum							SHED				Liq. Samples
Date	Time	Fuel Level	Gal.	Gal. to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm)	SHED HC (ppm)	SHED VOL. (cu. ft.)	Sample ID# (take 2)
7/13/94	10:30	80%	43.2	10.8	76.0	69.0	94.0	0.38	VR57	2.10	2.88	1843.7	M85-DRUM
	600 ml VAPOR SAMPLES								VR58		11.45	1843.7	
7/18/94	10:55	40%	21.6	21.6	72.9	70.7	84.3	0.38	VR59	2.23	3.55	1845.8	
	600 ml VAPOR SAMPLES								VR60		14.15	1842.9	
7/18/94	12:53	10%	5.4	16.2	83.0	85.5	109.0	0.38	VR61	2.26	3.21	1841.0	
	600 ml VAPOR SAMPLES								VR62		12.55	1845.8	
8/02/94	7:00	10%	5.4	16.2	68.9	68.0	67.0	0.00	VR83	2.51	4.01	1839.6	
	1000 ml VAPOR SAMPLES								VR84		17.42	1835.3	
	NO PRESSURE												

VAPOR COMPOSITION TEST DATA

FUEL TANK - VW JETTA
METHANOL M85 FUEL

VEHICLE TANK

Project# 2R9408

Fuel Tank - VW Jetta									SHED			
Date	Time	Fuel Level	Gallons	Gallons to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm) (ppm)	SHED HC (ppm) (ppm)	SHED VOL. (cu. ft.)
7/18/94	10:00	80%	11.6	2.9	69.8	73.8	77.2	0.25	VR63	2.34	3.27	1844.6
	600 ml VAPOR SAMPLES								VR64		14.92	1843.7
7/18/94	2:15	40%	5.8	5.8	84.2	87.9	90.9	0.13	VR65	2.02	3.02	1841.6
	1000 ml VAPOR SAMPLES								VR66		27.49	1831.8
7/19/94	7:48	10%	3.0	ALL	66.3	77.6	74.7	0.00	VR67	2.13	2.93	1843.8
	1000 ml VAPOR SAMPLES								VR68		16.11	1848.6

ETHANOL E85 FUEL DRUM
E85 FUEL

VAPOR COMPOSITION TEST DATA

FUEL DRUM

PROJECT# 2R9408

		Fuel Drum							SHED				Liq. Samples
Date	Time	Fuel Level	Gal.	Gal. to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm)	SHED HC (ppm)	SHED VOL. (cu. ft.)	Sample ID# (take 2)
7/19/94	9:26	80%	43.2	10.8	69.0	70.6	76.4	0.63	VR69	2.13	2.96	1841.5	E85-DRUM
	1000 ml VAPOR SAMPLES								VR70		26.38	1846.6	
7/19/94	10:45	40%	21.6	21.6	80.0	73.5	99.2	0.44	VR71	2.27	3.07	1847.3	
	1000 ml VAPOR SAMPLES								VR72		20.05	1846.0	
7/19/94	1:16	10%	5.4	16.2	84.2	82.1	98.3	0.25	VR73	2.18	3.34	1844.0	
	1000 ml VAPOR SAMPLES								VR74		20.95	1839.9	
7/19/94	2:08	10%	5.4	0.0	84.3	82.5	96.1	0.00	VR80	2.14	3.60	1840.6	
	1000 ml VAPOR SAMPLES								VR81		21.94	1833.5	
	NO PRESSURE												

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8/30/94

VRDRUM.XLS

FUEL TANK - VW JETTA
ETHANOL E85 FUEL

VAPOR COMPOSITION TEST DATA

VEHICLE TANK

Project# 2R9408

		Fuel Tank - VW Jetta							SHED			
Date	Time	Fuel Level	Gallons	Gallons to Remove	Ambient Temp (F)	Liquid Temp (F)	Vapor Temp (F)	Vapor Press (psi)	Test ID#	Bkgd Meth (ppm) (ppm)	SHED HC (ppm) (ppm)	
7/22/94	8:20	80%	11.6	2.9	72	75	77	0.25	VR75	2.67	4.00	1840.6
									VR76		29.60	1845.0
	1000 ml VAPOR SAMPLES											
7/22/94	10:00	40%	5.8	5.8	82	84	81	0.25	VR77	2.37	3.47	1841.1
									VR78		32.31	1848.7
	1000 ml VAPOR SAMPLES											
7/26/94	7:50	10%	3.0	ALL	75	83	74	0.13	VR79	2.71	4.15	1841.0
									VR80		26.89	1845.9
	1000 ml VAPOR SAMPLES											

8/30/94

VRJETTA.XLS

MEMORANDUM

TO: Stefan Unnasch, Acurex
FROM: Wayne McMahon, Manager, Eng. Testing Section, CARB

DATE: September 8, 1994
SUBJECT: Acurex - Composition of Fuel Tank Head Space Vapor

Introduction

The Engineering Testing Section (ETS) was requested to assist Acurex in ARB's contracted fuel cycle emission study. In order to determine the fuel and head space vapor composition, ETS collected for speciation analysis liquid fuel and head space fuel vapor samples from Phase 2, RF-A, M85, and E85 gasolines. These samples were taken from a 55-gallon fuel drum and a vehicle fuel tank at four drum and fuel tank levels. Methanol and ethanol vapor samples were collected using impingers. Liquid and vapor speciation was performed by Gas Chromatography. Monitoring and Laboratory Division (MLD) performed vapor speciation analysis. Q.C. Special Testing Section (QC) analyzed the liquid fuel for RVP, distillation curve, and specific gravity.

The following describes the test equipment and general methods. A detailed test procedure is attached.

Project Number

The project number is 2R9408.

Project Engineer

John Purnell is the project engineer for this study. His hours are Monday through Thursday from 7:15 am to 5:45 pm, and he can be reached at 818-575-6650.

Test Vehicle

ARB's 1991 VW FFV Jetta was used for testing. To measure liquid fuel and head space vapor temperatures and head space pressure, a new OEM fuel tank was equipped with temperature and pressure sensors and a fuel drain was installed at the low point of the tank to ensure complete fuel draining. All measurements and vapor samples were taken with the OEM fuel cap installed.

Test Drum

A conventional 55 gallon fuel drum was used for testing. A special test cap was constructed so that liquid and vapor temperatures and vapor samples could be collected at any fuel level in the drum. The vapor sample line was also used to measure vapor pressure in the drum.

Test Fuels

The test fuels were: Phase 2 certification gasoline, RF-A gasoline, M85, and E85. All fuels were made to emission certification fuel specifications. The M85 and E85 fuels contained Phase 2 gasoline as the hydrocarbon stock.

Vapor Samples

Initially, four fuel levels were to be examined: 100%, 80%, 40%, and 10%. Due to time constraints, only Phase 2 fuel was tested at the full-level condition.

To determine the repeatability of sampling and analysis, three identical dilute samples were taken for GC analysis for all the Phase 2 tests and the first two levels of the RFA drum tests.

Background air samples and dilute vapor samples were speciated to calculate the net concentration of the vapor samples.

Vapor Sampling and Dilution

The vapor sampling and dilution procedure included four major steps:

1. Vapor Sampling- drawing the high concentration vapor sample from the source (drum or car) into a tedlar bag.
2. Sample Dilution- diluting the high concentration vapor sample in the SHED.
3. Dilute Vapor Sampling- drawing the dilute sample from the SHED into a tedlar bag.
4. Dilute Vapor Speciation- delivering the dilute sample to the laboratory for speciation analysis.

The detailed sampling and dilution procedure can be found in Attachment I.

1. Vapor Sampling

The vapor samples from the drum were released directly into a tedlar sample bag using the pressure that built up in the drum. Some tests were performed with the drum at zero pressure. The pressure was released from the drum and the vapor sample was drawn out using a 1 liter vapor syringe.

The vapor syringe was also used to draw samples from the test car fuel tank because there was too little pressure to fill the sample bag.

2. Sample Dilution

To reduce the vapor concentration for chromatographic analysis, the Sealed Housing for Evaporative Determination (SHED) was used to dilute the high concentration vapor samples from approximately 500,000 ppmC to 30 ppmC.

The vapor syringe was used to transfer the sample from the tedlar bag to the SHED for dilution.

Before the vapor sample was injected into the SHED, a dilution air sample was collected so background dilution air constituents could be subtracted from the diluted sample.

3. Dilute Vapor Sampling

After being diluted, the sample was pumped from the SHED into a tedlar sample bag using an electric vacuum pump. Before connecting the pump to the tedlar bag, the pump and connection lines were purged with the dilute sample from the SHED.

4. Dilute Vapor Speciation

After being transferred into a tedlar bag, the dilute sample was taken to the laboratory for speciation analysis.

Alcohol Sampling

Glass impingers were used to collect methanol and ethanol samples from the diluted M85 and E85 vapor samples. A large volume tedlar bag was filled with vapor from the SHED after dilution, and the vapor was pumped through an alcohol sampling cart. Impingers mounted on the cart trapped the corresponding alcohol component and the concentration was determined by gas chromatography.

Liquid Fuel Sampling

Two one-quart samples of liquid gasoline were collected from each fuel drum. QC analyzed one sample for RVP, distillation curve, and specific gravity. These data are pending and should be available Wednesday, September 7. The other liquid sample was speciated by MLD/IAS.

Data Identification

The samples may be identified by their unique 3-part code number. An asterisk at the end of a fuel drum test, e.g. DR*, indicates a test where pressure was released from the fuel drum before the sample was taken. In this case, the vapor sample was drawn out of the drum with the syringe just as the "VW-" tests. The identification codes are as follows:

1. FUEL

PH2 - Phase II certification fuel

RFA - Reformulated Fuel A

M85 - Methanol fuel (85% Methanol, 15% PH2)

E85 - Ethanol fuel (85% Ethanol, 15% PH2)

2. FUEL LEVEL

100, 80, 40, & 10 - denotes fuel level

3. VAPOR SOURCE

DR - denotes samples from the Fuel drum

VW - denotes samples from the Volkswagen FFV Jetta

E.g. PH2-80-DR indicates the sample is a Phase II fuel test, with the fuel drum filled to 80% full level.

Attachment I - Vapor Sampling and Dilution Procedures

Attachment I is a detailed description of how the tests were performed.

Attachment II - Fuel Analysis Report

Attachment II shows RVP and Distillation Curve results from QC analysis of all four fuels.

Attachment III - Sample Identification

Attachment III is a sample reference list detailing test dates, tedlar sample bag ID number used in the laboratory, and sample type.

Attachment IV - SHED Pressures and Temperatures

Attachment IV is a list of barometric pressures and ambient temperatures inside the SHED during sample dilution. These values are averages over the 10 minute dilution cycle.

Attachment V - Data Sheets

Attachment V contains the individual data records showing test information, temperatures, drum/tank pressure, sample volumes injected into SHED, SHED volumes, and background methane readings.

Attachment VI - Individual Mass Conc. & Weight Percent Comparisons

Attachment VI is a summary of results by mass concentration and weight percent for each sample type, e.g. ethanol fuel from the drum at 80% full (E85-80-DR). There are 8 parts to Att. VI, one for each Fuel/Vessel

combination, e.g. ethanol & drum, methanol & car, etc... These Excel spreadsheet files are also provided on computer diskette.

Attachment VII - PPBC & Percent of Total Comparison

Attachment VII is a comparison of each Fuel/Vessel by ppbC and percent of total. This Excel spreadsheet file is also provided on computer diskette.

Computer Diskettes

Two computer diskettes contain spreadsheets with all valid speciation results. Data are reported in ppbC, ppb, and weight percent. Results are separated by test type. See attachments VI & VII.

Comments

The dilute sample results have been corrected for background All consistent data are reported. Tests with alcohol results that were not consistent with other tests for the same fuel have been omitted. Likewise, tests with vapor speciation results inconsistent with other similar fuel tests have been omitted and should not be included in any data analysis.

ATTACHMENT I

Vapor Sampling and Dilution Procedures

I. Fuel Drum - Liquid and Vapor Sampling Procedure

Record measurements and collect liquid and vapor samples at 100%, 80%, 40%, and 10% fuel levels for all four fuels, as described below:

A. Open a new drum of fuel and install the drum test cap. Allow the drum to sit outside in the Fuels Area, under the canopy and out of direct sunlight, until vapor pressure is at least 0.5 psi.

1. Record the ambient, liquid fuel, and vapor temperatures and vapor pressure on data sheet.
2. Collect a vapor sample in a small tedlar bag and dilute according to Dilution Procedure.
3. Collect two 1-quart liquid samples.

   Liquid Samples:

   Store samples in the refrigerator until they can be analyzed.
   QC will determine RVP, distillation curve, Inorganic Analysis Section (MLD/IAS) speciated the other liquid sample.

4. Drain fuel from drum to the next fuel level and install test cap.
   Agitate fuel drum to promote mixing.
5. Allow the drum to sit until pressure reaches at least 0.5 psi.

B. Repeat steps 1. through 5. for 80%, 40% and 10% drum fuel levels.

C. 10% drum fuel level NO PRESSURE tests

For each fuel at the 10% full level, use the syringe to draw a sample from the drum after releasing all pressure. These tests are marked with an asterisk , e.g. DR*.

II. Vehicle Fuel Tank - Liquid and Vapor Sampling Procedure

Record measurements and collect samples at 100%, 80%, 40%, and 10% fuel tank levels for all four fuels as described below:

A. Condition vehicle with test fuel

1. Drain fuel tank through the drain valve.
2. Add 2 gallons of test fuel and drive vehicle 5 miles. Drain fuel.
3. Add test fuel to 100% fuel tank capacity as specified by the manufacturer. Do not top off.
4. The OEM fuel cap must be in place during all testing.

B. Vapor Sampling

1. Drive the car on the road for 25 miles. Park vehicle for 2 minutes. Do not open the fuel cap.
2. Record ambient, fuel, and vapor temperatures and head space vapor pressure on data sheet.
3. Connect syringe to sample port and collect 600 ml of vapor.
4. Inject sample into SHED, flush syringe twice.
4. Dilute sample in SHED according to Dilution Procedures.
5. Drain fuel to the next fuel level.

C. Repeat steps A. through B. for 80% and 40% tank fuel levels.

D. To test at 10% fuel level:

1. Completely drain fuel tank.
2. Refill with 3 gallons of test fuel.
3. Follow steps 1. through 5.

(Step D. was necessary to maintain the 10% fuel level after on-road conditioning.)

III. Dilution Procedure

Vapor samples will be diluted in the SHED to approximately 30 ppm as described below:

1. Close the SHED and record initial SHED readings (HC, temp, volume, etc...).
2. Take background sample in tedlar bag.
3. Record methane concentration from the background sample.
4. Transfer a 600 ml vapor sample to the SHED using the large syringe. To ensure complete sample transfer, purge the syringe twice after injection before disconnecting it from the SHED injection port.
5. Run 10 minute SHED mixing program to obtain a stable HC reading.
6. Record final SHED readings.
7. Draw diluted samples from the SHED.
8. Deliver bags to MLD for vapor speciation, or use vapor sample in alcohol sampling cart.
9. Typical SHED volume was 1844 cubic feet

ATTACHMENT 2

CAL-EPA * AIR RESOURCES BOARD * MOBILE SOURCE DIVISION
QUALITY CONTROL & SPECIAL TESTING SECTION

FUEL ANALYSIS REPORT FOR PROJECT 2R9408
9/7/94

SAMPLE I.D.	RVP (psi)	DISTILLATION (deg. F)				
		I.P.	10%	50%	90%	E.P.
PH2 - LOT 316	6.60	100	140	209	297	394
RFA - LOT 424	8.65	90	124	214	333	418
M85 - LOT 880	7.20	123	143	147	148	152
E85	7.75	110	160	171	172	175

9/8/94

ATTACHMENT 3

VAPOR COMPOSITION DATA - PROJECT 2R9408 - SAMPLE IDENTIFICATION

DATE	GC?	ID#	SAMPLE
6/28/94	X	VR5	PH2-100-DR
6/28/94	X	VR6	PH2-100-DR
6/28/94	X	[illegible]	PH2-100-DR
6/28/94	X	[illegible]	PH2-100-DR
6/28/94	X	VR9	PH2-80-DR
6/28/94	X	VR10	PH2-80-DR
6/28/94	X	VR11	PH2-80-DR
6/28/94	X	VR12	PH2-80-DR
6/29/94	X	VR13	PH2-80-DR
6/29/94	X	VR14	PH2-80-DR
6/29/94	X	VR15	PH2-80-DR*
6/29/94	X	VR16	PH2-80-DR
7/1/94	X	VR17	PH2-10-DR
7/1/94	X	VR18	PH2-10-DR
7/1/94	X	VR19	PH2-10-DR
7/1/94	X	VR20	PH2-10-DR
7/1/94	X	VR21	PH2-100-VW
7/1/94	X	VR22	PH2-100-VW
7/1/94	X	VR23	PH2-100-VW
7/1/94	X	VR24	PH2-100-VW
7/5/94	X	VR25	PH2-80-VW
7/5/94	X	VR26	PH2-80-VW
7/5/94	X	VR27	PH2-80-VW
7/5/94	X	VR28	PH2-80-VW
7/5/94	X	VR29	PH2-40-VW
7/5/94	X	VR30	PH2-40-VW
7/5/94	X	VR31	PH2-40-VW
7/5/94	X	VR32	PH2-40-VW
7/5/94	X	VR33	PH2-10-VW
7/5/94	X	VR34	PH2-10-VW
7/5/94	X	VR35	PH2-10-VW
7/5/94	X	VR36	PH2-10-VW
7/11/94	X	VR37	RFA-80-DR
7/11/94	X	VR38	RFA-80-DR
7/11/94	X	VR39	RFA-80-DR
7/11/94	X	VR40	RFA-80-DR
7/11/94	X	VR41	RFA-40-DR**
7/11/94	X	VR42	RFA-40-DR**
7/11/94	X	VR43	RFA-40-DR**
7/11/94	X	VR44	RFA-40-DR**
7/12/94	X	VR45	RFA-40-DR
7/12/94	X	VR46	RFA-40-DR
7/12/94	X	VR47	RFA-10-DR*
7/12/94	X	VR48	RFA-10-DR*
7/12/94	X	VR49	RFA-10-DR
7/12/94	X	VR50	RFA-10-DR
7/12/94	X	VR51	RFA-80-VW
7/12/94	X	VR52	RFA-80-VW
7/13/94	X	VR53	RFA-40-VW
7/13/94	X	VR54	RFA-40-VW
7/13/94	X	VR55	RFA-10-VW
7/13/94	X	VR56	RFA-10-VW
7/13/94	X	VR57	M85-80-DR
7/13/94	X	VR58	M85-80-DR
7/18/94	X	VR59	M85-40-DR
7/18/94	X	VR60	M85-40-DR
7/18/94	X	VR61	M85-10-DR
7/18/94	X	VR62	M85-10-DR
7/18/94	X	VR63	M85-80-VW
7/18/94	X	VR64	M85-80-VW
7/18/94	X	VR65	M85-40-VW
7/18/94	X	VR66	M85-40-VW
7/19/94	X	VR67	M85-10-VW
7/19/94	X*	VR68	M85-10-VW
7/19/94	yes alc	VR69	E85-80-DR
7/19/94	no gc	VR70	E85-80-DR
7/19/94	X	VR71	E85-40-DR
7/19/94	X	VR72	E85-40-DR
7/19/94	X	VR73	E85-10-DR
7/19/94	X	VR74	E85-10-DR
7/19/94	no gc	VR80	E85-10-DR*
7/19/94	data	VR81	E85-10-DR*
7/20/94	bkg	VR82	M85-10-DR*
7/20/94	sam	VR82	M85-10-DR*
7/22/94	X	VR75	E85-80-VW
7/22/94	X	VR76	E85-80-VW
7/22/94	X	VR77	E85-40-VW
7/22/94	X	VR78	E85-40-VW
7/26/94	X	VR79	E85-10-VW
7/26/94	X	VR80	E85-10-VW
8/2/94	X	VR83	M85-10-DR*
8/2/94	X	VR84	M85-10-DR*

LIQUID FUEL SAMPLES

DATE	FUEL	MLD
7/21/94	PH2	
7/21/94	RFA	
7/21/94	M85	
7/21/94	E85	

DATE	FUEL	QC
8/30/94	PH2	
8/30/94	RFA	
8/30/94	M85	
8/30/94	E85	

ABBREVIATIONS:

VR - VAPOR RECOVERY SAMPLE

VW - SAMPLES FROM VW JETTA

DR - SAMPLES FROM FUEL DRUM

ABBREVIATIONS:

NUMBER INDICATES TANK/DRUM FUEL LEVEL

* NO PRESSURE (PER INSTRUCTIONS)

** LOW SHED HC READING

SORTVR.XLS

ATTACHMENT 4

ACUREX FUEL COMPOSITION STUDY

SHED Pressures and Temperatures

SAMPLE ID	BAR. PRESS in. Hg.	END TEMP (SA) F
VR2	29.59	72.0
VR3	29.59	72.2
VR5-8	29.67	72.3
VR9-12	29.68	72.0
VR13-16	29.72	72.2
VR17-20	29.65	71.9
VR21-24	29.62	72.3
VR25-28	29.65	72.1
VR29-32	29.71	71.6
VR33-36	29.68	70.9
VR37-40	29.75	72.4
VR41-44	29.75	71.6
VR45-46	29.70	72.3
VR47-48	29.70	72.1
VR49-58	N/A	N/A
VR59-60	29.76	72.4
VR61-62	29.74	72.0
VR63-64	29.76	72.4
VR65-66	29.73	74.0
VR67-68	29.76	71.7
VR69-70	29.76	71.9
VR71-72	29.77	NA
VR73-74	29.74	72.1
VR75-79	N/A	N/A
VR80-81	29.72	72.9
VR82	N/A	N/A
VR83-84	29.65	71.6

Vapor Composition
Mass Concentration
PH2-Drum

	A	B	C	D	E	F	G
1		PH2-100-	PH2-40-	PH2-10-	PH2-100-	PH2-40-	PH2-10-
2		DR	DR	DR	DR	DR	DR
3	LIGHT END HYDROCARBONS	VR5	VR13	VR17	VR5	VR13	VR17
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.			
5		ug/ml	ug/ml	ug/ml	Weight %	Weight %	Weight %
6	ethane	13	0	0	0%	0%	0%
7	ethene	0	0	0	0%	0%	0%
8	propane	49	20	15	0%	0%	0%
9	propene	0	0	0	0%	0%	0%
10	methylpropane	0	119	117	0%	1%	1%
11	ethyne	103	0	0	1%	0%	0%
12	n-butane	1256	1414	1349	12%	13%	14%
13	propadiene	0	0	0	0%	0%	0%
14	trans-2-butene	35	38	36	0%	0%	0%
15	1-butene	9	9	0	0%	0%	0%
16	2-methylpropene	20	16	13	0%	0%	0%
17	cis-2-butene	39	42	40	0%	0%	0%
18	2,2-dimethylpropane	12	14	13	0%	0%	0%
19	methylbutane	3104	3418	3330	29%	32%	34%
20	1-propyne	0	0	0	0%	0%	0%
21	n-pentane	450	460	449	4%	4%	5%
22	1,3-butadiene	0	0	0	0%	0%	0%
23	3-methyl-1-butene	26	9	0	0%	0%	0%
24	cyclopentene	0	14	14	0%	0%	0%
25	trans-2-pentene	81	80	78	1%	1%	1%
26	2-methyl-2-butene	140	107	104	1%	1%	1%
27	1-pentene	0	34	33	0%	0%	0%
28	2-methyl-1-butene	61	61	59	1%	1%	1%
29	cis-2-pentene	43	44	41	0%	0%	0%
30	1-buten-3-yne	0	0	0	0%	0%	0%
31	2-butyne	0	0	0	0%	0%	0%
32	1-butyne	0	0	0	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0%	0%	0%
44	Light End	5440	5897	5691	50%	56%	57%
45							
46							
47	MID-RANGE HYDROCARBONS						
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.			
49		ug/ml	ug/ml	ug/ml	Weight %	Weight %	Weight %
50	2-methyl-1,3-butadiene	0	0	0	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0%	0%	0%
52	1,3-pentadiene	0	0	0	0%	0%	0%
53	cyclopentadiene	0	0	0	0%	0%	0%
54	2,2-dimethylbutane	97	112	100	1%	1%	1%
55	3-methyl-1-pentene	11	0	11	0%	0%	0%
56	cyclopentane	8	19	22	0%	0%	0%
57	2,3-dimethylbutane	201	227	200	2%	2%	2%
58	1-methyl-tert-butyl-ether	1803	1371	1385	17%	13%	14%
59	2-methylpentane	382	539	418	4%	5%	4%
60	4-methyl-cis-2-pentene	0	34	16	0%	0%	0%
61	3-methylpentane	162	188	776	1%	2%	8%

Vapor Composition
Mass Concentration
PH2-Drum

	A	B	C	D	E	F	G
62	2-methyl-1-pentene	24	23	0	0%	0%	0%
63	n-hexane	84	83	50	1%	1%	1%
64	trans-3-hexene	12	12	0	0%	0%	0%
65	trans-2-hexene	22	0	0	0%	0%	0%
66	2-methyl-2-pentene	20	16	0	0%	0%	0%
67	3-methylcyclopentene	13	13	0	0%	0%	0%
68	cis-2-hexene	10	9	0	0%	0%	0%
69	3-methyl-cis-2-pentene	16	0	0	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0%	0%	0%
71	methylcyclopentane	50	61	56	0%	1%	1%
72	2,4-dimethylpentane	157	165	145	1%	2%	1%
73	2,2,3-trimethylbutane	0	0	0	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0%	0%	0%
76	benzene	81	76	58	1%	1%	1%
77	3-methyl-1-hexene	0	0	0	0%	0%	0%
78	3,3-dimethylpentane	0	10	0	0%	0%	0%
79	cyclohexane	0	0	0	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0%	0%	0%
81	2-methylhexane	282	0	0	3%	0%	0%
82	2,3-dimethylpentane	0	268	227	0%	3%	2%
83	cyclohexene	0	0	12	0%	0%	0%
84	3-methylhexane	58	56	43	1%	1%	0%
85	1-heptene	0	0	0	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	12	10	10	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	9	0	0	0%	0%	0%
88	3-ethylpentane	14	10	0	0%	0%	0%
89	2,2,4-trimethylpentane	382	319	261	4%	3%	3%
90	3-methyl-trans-3-hexene	0	0	0	0%	0%	0%
91	n-heptane	41	0	10	0%	0%	0%
92	2-methyl-trans-2-hexene	0	0	0	0%	0%	0%
93	trans-2-heptene	0	0	0	0%	0%	0%
94	2-methyl-cis-2-hexene	0	0	0	0%	0%	0%
95	cis-2-heptene	0	0	0	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0%	0%	0%
97	methylcyclohexane	17	15	11	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0%	0%	0%
100	2,5-dimethylhexane	44	15	13	0%	0%	0%
101	2,4-dimethylhexane	46	27	18	0%	0%	0%
102	3,3-dimethylhexane	0	0	0	0%	0%	0%
103	2,3,4-trimethylpentane	106	63	40	1%	1%	0%
104	toluene	332	225	164	3%	2%	2%
105	2,3,3-trimethylpentane	0	0	0	0%	0%	0%
106	2,3-dimethylhexane	43	42	18	0%	0%	0%
107	2-methylheptane	53	35	10	0%	0%	0%
108	3-methylheptane	47	26	0	0%	0%	0%
109	2,2,5-trimethylhexane	53	15	9	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0%	0%	0%
111	octenes	0	0	0	0%	0%	0%
112	n-octane	27	0	0	0%	0%	0%
113	trans-2-octene	0	0	0	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
115	cis-2-octene	0	0	0	0%	0%	0%
116	2,3,5-trimethylhexane	9	0	0	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0%	0%	0%
118	2,6-dimethylheptane	0	0	0	0%	0%	0%
119	3,5-dimethylheptane	11	0	0	0%	0%	0%
120	ethylbenzene	129	89	28	1%	1%	0%
121	2,3-dimethylheptane	0	0	0	0%	0%	0%
122	m- & p-xylene	265	208	57	2%	2%	1%

Vapor Composition
Mass Concentration
PH2-Drum

	A	B	C	D	E	F	G
123	4-methyloctane	12	11	0	0%	0%	0%
124	3-methyloctane	0	0	0	0%	0%	0%
125	styrene (ethenylbenzene)	10	0	0	0%	0%	0%
126	o-xylene	85	66	17	1%	1%	0%
127	2,2,4-trimethylheptane	16	0	0	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0%	0%	0%
129	n-nonane	9	0	0	0%	0%	0%
130	(1-methylethyl)benzene	0	0	0	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0%	0%	0%
135	n-propylbenzene	13	15	0	0%	0%	0%
136	1-methyl-3-ethylbenzene	18	42	14	0%	0%	0%
137	1-methyl-4-ethylbenzene	18	22	0	0%	0%	0%
138	1,3,5-trimethylbenzene	17	19	0	0%	0%	0%
139	1-methyl-2-ethylbenzene	3	14	0	0%	0%	0%
140	1,2,4-trimethylbenzene	14	45	9	0%	0%	0%
141	n-decane	0	0	0	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0%	0%	0%
145	1,2,3-trimethylbenzene	0	16	8	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0%	0%	0%
147	2,3-dihydroindene (indan)	0	9	0	0%	0%	0%
148	1,3-diethylbenzene	0	0	0	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0%	0%	0%
150	1,4-diethylbenzene	0	0	0	0%	0%	0%
151	1-methyl-3-n-propylbenzene	0	10	0	0%	0%	0%
152	(1,1-dimethylethyl)benzene	8	9	0	0%	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	0	11	0	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
158	n-undecane (hendecane)	2	0	0	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	0	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	0	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
162	C11 aromatic	0	0	0	0%	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	0	0%	0%	0%
164	n-pentylbenzene	0	0	0	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	8	0	0	0%	0%	0%
166	naphthalene	0	1	0	0%	0%	0%
167	n-dodecane	21	0	0	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0%	0%	0%
171	1-hexene	0	0	0	0%	0%	0%
172	cis-3-hexene	0	0	0	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0%	0%	0%
174	trans-3-heptene	0	0	0	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0%	0%	0%
178	4-methylheptane	0	0	0	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0%	0%	0%
182	1-octene	0	0	0	0%	0%	0%
183	trans-4-octene	0	0	0	0%	0%	0%

Vapor Composition
Mass Concentration
PH2-Drum

	A	B	C	D	E	F	G
184	cis-1,2-dimethylcyclohexane	0	0	0	0%	0%	0%
185	ethylcyclohexane	0	0	0	0%	0%	0%
186	1-nonene	0	0	0	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene***	0	0	0	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0%	0%	0%
194	Mid-Range	5384	4667	4216	50%	44%	43%
195							
196	NMHC	10824	10565	9908	100%	100%	100%
197							
198	ALCOHOLS						
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.			
200		ug/ml	ug/ml	ug/ml	Weight %	Weight %	Weight %
201	Methanol	0	0	0	0%	0%	0%
202	Ethanol	0	0	0	0%	0%	0%
203	Alcohols	0	0	0	0%	0%	0%
204							
205							
206	CARBONYLS						
207	COMPOUND						
208							
209	Formaldehyde	0	0	0	0%	0%	0%
210	Acetaldehyde	0	0	0	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0%	0%	0%
216	Methacrolein	0	0	0	0%	0%	0%
217	Benzaldehyde	0	0	0	0%	0%	0%
218	Crotonaldehdye	0	0	0	0%	0%	0%
219	Valeraldehyde	0	0	0	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0%	0%	0%
221	Hexanal	0	0	0	0%	0%	0%
222	Carbonyls	0	0	0	0%	0%	0%
223							
224	Total NMOG	10824	10565	9908	100%	100%	100%
225							
226	NOTES						
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)						
228	PPB = PPBC / Carbon Number						
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)						
230	Tests with inconsistent results are excluded.						

Vapor Compostion
Mass Concentration
PH2-Vehicle

	A	B	C	D	E	F	G
1		PH2-100-	PH2-80-	PH2-40-	PH2-100-	PH2-80-	PH2-40-
2		VW	VW	VW	VW	VW	VW
3	LIGHT END HYDROCARBONS	VR21	VR25	VR29	VR21	VR25	VR29
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.			
5		ug/ml	ug/ml	ug/ml	Weight %	Weight %	Weight %
6	ethane	1	0	0	0%	0%	0%
7	ethene	1	0	0	0%	0%	0%
8	propane	23	0	13	0%	0%	0%
9	propene	0	0	0	0%	0%	0%
10	methylpropane	142	118	117	1%	1%	1%
11	ethyne	0	0	0	0%	0%	0%
12	n-butane	1633	1400	1450	12%	14%	13%
13	propadiene	0	0	0	0%	0%	0%
14	trans-2-butene	43	36	37	0%	0%	0%
15	1-butene	10	0	9	0%	0%	0%
16	2-methylpropene	16	13	13	0%	0%	0%
17	cis-2-butene	48	41	43	0%	0%	0%
18	2,2-dimethylpropane	17	14	14	0%	0%	0%
19	methylbutane	4190	3517	3768	32%	35%	35%
20	1-propyne	0	0	0	0%	0%	0%
21	n-pentane	569	487	523	4%	5%	5%
22	1,3-butadiene	0	0	0	0%	0%	0%
23	3-methyl-1-butene	10	0	0	0%	0%	0%
24	cyclopentene	18	23	23	0%	0%	0%
25	trans-2-pentene	98	82	86	1%	1%	1%
26	2-methyl-2-butene	128	108	110	1%	1%	1%
27	1-pentene	41	35	37	0%	0%	0%
28	2-methyl-1-butene	74	63	67	1%	1%	1%
29	cis-2-pentene	52	44	47	0%	0%	0%
30	1-buten-3-yne	0	0	0	0%	0%	0%
31	2-butyne	0	0	0	0%	0%	0%
32	1-butyne	0	0	0	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0%	0%	0%
44	Light End	7114	5981	6357	54%	60%	59%
45							
46							
47	MID-RANGE HYDROCARBONS						
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.			
49		ug/ml	ug/ml	ug/ml	Weight %	Weight %	Weight %
50	2-methyl-1,3-butadiene	0	0	0	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0%	0%	0%
52	1,3-pentadiene	0	0	0	0%	0%	0%
53	cyclopentadiene	0	0	0	0%	0%	0%
54	2,2-dimethylbutane	136	114	134	1%	1%	1%
55	3-methyl-1-pentene	9	0	0	0%	0%	0%
56	cyclopentane	20	18	14	0%	0%	0%
57	2,3-dimethylbutane	276	207	245	2%	2%	2%
58	1-methyl-tert-butyl-ether	1488	0	1378	11%	0%	13%
59	2-methylpentane	878	1857	764	7%	19%	7%
60	4-methyl-cis-2-pentene	0	0	0	0%	0%	0%
61	3-methylpentane	225	196	179	2%	2%	2%

Vapor Compostion
Mass Concentration
PH2-Vehicle

	A	B	C	D	E	F	G
62	2-methyl-1-pentene	31	0	0	0%	0%	0%
63	n-hexane	82	20	24	1%	0%	0%
64	trans-3-hexene	0	10	0	0%	0%	0%
65	trans-2-hexene	0	0	0	0%	0%	0%
66	2-methyl-2-pentene	20	0	0	0%	0%	0%
67	3-methylcyclopentene	0	19	0	0%	0%	0%
68	cis-2-hexene	0	0	0	0%	0%	0%
69	3-methyl-cis-2-pentene	0	0	0	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0%	0%	0%
71	methylcyclopentane	78	45	56	1%	0%	1%
72	2,4-dimethylpentane	215	111	134	2%	1%	1%
73	2,2,3-trimethylbutane	0	0	0	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0%	0%	0%
76	benzene	74	61	48	1%	1%	0%
77	3-methyl-1-hexene	0	0	0	0%	0%	0%
78	3,3-dimethylpentane	11	13	0	0%	0%	0%
79	cyclohexane	0	0	0	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0%	0%	0%
81	2-methylhexane	0	0	0	0%	0%	0%
82	2,3-dimethylpentane	359	155	229	3%	2%	2%
83	cyclohexene	0	0	0	0%	0%	0%
84	3-methylhexane	71	46	39	1%	0%	0%
85	1-heptene	0	0	0	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	13	16	9	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	10	12	0	0%	0%	0%
88	3-ethylpentane	12	10	0	0%	0%	0%
89	2,2,4-trimethylpentane	475	287	346	4%	3%	3%
90	3-methyl-trans-3-hexene	0	0	0	0%	0%	0%
91	n-heptane	0	14	12	0%	0%	0%
92	2-methyl-trans-2-hexene	0	0	0	0%	0%	0%
93	trans-2-heptene	0	0	0	0%	0%	0%
94	2-methyl-cis-2-hexene	0	0	0	0%	0%	0%
95	cis-2-heptene	0	0	0	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0%	0%	0%
97	methylcyclohexane	19	10	12	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0%	0%	0%
100	2,5-dimethylhexane	24	17	9	0%	0%	0%
101	2,4-dimethylhexane	44	18	10	0%	0%	0%
102	3,3-dimethylhexane	0	22	0	0%	0%	0%
103	2,3,4-trimethylpentane	106	26	21	1%	0%	0%
104	toluene	371	322	315	3%	3%	3%
105	2,3,3-trimethylpentane	0	0	0	0%	0%	0%
106	2,3-dimethylhexane	49	45	34	0%	0%	0%
107	2-methylheptane	30	33	24	0%	0%	0%
108	3-methylheptane	29	21	15	0%	0%	0%
109	2,2,5-trimethylhexane	38	11	12	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0%	0%	0%
111	octenes	0	0	0	0%	0%	0%
112	n-octane	12	0	0	0%	0%	0%
113	trans-2-octene	0	0	0	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
115	cis-2-octene	0	0	0	0%	0%	0%
116	2,3,5-trimethylhexane	0	0	0	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0%	0%	0%
118	2,6-dimethylheptane	0	9	0	0%	0%	0%
119	3,5-dimethylheptane	0	0	0	0%	0%	0%
120	ethylbenzene	155	65	75	1%	1%	1%
121	2,3-dimethylheptane	0	0	0	0%	0%	0%
122	m- & p-xylene	335	125	162	3%	1%	2%

Vapor Compostion
Mass Concentration
PH2-Vehicle

	A	B	C	D	E	F	G
123	4-methyloctane	21	9	0	0%	0%	0%
124	3-methyloctane	0	0	0	0%	0%	0%
125	styrene (ethenylbenzene)	9	0	0	0%	0%	0%
126	o-xylene	103	42	47	1%	0%	0%
127	2,2,4-trimethylheptane	11	0	0	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0%	0%	0%
129	n-nonane	12	0	0	0%	0%	0%
130	(1-methylethyl)benzene	0	0	0	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0%	0%	0%
135	n-propylbenzene	16	0	0	0%	0%	0%
136	1-methyl-3-ethylbenzene	43	12	17	0%	0%	0%
137	1-methyl-4-ethylbenzene	22	8	10	0%	0%	0%
138	1,3,5-trimethylbenzene	19	0	0	0%	0%	0%
139	1-methyl-2-ethylbenzene	24	0	0	0%	0%	0%
140	1,2,4-trimethylbenzene	42	14	18	0%	0%	0%
141	n-decane	0	0	0	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0%	0%	0%
145	1,2,3-trimethylbenzene	12	0	0	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0%	0%	0%
147	2,3-dihydroindene (indan)	0	0	0	0%	0%	0%
148	1,3-diethylbenzene	0	0	0	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0%	0%	0%
150	1,4-diethylbenzene	0	0	0	0%	0%	0%
151	1-methyl-3-n-propylbenzene	0	0	0	0%	0%	0%
152	(1,1-dimethylethyl)benzene	0	0	0	0%	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
158	n-undecane (hendecane)	0	0	0	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	0	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	0	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
162	C11 aromatic	0	0	0	0%	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	0	0%	0%	0%
164	n-pentylbenzene	0	0	0	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0	0%	0%	0%
166	naphthalene	0	0	0	0%	0%	0%
167	n-dodecane	0	0	0	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0%	0%	0%
171	1-hexene	0	0	0	0%	0%	0%
172	cis-3-hexene	0	0	0	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0%	0%	0%
174	trans-3-heptene	0	0	0	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0%	0%	0%
178	4-methylheptane	0	0	0	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0%	0%	0%
182	1-octene	0	0	0	0%	0%	0%
183	trans-4-octene	0	0	0	0%	0%	0%

Vapor Compostion
Mass Concentration
PH2-Vehicle

	A	B	C	D	E	F	G
184	cis-1,2-dimethylcyclohexane	0	0	0	0%	0%	0%
185	ethylcyclohexane	0	0	0	0%	0%	0%
186	1-nonene	0	0	0	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene***	0	0	0	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0%	0%	0%
194	Mid-Range	6028	4021	4394	46%	40%	41%
195							
196	NMHC	13142	10002	10751	100%	100%	100%
197							
198	ALCOHOLS						
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.			
200		ug/ml	ug/ml	ug/ml	Weight %	Weight %	Weight %
201	Methanol	0	0	0	0%	0%	0%
202	Ethanol	0	0	0	0%	0%	0%
203	Alcohols	0	0	0	0%	0%	0%
204							
205							
206	CARBONYLS						
207	COMPOUND						
208							
209	Formaldehyde	0	0	0	0%	0%	0%
210	Acetaldehyde	0	0	0	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0%	0%	0%
216	Methacrolein	0	0	0	0%	0%	0%
217	Benzaldehyde	0	0	0	0%	0%	0%
218	Crotonaldehdye	0	0	0	0%	0%	0%
219	Valeraldehyde	0	0	0	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0%	0%	0%
221	Hexanal	0	0	0	0%	0%	0%
222	Carbonyls	0	0	0	0%	0%	0%
223							
224	Total NMOG	13142	10002	10751	100%	100%	100%
225							
226	NOTES						
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)						
228	PPB = PPBC / Carbon Number						
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)						
230	Tests with inconsistent results are excluded.						

Vapor Composition
Mass Concentration
RFA-Drum

	A	B	C	D	E	F	G	H	I
1		RFA-80-	RFA-40-	RFA-10-	RFA-10-	RFA-80-	RFA-40-	RFA-10-	RFA-10-
2		DR	DR	DR	DR*	DR	DR	DR	DR*
3	LIGHT END HYDROCARBONS	VR37	VR45	VR49	VR47	VR37	VR45	VR49	VR47
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc	Mass Conc.				
5		ug/ml	ug/ml	ug/ml	ug/ml	Weight	Weight %	Weight %	Weight %
6	ethane	2	3	0	2	0%	0%	0%	0%
7	ethene	10	0	0	15	0%	0%	0%	0%
8	propane	12	5	4	8	0%	0%	0%	0%
9	propene	0	0	0	0	0%	0%	0%	0%
10	methylpropane	95	119	135	108	1%	1%	1%	1%
11	ethyne	0	0	0	0	0%	0%	0%	0%
12	n-butane	3181	4062	4785	3750	40%	36%	29%	32%
13	propadiene	0	0	0	0	0%	0%	0%	0%
14	trans-2-butene	16	20	23	19	0%	0%	0%	0%
15	1-butene	0	0	0	0	0%	0%	0%	0%
16	2-methylpropene	0	0	0	0	0%	0%	0%	0%
17	cis-2-butene	20	25	30	23	0%	0%	0%	0%
18	2,2-dimethylpropane	24	31	37	29	0%	0%	0%	0%
19	methylbutane	2654	3473	4281	3361	33%	31%	26%	29%
20	1-propyne	0	0	0	0	0%	0%	0%	0%
21	n-pentane	578	755	942	740	7%	7%	6%	6%
22	1,3-butadiene	0	0	0	0	0%	0%	0%	0%
23	3-methyl-1-butene	17	22	26	20	0%	0%	0%	0%
24	cyclopentene	18	25	29	24	0%	0%	0%	0%
25	trans-2-pentene	131	169	208	165	2%	1%	1%	1%
26	2-methyl-2-butene	173	222	268	212	2%	2%	2%	2%
27	1-pentene	55	71	87	70	1%	1%	1%	1%
28	2-methyl-1-butene	99	127	157	125	1%	1%	1%	1%
29	cis-2-pentene	72	92	114	91	1%	1%	1%	1%
30	1-buten-3-yne	0	0	0	0	0%	0%	0%	0%
31	2-butyne	0	0	0	0	0%	0%	0%	0%
32	1-butyne	9	11	14	12	0%	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0	0%	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0	0%	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0	0%	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0	0%	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0	0%	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0	0%	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0	0%	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0	0%	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0	0%	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0	0%	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0	0%	0%	0%	0%
44	Light End	7168	9233	11143	8772	89%	81%	69%	75%
45									
46									
47	ALCOHOLS								
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc	Mass Conc.				
49		ug/ml	ug/ml	ug/ml	ug/ml	Weight	Weight %	Weight %	Weight %
50	2-methyl-1,3-butadiene	0	0	0	0	0%	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0	0%	0%	0%	0%
52	1,3-pentadiene	0	0	0	0	0%	0%	0%	0%
53	cyclopentadiene	0	0	0	0	0%	0%	0%	0%
54	2,2-dimethylbutane	64	101	124	89	1%	1%	1%	1%
55	3-methyl-1-pentene	0	13	20	13	0%	0%	0%	0%
56	cyclopentane	23	35	40	29	0%	0%	0%	0%
57	2,3-dimethylbutane	110	175	214	158	1%	2%	1%	1%
58	1-methyl-tert-butyl-ether	0	0	0	0	0%	0%	0%	0%
59	2-methylpentane	208	508	639	465	3%	4%	4%	4%
60	4-methyl-cis-2-pentene	0	19	23	21	0%	0%	0%	0%
61	3-methylpentane	125	277	341	251	2%	2%	2%	2%

Vapor Composition
Mass Concentration
RFA-Drum

	A	B	C	D	E	F	G	H	I
62	2-methyl-1-pentene	0	16	29	26	0%	0%	0%	0%
63	n-hexane	0	95	182	124	0%	1%	1%	1%
64	trans-3-hexene	0	13	0	9	0%	0%	0%	0%
65	trans-2-hexene	0	0	0	0	0%	0%	0%	0%
66	2-methyl-2-pentene	0	16	23	15	0%	0%	0%	0%
67	3-methylcyclopentene	0	17	17	13	0%	0%	0%	0%
68	cis-2-hexene	0	0	0	0	0%	0%	0%	0%
69	3-methyl-cis-2-pentene	0	0	0	0	0%	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0	0%	0%	0%	0%
71	methylcyclopentane	48	96	131	97	1%	1%	1%	1%
72	2,4-dimethylpentane	0	58	77	60	0%	1%	0%	1%
73	2,2,3-trimethylbutane	0	0	0	0	0%	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0	0%	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0	0%	0%	0%	0%
76	benzene	35	57	132	97	0%	1%	1%	1%
77	3-methyl-1-hexene	0	0	0	0	0%	0%	0%	0%
78	3,3-dimethylpentane	0	15	20	15	0%	0%	0%	0%
79	cyclohexane	0	0	0	0	0%	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0	0%	0%	0%	0%
81	2-methylhexane	0	0	0	0	0%	0%	0%	0%
82	2,3-dimethylpentane	15	83	168	116	0%	1%	1%	1%
83	cyclohexene	0	0	0	0	0%	0%	0%	0%
84	3-methylhexane	0	20	64	45	0%	0%	0%	0%
85	1-heptene	0	0	0	0	0%	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	0	13	17	14	0%	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	0	10	13	10	0%	0%	0%	0%
88	3-ethylpentane	0	10	0	10	0%	0%	0%	0%
89	2,2,4-trimethylpentane	0	64	103	80	0%	1%	1%	1%
90	3-methyl-trans-3-hexene	0	0	0	0	0%	0%	0%	0%
91	n-heptane	0	0	14	0	0%	0%	0%	0%
92	2-methyl-trans-2-hexene	0	0	0	0	0%	0%	0%	0%
93	trans-2-heptene	0	0	0	0	0%	0%	0%	0%
94	2-methyl-cis-2-hexene	0	0	0	0	0%	0%	0%	0%
95	cis-2-heptene	0	0	0	0	0%	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0	0%	0%	0%	0%
97	methylcyclohexane	0	17	25	19	0%	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0	0%	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0	0%	0%	0%	0%
100	2,5-dimethylhexane	0	0	0	0	0%	0%	0%	0%
101	2,4-dimethylhexane	0	0	0	0	0%	0%	0%	0%
102	3,3-dimethylhexane	0	0	0	0	0%	0%	0%	0%
103	2,3,4-trimethylpentane	0	0	21	14	0%	0%	0%	0%
104	toluene	127	177	305	228	2%	2%	2%	2%
105	2,3,3-trimethylpentane	0	0	0	0	0%	0%	0%	0%
106	2,3-dimethylhexane	14	0	0	0	0%	0%	0%	0%
107	2-methylheptane	15	0	21	0	0%	0%	0%	0%
108	3-methylheptane	0	12	23	12	0%	0%	0%	0%
109	2,2,5-trimethylhexane	0	0	0	0	0%	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0	0%	0%	0%	0%
111	octenes	0	0	0	0	0%	0%	0%	0%
112	n-octane	0	0	11	0	0%	0%	0%	0%
113	trans-2-octene	0	0	0	0	0%	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0	0%	0%	0%	0%
115	cis-2-octene	0	0	0	0	0%	0%	0%	0%
116	2,3,5-trimethylhexane	0	0	0	0	0%	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0	0%	0%	0%	0%
118	2,6-dimethylheptane	0	17	0	0	0%	0%	0%	0%
119	3,5-dimethylheptane	0	0	0	0	0%	0%	0%	0%
120	ethylbenzene	18	34	143	77	0%	0%	1%	1%
121	2,3-dimethylheptane	0	0	0	0	0%	0%	0%	0%
122	m- & p-xylene	40	61	415	195	0%	1%	3%	2%

Vapor Composition
Mass Concentration
RFA-Drum

	A	B	C	D	E	F	G	H	I
123	4-methyloctane	0	0	17	0	0%	0%	0%	0%
124	3-methyloctane	0	0	0	0	0%	0%	0%	0%
125	styrene (ethenylbenzene)	0	0	12	0	0%	0%	0%	0%
126	o-xylene	10	20	164	82	0%	0%	1%	1%
127	2,2,4-trimethylheptane	0	0	0	0	0%	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0	0%	0%	0%	0%
129	n-nonane	0	0	14	0	0%	0%	0%	0%
130	(1-methylethyl)benzene	0	0	9	0	0%	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0	0%	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0	0%	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0	0%	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0	0%	0%	0%	0%
135	n-propylbenzene	0	0	60	23	0%	0%	0%	0%
136	1-methyl-3-ethylbenzene	10	16	214	0	0%	0%	1%	0%
137	1-methyl-4-ethylbenzene	0	0	98	38	0%	0%	1%	0%
138	1,3,5-trimethylbenzene	0	0	112	45	0%	0%	1%	0%
139	1-methyl-2-ethylbenzene	0	0	83	36	0%	0%	1%	0%
140	1,2,4-trimethylbenzene	13	22	331	137	0%	0%	2%	1%
141	n-decane	0	0	12	0	0%	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0	0%	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0	0%	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0	0%	0%	0%	0%
145	1,2,3-trimethylbenzene	0	13	66	34	0%	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0	0%	0%	0%	0%
147	2,3-dihydroindene (indan)	0	0	40	16	0%	0%	0%	0%
148	1,3-diethylbenzene	0	0	27	13	0%	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0	0%	0%	0%	0%
150	1,4-diethylbenzene	0	0	44	22	0%	0%	0%	0%
151	1-methyl-3-n-propylbenzene	0	0	54	27	0%	0%	0%	0%
152	(1,1-dimethylethyl)benzene	0	0	57	30	0%	0%	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	17	9	0%	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	27	13	0%	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	40	21	0%	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	0	0	70	37	0%	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0	0%	0%	0%	0%
158	n-undecane (hendecane)	0	0	0	0	0%	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	17	9	0%	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	28	16	0%	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	33	18	0%	0%	0%	0%
162	C11 aromatic	0	0	51	15	0%	0%	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	35	19	0%	0%	0%	0%
164	n-pentylbenzene	0	0	0	0	0%	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0	0	0%	0%	0%	0%
166	naphthalene	0	0	13	0	0%	0%	0%	0%
167	n-dodecane	0	0	0	0	0%	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0	0%	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0	0%	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0	0%	0%	0%	0%
171	1-hexene	0	0	0	0	0%	0%	0%	0%
172	cis-3-hexene	0	0	0	0	0%	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0	0%	0%	0%	0%
174	trans-3-heptene	0	0	0	0	0%	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0	0%	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0	0%	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0	0%	0%	0%	0%
178	4-methylheptane	0	0	0	0	0%	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0	0%	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0	0%	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0	0%	0%	0%	0%
182	1-octene	0	0	0	0	0%	0%	0%	0%
183	trans-4-octene	0	0	0	0	0%	0%	0%	0%

Vapor Composition
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	A	B	C	D	E	F	G	H	I
184	cis-1,2-dimethylcyclohexane	0	0	0	0	0%	0%	0%	0%
185	ethylcyclohexane	0	0	0	0	0%	0%	0%	0%
186	1-nonene	0	0	0	0	0%	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0	0%	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0	0%	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0	0%	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0	0%	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene	0	0	0	0	0%	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0	0%	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0	0%	0%	0%	0%
194	Mid-Range	873	2098	5100	2960	11%	19%	31%	25%
195									
196	NMHC	8041	11331	16243	11732	100%	100%	100%	100%
197									
198	ALCOHOLS								
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc	Mass Conc.				
200		ug/ml	ug/ml	ug/ml	ug/ml	Weight	Weight %	Weight %	Weight %
201	Methanol	0	0	0	0	0%	0%	0%	0%
202	Ethanol	0	0	0	0	0%	0%	0%	0%
203	Alcohols	0	0	0	0	0%	0%	0%	0%
204									
205									
206	CARBONYLS								
207	COMPOUND								
208									
209	Formaldehyde	0	0	0	0	0%	0%	0%	0%
210	Acetaldehyde	0	0	0	0	0%	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0	0%	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0	0%	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0	0%	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0	0%	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0	0%	0%	0%	0%
216	Methacrolein	0	0	0	0	0%	0%	0%	0%
217	Benzaldehyde	0	0	0	0	0%	0%	0%	0%
218	Crotonaldehdye	0	0	0	0	0%	0%	0%	0%
219	Valeraldehyde	0	0	0	0	0%	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0	0%	0%	0%	0%
221	Hexanal	0	0	0	0	0%	0%	0%	0%
222	Carbonyls	0	0	0	0	0%	0%	0%	0%
223									
224	Total NMOG	8041	11331	16243	11732	100%	100%	100%	100%
225									
226	NOTES								
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)								
228	PPB = PPBC / Carbon Number								
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)								
230	Tests with inconsistent results are excluded.								
231									
232	* - No pressure								

Vapor Composition
Mass Concentration
RFA-Vehicle

	A	B	C	D	E	F	G
1		RFA-80-VW	RFA-40-VW	RFA-10-VW	RFA-80-VW	RFA-40-VW	RFA-10-VW
2		VR51	VR53	VR55	VR51	VR53	VR55
3	LIGHT END HYDROCARBONS						
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
5		ug/ml	ug/ml	ug/ml			
6	ethane	0	0	0	0%	0%	0%
7	ethene	0	0	0	0%	0%	0%
8	propane	4	1	13	0%	0%	0%
9	propene	0	0	0	0%	0%	0%
10	methylpropane	135	97	72	1%	1%	1%
11	ethyne	0	0	0	0%	0%	0%
12	n-butane	4785	3334	2564	29%	31%	27%
13	propadiene	0	0	0	0%	0%	0%
14	trans-2-butene	23	18	14	0%	0%	0%
15	1-butene	0	0	0	0%	0%	0%
16	2-methylpropene	0	0	0	0%	0%	0%
17	cis-2-butene	30	22	18	0%	0%	0%
18	2,2-dimethylpropane	37	27	22	0%	0%	0%
19	methylbutane	4281	3107	2513	26%	29%	26%
20	1-propyne	0	0	0	0%	0%	0%
21	n-pentane	942	684	587	6%	6%	6%
22	1,3-butadiene	0	0	0	0%	0%	0%
23	3-methyl-1-butene	26	44	38	0%	0%	0%
24	cyclopentene	29	0	0	0%	0%	0%
25	trans-2-pentene	208	163	139	1%	2%	1%
26	2-methyl-2-butene	268	215	184	2%	2%	2%
27	1-pentene	87	67	58	1%	1%	1%
28	2-methyl-1-butene	157	121	100	1%	1%	1%
29	cis-2-pentene	114	89	75	1%	1%	1%
30	1-buten-3-yne	0	0	0	0%	0%	0%
31	2-butyne	0	0	0	0%	0%	0%
32	1-butyne	14	10	9	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0%	0%	0%
44	Light End	11143	7999	6405	69%	74%	67%
45							
46							
47	MID-RANGE HYDROCARBONS						
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
49		ug/ml	ug/ml	ug/ml			
50	2-methyl-1,3-butadiene	0	0	0	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0%	0%	0%
52	1,3-pentadiene	0	0	0	0%	0%	0%
53	cyclopentadiene	0	0	0	0%	0%	0%
54	2,2-dimethylbutane	124	106	106	1%	1%	1%
55	3-methyl-1-pentene	20	24	24	0%	0%	0%
56	cyclopentane	40	32	33	0%	0%	0%
57	2,3-dimethylbutane	214	183	183	1%	2%	2%
58	1-methyl-tert-butyl-ether	0	0	0	0%	0%	0%
59	2-methylpentane	639	570	561	4%	5%	6%
60	4-methyl-cis-2-pentene	23	13	26	0%	0%	0%
61	3-methylpentane	341	291	304	2%	3%	3%

Vapor Composition
Mass Concentration
RFA-Vehicle

	A	B	C	D	E	F	G
62	2-methyl-1-pentene	29	44	45	0%	0%	0%
63	n-hexane	182	205	208	1%	2%	2%
64	trans-3-hexene	0	24	24	0%	0%	0%
65	trans-2-hexene	0	45	45	0%	0%	0%
66	2-methyl-2-pentene	23	37	38	0%	0%	0%
67	3-methylcyclopentene	17	25	24	0%	0%	0%
68	cis-2-hexene	0	19	20	0%	0%	0%
69	3-methyl-cis-2-pentene	0	30	32	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0%	0%	0%
71	methylcyclopentane	131	87	91	1%	1%	1%
72	2,4-dimethylpentane	77	69	72	0%	1%	1%
73	2,2,3-trimethylbutane	0	0	0	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0%	0%	0%
76	benzene	132	146	157	1%	1%	2%
77	3-methyl-1-hexene	0	0	0	0%	0%	0%
78	3,3-dimethylpentane	20	0	0	0%	0%	0%
79	cyclohexane	0	0	0	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0%	0%	0%
81	2-methylhexane	0	0	0	0%	0%	0%
82	2,3-dimethylpentane	168	149	159	1%	1%	2%
83	cyclohexene	0	0	0	0%	0%	0%
84	3-methylhexane	64	55	65	0%	1%	1%
85	1-heptene	0	0	0	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	17	16	17	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	13	11	12	0%	0%	0%
88	3-ethylpentane	0	15	16	0%	0%	0%
89	2,2,4-trimethylpentane	103	99	96	1%	1%	1%
90	3-methyl-trans-3-hexene	0	13	10	0%	0%	0%
91	n-heptane	14	43	49	0%	0%	1%
92	2-methyl-trans-2-hexene	0	0	0	0%	0%	0%
93	trans-2-heptene	0	0	0	0%	0%	0%
94	2-methyl-cis-2-hexene	0	9	0	0%	0%	0%
95	cis-2-heptene	0	0	0	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0%	0%	0%
97	methylcyclohexane	25	20	23	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0%	0%	0%
100	2,5-dimethylhexane	0	11	12	0%	0%	0%
101	2,4-dimethylhexane	0	11	13	0%	0%	0%
102	3,3-dimethylhexane	0	0	0	0%	0%	0%
103	2,3,4-trimethylpentane	21	20	23	0%	0%	0%
104	toluene	305	186	242	2%	2%	3%
105	2,3,3-trimethylpentane	0	0	0	0%	0%	0%
106	2,3-dimethylhexane	0	0	9	0%	0%	0%
107	2-methylheptane	21	15	19	0%	0%	0%
108	3-methylheptane	23	14	18	0%	0%	0%
109	2,2,5-trimethylhexane	0	9	0	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0%	0%	0%
111	octenes	0	0	0	0%	0%	0%
112	n-octane	11	0	12	0%	0%	0%
113	trans-2-octene	0	0	0	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
115	cis-2-octene	0	0	0	0%	0%	0%
116	2,3,5-trimethylhexane	0	0	0	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0%	0%	0%
118	2,6-dimethylheptane	0	10	9	0%	0%	0%
119	3,5-dimethylheptane	0	0	0	0%	0%	0%
120	ethylbenzene	143	24	46	1%	0%	0%
121	2,3-dimethylheptane	0	0	0	0%	0%	0%
122	m- & p-xylene	415	52	97	3%	0%	1%

Vapor Composition
Mass Concentration
RFA-Vehicle

	A	B	C	D	E	F	G
123	4-methyloctane	17	0	0	0%	0%	0%
124	3-methyloctane	0	0	0	0%	0%	0%
125	styrene (ethenylbenzene)	12	0	0	0%	0%	0%
126	o-xylene	164	17	48	1%	0%	1%
127	2,2,4-trimethylheptane	0	0	0	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0%	0%	0%
129	n-nonane	14	0	0	0%	0%	0%
130	(1-methylethyl)benzene	9	0	0	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0%	0%	0%
135	n-propylbenzene	60	0	8	0%	0%	0%
136	1-methyl-3-ethylbenzene	214	16	25	1%	0%	0%
137	1-methyl-4-ethylbenzene	98	0	11	1%	0%	0%
138	1,3,5-trimethylbenzene	112	0	13	1%	0%	0%
139	1-methyl-2-ethylbenzene	83	18	24	1%	0%	0%
140	1,2,4-trimethylbenzene	331	8	29	2%	0%	0%
141	n-decane	12	0	0	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0%	0%	0%
145	1,2,3-trimethylbenzene	66	0	0	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0%	0%	0%
147	2,3-dihydroindene (indan)	40	0	0	0%	0%	0%
148	1,3-diethylbenzene	27	0	0	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0%	0%	0%
150	1,4-diethylbenzene	44	0	0	0%	0%	0%
151	1-methyl-3-n-propylbenzene	54	0	0	0%	0%	0%
152	(1,1-dimethylethyl)benzene	57	0	0	0%	0%	0%
153	1-methyl-2-n-propylbenzene	17	0	0	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	27	0	0	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	40	0	0	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	70	0	0	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
158	n-undecane (hendecane)	0	0	0	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	17	0	0	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	28	0	0	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	33	0	0	0%	0%	0%
162	C11 aromatic	51	0	0	0%	0%	0%
163	1-methyl-2-n-butylbenzene	35	0	0	0%	0%	0%
164	n-pentylbenzene	0	0	0	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0	0%	0%	0%
166	naphthalene	13	0	0	0%	0%	0%
167	n-dodecane	0	4	0	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0%	0%	0%
171	1-hexene	0	0	0	0%	0%	0%
172	cis-3-hexene	0	0	0	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0%	0%	0%
174	trans-3-heptene	0	0	0	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0%	0%	0%
178	4-methylheptane	0	0	0	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0%	0%	0%
182	1-octene	0	0	0	0%	0%	0%
183	trans-4-octene	0	0	0	0%	0%	0%

Vapor Composition
Mass Concentration
RFA-Vehicle

	A	B	C	D	E	F	G
184	cis-1,2-dimethylcyclohexane	0	0	0	0%	0%	0%
185	ethylcyclohexane	0	0	0	0%	0%	0%
186	1-nonene	0	0	0	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene*	0	0	0	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0%	0%	0%
194	Mid-Range	5100	2796	3101	31%	26%	33%
195							
196	NMHC	16243	10795	9506	100%	100%	100%
197							
198	ALCOHOLS						
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
200		ug/ml	ug/ml	ug/ml			
201	Methanol	0	0	0	0%	0%	0%
202	Ethanol	0	0	0	0%	0%	0%
203	Alcohols	0	0	0	0%	0%	0%
204							
205							
206	CARBONYLS						
207	COMPOUND						
208							
209	Formaldehyde	0	0	0	0%	0%	0%
210	Acetaldehyde	0	0	0	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0%	0%	0%
216	Methacrolein	0	0	0	0%	0%	0%
217	Benzaldehyde	0	0	0	0%	0%	0%
218	Crotonaldehdye	0	0	0	0%	0%	0%
219	Valeraldehyde	0	0	0	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0%	0%	0%
221	Hexanal	0	0	0	0%	0%	0%
222	Carbonyl	0	0	0	0%	0%	0%
223							
224	Total NMOG	16243	10795	9506	100%	100%	100%
225							
226	NOTES						
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)						
228	PPB = PPBC / Carbon Number						
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)						
230	Tests with inconsistent results are excluded.						

Vapor Composition
Mass Concentration
M85-Drum

	A	B	C	D	E	F	G
1		M85-40-	M85-10-	M85-10-	M85-40-	M85-10-	M85-10-
2		DR	DR	DR*	DR	DR	DR*
3	LIGHT END HYDROCARBONS	VR59	VR61	VR82	VR59	VR61	VR82
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
5		ug/ml	ug/ml	ug/ml			
6	ethane	0	0	0	0%	0%	0%
7	ethene	0	1	0	0%	0%	0%
8	propane	2	4	2	0%	0%	0%
9	propene	0	0	0	0%	0%	0%
10	methylpropane	69	53	83	1%	1%	1%
11	ethyne	0	1	0	0%	0%	0%
12	n-butane	2232	1761	2915	28%	24%	29%
13	propadiene	0	0	0	0%	0%	0%
14	trans-2-butene	0	0	0	0%	0%	0%
15	1-butene	0	0	0	0%	0%	0%
16	2-methylpropene	0	0	9	0%	0%	0%
17	cis-2-butene	0	0	0	0%	0%	0%
18	2,2-dimethylpropane	27	22	37	0%	0%	0%
19	methylbutane	1360	1143	2028	17%	15%	20%
20	1-propyne	0	0	0	0%	0%	0%
21	n-pentane	215	186	341	3%	3%	3%
22	1,3-butadiene	0	0	0	0%	0%	0%
23	3-methyl-1-butene	9	0	15	0%	0%	0%
24	cyclopentene	0	0	0	0%	0%	0%
25	trans-2-pentene	33	28	56	0%	0%	0%
26	2-methyl-2-butene	47	39	76	1%	1%	1%
27	1-pentene	12	11	21	0%	0%	0%
28	2-methyl-1-butene	23	20	38	0%	0%	0%
29	cis-2-pentene	18	16	32	0%	0%	0%
30	1-buten-3-yne	0	0	0	0%	0%	0%
31	2-butyne	0	0	0	0%	0%	0%
32	1-butyne	0	0	0	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0%	0%	0%
44	Light End	4049	3283	5653	51%	44%	56%
45							
46							
47	MID-RANGE HYDROCARBONS						
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
49		ug/ml	ug/ml	ug/ml			
50	2-methyl-1,3-butadiene	0	0	0	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0%	0%	0%
52	1,3-pentadiene	0	0	0	0%	0%	0%
53	cyclopentadiene	0	0	0	0%	0%	0%
54	2,2-dimethylbutane	60	47	79	1%	1%	1%
55	3-methyl-1-pentene	0	0	0	0%	0%	0%
56	cyclopentane	0	0	0	0%	0%	0%
57	2,3-dimethylbutane	93	76	121	1%	1%	1%
58	1-methyl-tert-butyl-ether	136	126	133	2%	2%	1%
59	2-methylpentane	181	151	252	2%	2%	3%
60	4-methyl-cis-2-pentene	0	10	0	0%	0%	0%
61	3-methylpentane	77	73	123	1%	1%	1%

Vapor Composition
Mass Concentration
M85-Drum

	A	B	C	D	E	F	G
62	2-methyl-1-pentene	13	10	0	0%	0%	0%
63	n-hexane	39	42	63	1%	1%	1%
64	trans-3-hexene	0	0	0	0%	0%	0%
65	trans-2-hexene	12	9	0	0%	0%	0%
66	2-methyl-2-pentene	9	0	0	0%	0%	0%
67	3-methylcyclopentene	0	0	0	0%	0%	0%
68	cis-2-hexene	0	0	0	0%	0%	0%
69	3-methyl-cis-2-pentene	0	0	0	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0%	0%	0%
71	methylcyclopentane	25	22	33	0%	0%	0%
72	2,4-dimethylpentane	101	80	128	1%	1%	1%
73	2,2,3-trimethylbutane	0	0	0	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0%	0%	0%
76	benzene	17	19	37	0%	0%	0%
77	3-methyl-1-hexene	0	0	0	0%	0%	0%
78	3,3-dimethylpentane	0	0	0	0%	0%	0%
79	cyclohexane	0	0	0	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0%	0%	0%
81	2-methylhexane	0	0	0	0%	0%	0%
82	2,3-dimethylpentane	137	124	178	2%	2%	2%
83	cyclohexene	0	0	0	0%	0%	0%
84	3-methylhexane	27	35	57	0%	0%	1%
85	1-heptene	0	0	0	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	0	0	0	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	0	0	0	0%	0%	0%
88	3-ethylpentane	0	0	0	0%	0%	0%
89	2,2,4-trimethylpentane	192	176	240	2%	2%	2%
90	3-methyl-trans-3-hexene	0	0	0	0%	0%	0%
91	n-heptane	32	33	34	0%	0%	0%
92	2-methyl-trans-2-hexene	0	0	0	0%	0%	0%
93	trans-2-heptene	0	0	0	0%	0%	0%
94	2-methyl-cis-2-hexene	0	0	0	0%	0%	0%
95	cis-2-heptene	0	0	0	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0%	0%	0%
97	methylcyclohexane	0	0	0	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0%	0%	0%
100	2,5-dimethylhexane	18	18	0	0%	0%	0%
101	2,4-dimethylhexane	18	18	0	0%	0%	0%
102	3,3-dimethylhexane	0	0	0	0%	0%	0%
103	2,3,4-trimethylpentane	34	34	33	0%	0%	0%
104	toluene	53	79	56	1%	1%	1%
105	2,3,3-trimethylpentane	0	0	0	0%	0%	0%
106	2,3-dimethylhexane	11	15	0	0%	0%	0%
107	2-methylheptane	14	17	0	0%	0%	0%
108	3-methylheptane	14	14	0	0%	0%	0%
109	2,2,5-trimethylhexane	11	11	0	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0%	0%	0%
111	octenes	0	0	0	0%	0%	0%
112	n-octane	0	9	0	0%	0%	0%
113	trans-2-octene	0	0	0	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
115	cis-2-octene	0	0	0	0%	0%	0%
116	2,3,5-trimethylhexane	0	0	0	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0%	0%	0%
118	2,6-dimethylheptane	0	0	0	0%	0%	0%
119	3,5-dimethylheptane	0	0	0	0%	0%	0%
120	ethylbenzene	16	32	0	0%	0%	0%
121	2,3-dimethylheptane	0	0	0	0%	0%	0%
122	m- & p-xylene	12	52	21	0%	1%	0%

Vapor Composition
Mass Concentration
M85-Drum

	A	B	C	D	E	F	G
123	4-methyloctane	0	0	0	0%	0%	0%
124	3-methyloctane	0	0	0	0%	0%	0%
125	styrene (ethenylbenzene)	0	0	0	0%	0%	0%
126	o-xylene	0	20	0	0%	0%	0%
127	2,2,4-trimethylheptane	0	0	0	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0%	0%	0%
129	n-nonane	0	0	0	0%	0%	0%
130	(1-methylethyl)benzene	0	0	0	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0%	0%	0%
135	n-propylbenzene	0	0	0	0%	0%	0%
136	1-methyl-3-ethylbenzene	0	19	0	0%	0%	0%
137	1-methyl-4-ethylbenzene	0	9	0	0%	0%	0%
138	1,3,5-trimethylbenzene	0	10	48	0%	0%	0%
139	1-methyl-2-ethylbenzene	11	0	0	0%	0%	0%
140	1,2,4-trimethylbenzene	0	23	0	0%	0%	0%
141	n-decane	0	0	21	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0%	0%	0%
145	1,2,3-trimethylbenzene	0	8	0	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0%	0%	0%
147	2,3-dihydroindene (indan)	0	0	0	0%	0%	0%
148	1,3-diethylbenzene	0	0	0	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0%	0%	0%
150	1,4-diethylbenzene	0	0	0	0%	0%	0%
151	1-methyl-3-n-propylbenzene	0	0	0	0%	0%	0%
152	(1,1-dimethylethyl)benzene	0	0	0	0%	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
158	n-undecane (hendecane)	0	0	0	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	0	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	0	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
162	C11 aromatic	11	0	0	0%	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	0	0%	0%	0%
164	n-pentylbenzene	0	0	0	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0	0%	0%	0%
166	naphthalene	0	0	0	0%	0%	0%
167	n-dodecane	0	0	0	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0%	0%	0%
171	1-hexene	0	0	0	0%	0%	0%
172	cis-3-hexene	0	0	0	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0%	0%	0%
174	trans-3-heptene	0	0	0	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0%	0%	0%
178	4-methylheptane	0	0	0	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0%	0%	0%
182	1-octene	0	0	0	0%	0%	0%
183	trans-4-octene	0	0	0	0%	0%	0%

Vapor Composition
Mass Concentration
M85-Drum

	A	B	C	D	E	F	G
184	cis-1,2-dimethylcyclohexane	0	0	0	0%	0%	0%
185	ethylcyclohexane	0	0	0	0%	0%	0%
186	1-nonene	0	0	0	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene**	0	0	0	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0%	0%	0%
194	Mid-Range	1372	1423	1657	17%	19%	17%
195							
196	NMHC	5421	4707	7310	69%	64%	73%
197							
198	ALCOHOLS						
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
200		ug/ml	ug/ml	ug/ml			
201	Methanol	2453	2682	2725	31%	36%	27%
202	Ethanol	0	0	0	0%	0%	0%
203	Alcohols	2453	2682	2725	31%	36%	27%
204							
205							
206	CARBONYLS						
207	COMPOUND						
208							
209	Formaldehyde	0	0	0	0%	0%	0%
210	Acetaldehyde	0	0	0	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0%	0%	0%
216	Methacrolein	0	0	0	0%	0%	0%
217	Benzaldehyde	0	0	0	0%	0%	0%
218	Crotonaldehdye	0	0	0	0%	0%	0%
219	Valeraldehyde	0	0	0	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0%	0%	0%
221	Hexanal	0	0	0	0%	0%	0%
222	Carbonyls	0	0	0	0%	0%	0%
223							
224	Total NMOG	7874	7388	10035	100%	100%	100%
225							
226	NOTES						
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)						
228	PPB = PPBC / Carbon Number						
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)						
230	Tests with inconsistent results are excluded.						
231							
232	* - No Pressure						
233	Test VR57 has no alcohol data						

Vapor Composition
Mass Concentration
M85-Vehicle

	A	B	C	D	E
1		M85-80-VW	M85-10-VW	M85-80-VW	M85-10-VW
2		VR63	VR67	VR63	VR67
3	LIGHT END HYDROCARBONS				
4	COMPOUND	Mass Conc.	Mass Conc.	Weight %	Weight %
5		ug/ml	ug/ml		
6	ethane	0	0	0%	0%
7	ethene	0	0	0%	0%
8	propane	4	2	0%	0%
9	propene	0	0	0%	0%
10	methylpropane	74	65	1%	1%
11	ethyne	0	0	0%	0%
12	n-butane	2456	2413	30%	24%
13	propadiene	0	0	0%	0%
14	trans-2-butene	0	0	0%	0%
15	1-butene	0	0	0%	0%
16	2-methylpropene	0	0	0%	0%
17	cis-2-butene	0	0	0%	0%
18	2,2-dimethylpropane	30	30	0%	0%
19	methylbutane	1572	1767	19%	18%
20	1-propyne	0	0	0%	0%
21	n-pentane	265	305	3%	3%
22	1,3-butadiene	0	0	0%	0%
23	3-methyl-1-butene	11	13	0%	0%
24	cyclopentene	0	0	0%	0%
25	trans-2-pentene	41	48	0%	0%
26	2-methyl-2-butene	58	69	1%	1%
27	1-pentene	16	18	0%	0%
28	2-methyl-1-butene	28	31	0%	0%
29	cis-2-pentene	23	26	0%	0%
30	1-buten-3-yne	0	0	0%	0%
31	2-butyne	0	0	0%	0%
32	1-butyne	0	0	0%	0%
33	Light-end-unidentified-1	0	0	0%	0%
34	Light-end-unidentified-2	0	0	0%	0%
35	Light-end-unidentified-3	0	0	0%	0%
36	Light-end-unidentified-4	0	0	0%	0%
37	Light-end-unidentified-5	0	0	0%	0%
38	Light-end-unidentified-6	0	0	0%	0%
39	Light-end-unidentified-7	0	0	0%	0%
40	Light-end-unidentified-8	0	0	0%	0%
41	Light-end-unidentified-9	0	0	0%	0%
42	Light-end-unidentified-10	0	0	0%	0%
43	Light-end-unidentified-11	0	0	0%	0%
44	Light End	4576	4788	55%	48%
45					
46					
47	MID-RANGE HYDROCABONS				
48	COMPOUND	Mass Conc.	Mass Conc.		
49		ug/ml	ug/ml	Weight %	Weight %
50	2-methyl-1,3-butadiene	0	0	0%	0%
51	3,3-dimethyl-1-butene	0	0	0%	0%
52	1,3-pentadiene	0	0	0%	0%
53	cyclopentadiene	0	0	0%	0%
54	2,2-dimethylbutane	62	82	1%	1%
55	3-methyl-1-pentene	0	9	0%	0%
56	cyclopentane	0	9	0%	0%
57	2,3-dimethylbutane	100	122	1%	1%
58	1-methyl-tert-butyl-ether	139	202	2%	2%
59	2-methylpentane	208	279	3%	3%
60	4-methyl-cis-2-pentene	0	12	0%	0%
61	3-methylpentane	102	153	1%	2%

Vapor Composition
Mass Concentration
M85-Vehicle

	A	B	C	D	E
62	2-methyl-1-pentene	12	17	0%	0%
63	n-hexane	59	75	1%	1%
64	trans-3-hexene	0	10	0%	0%
65	trans-2-hexene	13	18	0%	0%
66	2-methyl-2-pentene	11	15	0%	0%
67	3-methylcyclopentene	9	9	0%	0%
68	cis-2-hexene	0	0	0%	0%
69	3-methyl-cis-2-pentene	9	13	0%	0%
70	2,2-dimethylpentane	0	0	0%	0%
71	methylcyclopentane	29	36	0%	0%
72	2,4-dimethylpentane	99	138	1%	1%
73	2,2,3-trimethylbutane	0	0	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0%	0%
75	1-methylcyclopentene	0	0	0%	0%
76	benzene	23	34	0%	0%
77	3-methyl-1-hexene	0	0	0%	0%
78	3,3-dimethylpentane	0	0	0%	0%
79	cyclohexane	0	0	0%	0%
80	4-methyl-trans-2-hexene	0	0	0%	0%
81	2-methylhexane	0	0	0%	0%
82	2,3-dimethylpentane	152	217	2%	2%
83	cyclohexene	0	0	0%	0%
84	3-methylhexane	42	71	1%	1%
85	1-heptene	0	0	0%	0%
86	trans-1,3-dimethylcyclopentane	0	0	0%	0%
87	cis-1,3-dimethylcyclopentane	0	0	0%	0%
88	3-ethylpentane	9	11	0%	0%
89	2,2,4-trimethylpentane	202	296	2%	3%
90	3-methyl-trans-3-hexene	0	0	0%	0%
91	n-heptane	38	51	0%	1%
92	2-methyl-trans-2-hexene	0	0	0%	0%
93	trans-2-heptene	0	0	0%	0%
94	2-methyl-cis-2-hexene	0	0	0%	0%
95	cis-2-heptene	0	0	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0%	0%
97	methylcyclohexane	0	10	0%	0%
98	2,2-dimethylhexane	0	0	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0%	0%
100	2,5-dimethylhexane	17	26	0%	0%
101	2,4-dimethylhexane	17	24	0%	0%
102	3,3-dimethylhexane	0	0	0%	0%
103	2,3,4-trimethylpentane	33	49	0%	0%
104	toluene	58	95	1%	1%
105	2,3,3-trimethylpentane	0	0	0%	0%
106	2,3-dimethylhexane	11	15	0%	0%
107	2-methylheptane	17	25	0%	0%
108	3-methylheptane	14	20	0%	0%
109	2,2,5-trimethylhexane	12	16	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0%	0%
111	octenes	0	0	0%	0%
112	n-octane	9	10	0%	0%
113	trans-2-octene	0	0	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0%	0%
115	cis-2-octene	0	0	0%	0%
116	2,3,5-trimethylhexane	0	0	0%	0%
117	2,4-dimethylheptane	0	0	0%	0%
118	2,6-dimethylheptane	0	0	0%	0%
119	3,5-dimethylheptane	0	0	0%	0%
120	ethylbenzene	15	20	0%	0%
121	2,3-dimethylheptane	0	0	0%	0%
122	m- & p-xylene	18	32	0%	0%

Vapor Composition
Mass Concentration
M85-Vehicle

	A	B	C	D	E
123	4-methyloctane	0	0	0%	0%
124	3-methyloctane	0	0	0%	0%
125	styrene (ethenylbenzene)	0	0	0%	0%
126	o-xylene	10	4	0%	0%
127	2,2,4-trimethylheptane	0	0	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0%	0%
129	n-nonane	0	0	0%	0%
130	(1-methylethyl)benzene	0	0	0%	0%
131	2,2-dimethyloctane	0	0	0%	0%
132	2,5-dimethyloctane	0	0	0%	0%
133	2,4-dimethyloctane	0	0	0%	0%
134	2,6-dimethyloctane	0	0	0%	0%
135	n-propylbenzene	0	0	0%	0%
136	1-methyl-3-ethylbenzene	0	9	0%	0%
137	1-methyl-4-ethylbenzene	0	0	0%	0%
138	1,3,5-trimethylbenzene	0	0	0%	0%
139	1-methyl-2-ethylbenzene	9	0	0%	0%
140	1,2,4-trimethylbenzene	0	12	0%	0%
141	n-decane	0	0	0%	0%
142	(2-methylpropyl)benzene	0	0	0%	0%
143	(1-methylpropyl)benzene	0	0	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0%	0%
145	1,2,3-trimethylbenzene	0	0	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0%	0%
147	2,3-dihydroindene (indan)	0	0	0%	0%
148	1,3-diethylbenzene	0	0	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0%	0%
150	1,4-diethylbenzene	0	0	0%	0%
151	1-methyl-3-n-propylbenzene	0	0	0%	0%
152	(1,1-dimethylethyl)benzene	0	0	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	0%	0%
156	1,2-dimethyl-4-ethylbenzene	0	0	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0%	0%
158	n-undecane (hendecane)	0	0	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	0%	0%
162	C11 aromatic	0	0	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	0%	0%
164	n-pentylbenzene	0	0	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0%	0%
166	naphthalene	0	0	0%	0%
167	n-dodecane	0	0	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0%	0%
169	4-methyl-t-2-pentene	0	0	0%	0%
170	4-methyl-1-pentene	0	0	0%	0%
171	1-hexene	0	0	0%	0%
172	cis-3-hexene	0	0	0%	0%
173	3-methyl-t-2-pentene	0	0	0%	0%
174	trans-3-heptene	0	0	0%	0%
175	3-ethyl-c-2-pentene	0	0	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0%	0%
178	4-methylheptane	0	0	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0%	0%
182	1-octene	0	0	0%	0%
183	trans-4-octene	0	0	0%	0%

Vapor Composition
Mass Concentration
M85-Vehicle

	A	B	C	D	E
184	cis-1,2-dimethylcyclohexane	0	0	0%	0%
185	ethylcyclohexane	0	0	0%	0%
186	1-nonene	0	0	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0%	0%
188	1,2-diethylbenzene	0	0	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene***	0	0	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0%	0%
194	Mid-Range	1558	2247	19%	22%
195					
196	NMHC	6134	7035	74%	70%
197					
198	ALCOHOLS				
199	COMPOUND	Mass Conc.	Mass Conc.		
200		ug/ml	ug/ml	Weight %	Weight %
201	Methanol	2127	2970	26%	30%
202	Ethanol	0	0	0%	0%
203	Alcohols	2127	2970	26%	30%
204					
205					
206	CARBONYLS				
207	COMPOUND				
208					
209	Formaldehyde	0	0	0%	0%
210	Acetaldehyde	0	0	0%	0%
211	Acrolein (Propenal)	0	0	0%	0%
212	Acetone (2-Propanone)	0	0	0%	0%
213	Propionaldehyde (Propanal)	0	0	0%	0%
214	Butyraldehyde (Butanal)	0	0	0%	0%
215	Methyl Ethyl Ketone	0	0	0%	0%
216	Methacrolein	0	0	0%	0%
217	Benzaldehyde	0	0	0%	0%
218	Crotonaldehdye	0	0	0%	0%
219	Valeraldehyde	0	0	0%	0%
220	m-Tolualdehyde	0	0	0%	0%
221	Hexanal	0	0	0%	0%
222	Carbonyls	0	0	0%	0%
223					
224	Total NMOG	8262	10005	100%	100%
225					
226	NOTES				
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)				
228	PPB = PPBC / Carbon Number				
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume				
230	(Molecular Volume = 24.055)				
231	Tests with inconsistent results are excluded.				
232					
233	Test VR65 has no alcohol data				

Vapor Composition
Mass Concentration
E85-Drum

	A	B	C	D	E	F	G
1		E85-80-	E85-40-	E85-10-	E85-80-	E85-40-	E85-10-
2		DR	DR	DR	DR	DR	DR
3	LIGHT END HYDROCARBONS	VR69	VR71	VR73	VR69	VR71	VR73
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
5		ug/ml	ug/ml	ug/ml			
6	ethane	0	1	0	0%	0%	0%
7	ethene	0	0	0	0%	0%	0%
8	propane	6	5	4	0%	0%	0%
9	propene	0	0	0	0%	0%	0%
10	methylpropane	166	120	122	1%	1%	1%
11	ethyne	0	0	0	0%	0%	0%
12	n-butane	7822	5713	5260	55%	56%	52%
13	propadiene	0	0	0	0%	0%	0%
14	trans-2-butene	13	9	0	0%	0%	0%
15	1-butene	0	0	0	0%	0%	0%
16	2-methylpropene	0	0	0	0%	0%	0%
17	cis-2-butene	14	10	10	0%	0%	0%
18	2,2-dimethylpropane	64	47	50	0%	0%	0%
19	methylbutane	2001	1488	1591	14%	15%	16%
20	1-propyne	0	0	0	0%	0%	0%
21	n-pentane	680	509	549	5%	5%	5%
22	1,3-butadiene	0	0	0	0%	0%	0%
23	3-methyl-1-butene	0	0	0	0%	0%	0%
24	cyclopentene	11	0	0	0%	0%	0%
25	trans-2-pentene	37	27	28	0%	0%	0%
26	2-methyl-2-butene	47	34	33	0%	0%	0%
27	1-pentene	16	12	13	0%	0%	0%
28	2-methyl-1-butene	27	21	23	0%	0%	0%
29	cis-2-pentene	20	16	16	0%	0%	0%
30	1-buten-3-yne	0	0	0	0%	0%	0%
31	2-butyne	0	0	0	0%	0%	0%
32	1-butyne	0	0	0	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0%	0%	0%
44	Light End	10922	8012	7700	76%	79%	76%
45							
46							
47	MID-RANGE HYDROCARBONS						
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
49		ug/ml	ug/ml	ug/ml			
50	2-methyl-1,3-butadiene	0	0	0	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0%	0%	0%
52	1,3-pentadiene	0	0	0	0%	0%	0%
53	cyclopentadiene	0	0	0	0%	0%	0%
54	2,2-dimethylbutane	55	44	43	0%	0%	0%
55	3-methyl-1-pentene	0	0	0	0%	0%	0%
56	cyclopentane	23	19	19	0%	0%	0%
57	2,3-dimethylbutane	109	85	88	1%	1%	1%
58	1-methyl-tert-butyl-ether	188	137	146	1%	1%	1%
59	2-methylpentane	256	192	200	2%	2%	2%
60	4-methyl-cis-2-pentene	0	0	0	0%	0%	0%
61	3-methylpentane	127	92	97	1%	1%	1%

Vapor Composition
Mass Concentration
E85-Drum

	A	B	C	D	E	F	G
62	2-methyl-1-pentene	0	0	0	0%	0%	0%
63	n-hexane	114	90	95	1%	1%	1%
64	trans-3-hexene	0	0	0	0%	0%	0%
65	trans-2-hexene	0	0	0	0%	0%	0%
66	2-methyl-2-pentene	0	0	0	0%	0%	0%
67	3-methylcyclopentene	0	0	0	0%	0%	0%
68	cis-2-hexene	0	0	0	0%	0%	0%
69	3-methyl-cis-2-pentene	0	0	0	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0%	0%	0%
71	methylcyclopentane	55	42	44	0%	0%	0%
72	2,4-dimethylpentane	90	71	80	1%	1%	1%
73	2,2,3-trimethylbutane	0	0	0	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0%	0%	0%
76	benzene	63	30	18	0%	0%	0%
77	3-methyl-1-hexene	0	0	0	0%	0%	0%
78	3,3-dimethylpentane	0	0	0	0%	0%	0%
79	cyclohexane	37	0	0	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0%	0%	0%
81	2-methylhexane	0	0	0	0%	0%	0%
82	2,3-dimethylpentane	153	115	132	1%	1%	1%
83	cyclohexene	0	0	0	0%	0%	0%
84	3-methylhexane	45	26	45	0%	0%	0%
85	1-heptene	0	0	0	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	0	0	0	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	0	0	0	0%	0%	0%
88	3-ethylpentane	0	0	0	0%	0%	0%
89	2,2,4-trimethylpentane	191	135	148	1%	1%	1%
90	3-methyl-trans-3-hexene	0	0	0	0%	0%	0%
91	n-heptane	50	0	17	0%	0%	0%
92	2-methyl-trans-2-hexene	0	0	0	0%	0%	0%
93	trans-2-heptene	0	0	0	0%	0%	0%
94	2-methyl-cis-2-hexene	0	0	0	0%	0%	0%
95	cis-2-heptene	0	0	0	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0%	0%	0%
97	methylcyclohexane	20	0	0	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0%	0%	0%
100	2,5-dimethylhexane	17	0	0	0%	0%	0%
101	2,4-dimethylhexane	16	0	0	0%	0%	0%
102	3,3-dimethylhexane	0	0	0	0%	0%	0%
103	2,3,4-trimethylpentane	28	20	20	0%	0%	0%
104	toluene	63	65	52	0%	1%	1%
105	2,3,3-trimethylpentane	0	0	0	0%	0%	0%
106	2,3-dimethylhexane	18	0	0	0%	0%	0%
107	2-methylheptane	0	0	0	0%	0%	0%
108	3-methylheptane	0	0	0	0%	0%	0%
109	2,2,5-trimethylhexane	0	0	0	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0%	0%	0%
111	octenes	0	0	0	0%	0%	0%
112	n-octane	0	0	0	0%	0%	0%
113	trans-2-octene	0	0	0	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
115	cis-2-octene	0	0	0	0%	0%	0%
116	2,3,5-trimethylhexane	0	0	0	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0%	0%	0%
118	2,6-dimethylheptane	0	0	0	0%	0%	0%
119	3,5-dimethylheptane	0	0	0	0%	0%	0%
120	ethylbenzene	0	0	0	0%	0%	0%
121	2,3-dimethylheptane	0	0	0	0%	0%	0%
122	m- & p-xylene	22	29	37	0%	0%	0%

Vapor Composition
Mass Concentration
E85-Drum

	A	B	C	D	E	F	G
123	4-methyloctane	0	0	0	0%	0%	0%
124	3-methyloctane	0	0	0	0%	0%	0%
125	styrene (ethenylbenzene)	0	0	0	0%	0%	0%
126	o-xylene	0	0	0	0%	0%	0%
127	2,2,4-trimethylheptane	0	0	0	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0%	0%	0%
129	n-nonane	0	0	0	0%	0%	0%
130	(1-methylethyl)benzene	0	0	0	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0%	0%	0%
135	n-propylbenzene	0	0	0	0%	0%	0%
136	1-methyl-3-ethylbenzene	0	0	0	0%	0%	0%
137	1-methyl-4-ethylbenzene	0	0	0	0%	0%	0%
138	1,3,5-trimethylbenzene	0	0	2	0%	0%	0%
139	1-methyl-2-ethylbenzene	0	0	0	0%	0%	0%
140	1,2,4-trimethylbenzene	0	0	0	0%	0%	0%
141	n-decane	68	0	0	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0%	0%	0%
145	1,2,3-trimethylbenzene	0	0	0	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0%	0%	0%
147	2,3-dihydroindene (indan)	0	0	0	0%	0%	0%
148	1,3-diethylbenzene	0	0	0	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0%	0%	0%
150	1,4-diethylbenzene	0	0	0	0%	0%	0%
151	1-methyl-3-n-propylbenzene	0	0	0	0%	0%	0%
152	(1,1-dimethylethyl)benzene	0	0	0	0%	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
158	n-undecane (hendecane)	0	0	0	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	0	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	0	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
162	C11 aromatic	0	0	0	0%	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	0	0%	0%	0%
164	n-pentylbenzene	0	0	0	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0	0%	0%	0%
166	naphthalene	0	0	0	0%	0%	0%
167	n-dodecane	0	0	0	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0%	0%	0%
171	1-hexene	0	0	0	0%	0%	0%
172	cis-3-hexene	0	0	0	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0%	0%	0%
174	trans-3-heptene	0	0	0	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0%	0%	0%
178	4-methylheptane	0	0	0	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0%	0%	0%
182	1-octene	0	0	0	0%	0%	0%
183	trans-4-octene	0	0	0	0%	0%	0%

Vapor Composition
Mass Concentration
E85-Drum

	A	B	C	D	E	F	G
184	cis-1,2-dimethylcyclohexane	0	0	0	0%	0%	0%
185	ethylcyclohexane	0	0	0	0%	0%	0%
186	1-nonene	0	0	0	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene*	0	0	0	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0%	0%	0%
194	Mid-Range	1808	1191	1283	13%	12%	13%
195							
196	NMHC	12730	9202	8984	89%	90%	89%
197							
198	ALCOHOLS						
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
200		ug/ml	ug/ml	ug/ml			
201	Methanol	0	0	0	0%	0%	0%
202	Ethanol	1587	992	1138	11%	10%	11%
203	Alcohols	1587	992	1138	11%	10%	11%
204							
205							
206	CARBONYLS						
207	COMPOUND						
208							
209	Formaldehyde	0	0	0	0%	0%	0%
210	Acetaldehyde	0	0	0	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0%	0%	0%
216	Methacrolein	0	0	0	0%	0%	0%
217	Benzaldehyde	0	0	0	0%	0%	0%
218	Crotonaldehdye	0	0	0	0%	0%	0%
219	Valeraldehyde	0	0	0	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0%	0%	0%
221	Hexanal	0	0	0	0%	0%	0%
222	Carbonyls	0	0	0	0%	0%	0%
223							
224	Total NMOG	14317	10194	10122	100%	100%	100%
225							
226	NOTES						
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)						
228	PPB = PPBC / Carbon Number						
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)						
230	Tests with inconsistent results are excluded.						

Vapor Composition
Mass Concentration
E85-Vehicle

	A	B	C	D	E	F	G
1		E85-80-	E85-40-	E85-10-	E85-80-	E85-40-	E85-10-
2		VW	VW	VW	VW	VW	VW
3	LIGHT END HYDROCARBONS	VR75	VR77	VR79	VR75	VR77	VR79
4	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
5		ug/ml	ug/ml	ug/ml			
6	ethane	0	0	0	0%	0%	0%
7	ethene	1	1	0	0%	0%	0%
8	propane	4	7	8	0%	0%	0%
9	propene	0	0	0	0%	0%	0%
10	methylpropane	189	196	147	1%	1%	1%
11	ethyne	1	1	2	0%	0%	0%
12	n-butane	8853	9624	7343	58%	55%	57%
13	propadiene	0	0	0	0%	0%	0%
14	trans-2-butene	14	15	12	0%	0%	0%
15	1-butene	0	0	0	0%	0%	0%
16	2-methylpropene	0	0	0	0%	0%	0%
17	cis-2-butene	15	16	13	0%	0%	0%
18	2,2-dimethylpropane	72	79	61	0%	0%	0%
19	methylbutane	2173	2501	1985	14%	14%	15%
20	1-propyne	0	0	0	0%	0%	0%
21	n-pentane	710	830	661	5%	5%	5%
22	1,3-butadiene	0	0	0	0%	0%	0%
23	3-methyl-1-butene	0	0	0	0%	0%	0%
24	cyclopentene	0	11	0	0%	0%	0%
25	trans-2-pentene	38	43	36	0%	0%	0%
26	2-methyl-2-butene	51	57	47	0%	0%	0%
27	1-pentene	16	19	15	0%	0%	0%
28	2-methyl-1-butene	27	30	26	0%	0%	0%
29	cis-2-pentene	20	23	19	0%	0%	0%
30	1-buten-3-yne	0	0	0	0%	0%	0%
31	2-butyne	0	0	0	0%	0%	0%
32	1-butyne	13	15	12	0%	0%	0%
33	Light-end-unidentified-1	0	0	0	0%	0%	0%
34	Light-end-unidentified-2	0	0	0	0%	0%	0%
35	Light-end-unidentified-3	0	0	0	0%	0%	0%
36	Light-end-unidentified-4	0	0	0	0%	0%	0%
37	Light-end-unidentified-5	0	0	0	0%	0%	0%
38	Light-end-unidentified-6	0	0	0	0%	0%	0%
39	Light-end-unidentified-7	0	0	0	0%	0%	0%
40	Light-end-unidentified-8	0	0	0	0%	0%	0%
41	Light-end-unidentified-9	0	0	0	0%	0%	0%
42	Light-end-unidentified-10	0	0	0	0%	0%	0%
43	Light-end-unidentified-11	0	0	0	0%	0%	0%
44	Light End	12197	13468	10388	80%	77%	81%
45							
46							
47	MID-RANGE HYDROCARBONS						
48	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
49		ug/ml	ug/ml	ug/ml			
50	2-methyl-1,3-butadiene	0	0	0	0%	0%	0%
51	3,3-dimethyl-1-butene	0	0	0	0%	0%	0%
52	1,3-pentadiene	0	0	0	0%	0%	0%
53	cyclopentadiene	0	0	0	0%	0%	0%
54	2,2-dimethylbutane	48	56	56	0%	0%	0%
55	3-methyl-1-pentene	0	0	0	0%	0%	0%
56	cyclopentane	24	27	26	0%	0%	0%
57	2,3-dimethylbutane	102	118	119	1%	1%	1%
58	1-methyl-tert-butyl-ether	202	242	213	1%	1%	2%
59	2-methylpentane	225	261	257	1%	1%	2%
60	4-methyl-cis-2-pentene	0	0	0	0%	0%	0%
61	3-methylpentane	102	120	118	1%	1%	1%

Vapor Composition
Mass Concentration
E85-Vehicle

	A	B	C	D	E	F	G
62	2-methyl-1-pentene	0	0	0	0%	0%	0%
63	n-hexane	112	129	128	1%	1%	1%
64	trans-3-hexene	0	0	0	0%	0%	0%
65	trans-2-hexene	11	12	12	0%	0%	0%
66	2-methyl-2-pentene	0	0	0	0%	0%	0%
67	3-methylcyclopentene	0	0	0	0%	0%	0%
68	cis-2-hexene	0	0	0	0%	0%	0%
69	3-methyl-cis-2-pentene	0	0	0	0%	0%	0%
70	2,2-dimethylpentane	0	0	0	0%	0%	0%
71	methylcyclopentane	51	58	58	0%	0%	0%
72	2,4-dimethylpentane	87	101	98	1%	1%	1%
73	2,2,3-trimethylbutane	0	0	0	0%	0%	0%
74	3,4-dimethyl-1-pentene	0	0	0	0%	0%	0%
75	1-methylcyclopentene	0	0	0	0%	0%	0%
76	benzene	28	30	27	0%	0%	0%
77	3-methyl-1-hexene	0	0	0	0%	0%	0%
78	3,3-dimethylpentane	0	0	0	0%	0%	0%
79	cyclohexane	0	0	0	0%	0%	0%
80	4-methyl-trans-2-hexene	0	0	0	0%	0%	0%
81	2-methylhexane	0	0	0	0%	0%	0%
82	2,3-dimethylpentane	139	169	163	1%	1%	1%
83	cyclohexene	0	0	0	0%	0%	0%
84	3-methylhexane	36	40	39	0%	0%	0%
85	1-heptene	0	0	0	0%	0%	0%
86	trans-1,3-dimethylcyclopentane	0	0	0	0%	0%	0%
87	cis-1,3-dimethylcyclopentane	0	0	0	0%	0%	0%
88	3-ethylpentane	9	10	0	0%	0%	0%
89	2,2,4-trimethylpentane	176	201	195	1%	1%	2%
90	3-methyl-trans-3-hexene	0	0	0	0%	0%	0%
91	n-heptane	23	25	21	0%	0%	0%
92	2-methyl-trans-2-hexene	0	0	0	0%	0%	0%
93	trans-2-heptene	0	0	0	0%	0%	0%
94	2-methyl-cis-2-hexene	0	0	0	0%	0%	0%
95	cis-2-heptene	0	0	0	0%	0%	0%
96	2,4-dimethyl-2-pentene	0	0	0	0%	0%	0%
97	methylcyclohexane	11	11	12	0%	0%	0%
98	2,2-dimethylhexane	0	0	0	0%	0%	0%
99	2,4,4-trimethyl-2-pentene	0	0	0	0%	0%	0%
100	2,5-dimethylhexane	15	15	15	0%	0%	0%
101	2,4-dimethylhexane	16	17	17	0%	0%	0%
102	3,3-dimethylhexane	0	0	0	0%	0%	0%
103	2,3,4-trimethylpentane	33	35	32	0%	0%	0%
104	toluene	81	77	64	1%	0%	0%
105	2,3,3-trimethylpentane	0	0	0	0%	0%	0%
106	2,3-dimethylhexane	12	13	0	0%	0%	0%
107	2-methylheptane	15	0	0	0%	0%	0%
108	3-methylheptane	14	12	13	0%	0%	0%
109	2,2,5-trimethylhexane	13	12	11	0%	0%	0%
110	1-methyl-trans-3-ethylcyclopentane	0	0	0	0%	0%	0%
111	octenes	0	0	0	0%	0%	0%
112	n-octane	9	0	0	0%	0%	0%
113	trans-2-octene	0	0	0	0%	0%	0%
114	trans-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
115	cis-2-octene	0	0	0	0%	0%	0%
116	2,3,5-trimethylhexane	0	0	0	0%	0%	0%
117	2,4-dimethylheptane	0	0	0	0%	0%	0%
118	2,6-dimethylheptane	0	0	0	0%	0%	0%
119	3,5-dimethylheptane	0	0	0	0%	0%	0%
120	ethylbenzene	30	23	15	0%	0%	0%
121	2,3-dimethylheptane	0	0	0	0%	0%	0%
122	m- & p-xylene	50	39	21	0%	0%	0%

Vapor Composition
Mass Concentration
E85-Vehicle

	A	B	C	D	E	F	G
123	4-methyloctane	0	0	0	0%	0%	0%
124	3-methyloctane	0	0	0	0%	0%	0%
125	styrene (ethenylbenzene)	0	0	0	0%	0%	0%
126	o-xylene	18	13	18	0%	0%	0%
127	2,2,4-trimethylheptane	0	0	0	0%	0%	0%
128	1-methyl-4-ethylcyclohexane	0	0	0	0%	0%	0%
129	n-nonane	0	0	0	0%	0%	0%
130	(1-methylethyl)benzene	0	0	0	0%	0%	0%
131	2,2-dimethyloctane	0	0	0	0%	0%	0%
132	2,5-dimethyloctane	0	0	0	0%	0%	0%
133	2,4-dimethyloctane	0	0	0	0%	0%	0%
134	2,6-dimethyloctane	0	0	0	0%	0%	0%
135	n-propylbenzene	0	0	0	0%	0%	0%
136	1-methyl-3-ethylbenzene	21	12	0	0%	0%	0%
137	1-methyl-4-ethylbenzene	10	0	0	0%	0%	0%
138	1,3,5-trimethylbenzene	12	0	0	0%	0%	0%
139	1-methyl-2-ethylbenzene	9	0	0	0%	0%	0%
140	1,2,4-trimethylbenzene	27	11	6	0%	0%	0%
141	n-decane	0	0	0	0%	0%	0%
142	(2-methylpropyl)benzene	0	0	0	0%	0%	0%
143	(1-methylpropyl)benzene	0	0	0	0%	0%	0%
144	1-methyl-3-(1-methylethyl)benzene	0	0	0	0%	0%	0%
145	1,2,3-trimethylbenzene	0	0	0	0%	0%	0%
146	1-methyl-4-(1-methylethyl)benzene	0	0	0	0%	0%	0%
147	2,3-dihydroindene (indan)	0	0	0	0%	0%	0%
148	1,3-diethylbenzene	0	0	0	0%	0%	0%
149	1-methyl-2-(1-methylethyl)benzene	0	0	0	0%	0%	0%
150	1,4-diethylbenzene	0	0	0	0%	0%	0%
151	1-methyl-3-n-propylbenzene	0	0	0	0%	0%	0%
152	(1,1-dimethylethyl)benzene	0	0	0	0%	0%	0%
153	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
154	1,4-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
155	1,3-dimethyl-4-ethylbenzene	0	0	0	0%	0%	0%
156	1,2-dimethyl-4-ethylbenzene	9	0	0	0%	0%	0%
157	1,3-dimethyl-2-ethylbenzene	0	0	0	0%	0%	0%
158	n-undecane (hendecane)	0	0	0	0%	0%	0%
159	1,2-dimethyl-3-ethylbenzene	0	0	0	0%	0%	0%
160	1,2,4,5-tetramethylbenzene	0	0	0	0%	0%	0%
161	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
162	C11 aromatic	0	0	0	0%	0%	0%
163	1-methyl-2-n-butylbenzene	0	0	0	0%	0%	0%
164	n-pentylbenzene	0	0	0	0%	0%	0%
165	1-(1,1-dimethylethyl)-3,5-DMbenzene	0	0	0	0%	0%	0%
166	naphthalene	10	0	0	0%	0%	0%
167	n-dodecane	0	0	0	0%	0%	0%
168	1-ethyl-tert-butyl-ether	0	0	0	0%	0%	0%
169	4-methyl-t-2-pentene	0	0	0	0%	0%	0%
170	4-methyl-1-pentene	0	0	0	0%	0%	0%
171	1-hexene	0	0	0	0%	0%	0%
172	cis-3-hexene	0	0	0	0%	0%	0%
173	3-methyl-t-2-pentene	0	0	0	0%	0%	0%
174	trans-3-heptene	0	0	0	0%	0%	0%
175	3-ethyl-c-2-pentene	0	0	0	0%	0%	0%
176	2,3-dimethyl-2-pentene	0	0	0	0%	0%	0%
177	2,4,4-trimethyl-1-pentene	0	0	0	0%	0%	0%
178	4-methylheptane	0	0	0	0%	0%	0%
179	1-cis,2-trans,3-trimethylcyclopentane	0	0	0	0%	0%	0%
180	cis-1,3-dimethylcyclohexane	0	0	0	0%	0%	0%
181	trans-1,4-dimethylcyclohexane	0	0	0	0%	0%	0%
182	1-octene	0	0	0	0%	0%	0%
183	trans-4-octene	0	0	0	0%	0%	0%

Vapor Composition
Mass Concentration
E85-Vehicle

	A	B	C	D	E	F	G
184	cis-1,2-dimethylcyclohexane	0	0	0	0%	0%	0%
185	ethylcyclohexane	0	0	0	0%	0%	0%
186	1-nonene	0	0	0	0%	0%	0%
187	1-methyl-4-n-propylbenzene	0	0	0	0%	0%	0%
188	1,2-diethylbenzene	0	0	0	0%	0%	0%
189	1-methyl-2-n-propylbenzene	0	0	0	0%	0%	0%
190	1,2,3,5-tetramethylbenzene	0	0	0	0%	0%	0%
191	1-(1,1-dimethylethyl)-2-methylbenzene***	0	0	0	0%	0%	0%
192	1,2,3,4-tetramethylbenzene	0	0	0	0%	0%	0%
193	trans-1,2-dimethylcyclopentane	0	0	0	0%	0%	0%
194	Mid-Range	1790	1890	1754	12%	11%	14%
195							
196	NMHC	13987	15358	12142	92%	88%	94%
197							
198	ALCOHOLS						
199	COMPOUND	Mass Conc.	Mass Conc.	Mass Conc.	Weight %	Weight %	Weight %
200		ug/ml	ug/ml	ug/ml			
201	Methanol	0	0	0	0%	0%	0%
202	Ethanol	1167	2106	745	8%	12%	6%
203	Alcohols	1167	2106	745	8%	12%	6%
204							
205							
206	CARBONYLS						
207	COMPOUND						
208							
209	Formaldehyde	0	0	0	0%	0%	0%
210	Acetaldehyde	0	0	0	0%	0%	0%
211	Acrolein (Propenal)	0	0	0	0%	0%	0%
212	Acetone (2-Propanone)	0	0	0	0%	0%	0%
213	Propionaldehyde (Propanal)	0	0	0	0%	0%	0%
214	Butyraldehyde (Butanal)	0	0	0	0%	0%	0%
215	Methyl Ethyl Ketone	0	0	0	0%	0%	0%
216	Methacrolein	0	0	0	0%	0%	0%
217	Benzaldehyde	0	0	0	0%	0%	0%
218	Crotonaldehdye	0	0	0	0%	0%	0%
219	Valeraldehyde	0	0	0	0%	0%	0%
220	m-Tolualdehyde	0	0	0	0%	0%	0%
221	Hexanal	0	0	0	0%	0%	0%
222	Carbonyls	0	0	0	0%	0%	0%
223							
224	Total NMOG	15154	17463	12887	100%	100%	100%
225							
226	NOTES						
227	Parts per Billion Carbon (PPBC) measured by Gas Chromatograph (GC)						
228	PPB = PPBC / Carbon Number						
229	Mass Concentration = PPBC / Carbon Number * Molecular Weight / Molecular Volume (Molecular Volume = 24.055)						
230	Tests with inconsistent results are excluded.						

DHA049.DHA

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board
Southern Laboratory Branch / IAS

File: DHA049.RUN
Sample: PH2-100,062894
Method: DHA049.MTH
Processed 384 Peaks
DETAILED HC ANALYSIS OF GASOLINE

Analyzed: 18-JUL-94 11:39 AM
Reported: 07-27-1994 13:37:51
DHA DBase File: RI_B-M85.DBF
Normalized to 100.00%

Composite Report
Totals by Group Type & Carbon Number
(in Weight Percent)

	Paraffins:	I-paraffins:	Aromatics:	Naphthenes:	Olefins:	Total:
C1:	0.000	0.000	0.000	0.000	0.000	0.000
C2:	0.000	0.000	0.000	0.000	0.000	0.000
C3:	0.004	0.000	0.000	0.000	0.000	0.004
C4:	1.286	0.073	0.000	0.000	0.101	1.460
C5:	1.488	8.088	0.000	0.065	1.243	10.883
C6:	0.988	6.659	0.998	0.559	1.361	10.565
C7:	0.789	9.704	7.409	0.838	1.204	19.944
C8:	0.579	17.859	12.230	1.008	0.189	31.866
C9:	0.105	3.340	4.756	0.415	0.080	8.696
C10:	0.024	1.093	2.572	0.036	0.007	3.732
C11:	0.012	0.078	0.509	0.016	0.004	0.619
C12:	0.010	0.088	0.223	0.000	0.000	0.321
C13:	0.008	0.003	0.000	0.000	0.000	0.011
Total	5.291	46.983	28.698	2.938	4.190	88.100

Oxygenates: 11.131 Total C14+: 0.166

Total Unknowns: 0.604
Grand Total: 100.000

DHA049.DHA

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board
Southern Laboratory Branch / IAS

File: DHA049.RUN
Sample: PH2-100,062894
Method: DHA049.MTH
Processed 384 Peaks
DETAILED HC ANALYSIS OF GASOLINE

Analyzed: 18-JUL-94 11:39 AM
Reported: 07-27-1994 13:37:51
DHA DBase File: RI_B-M85.DBF
Normalized to 100.00%

Composite Report
Totals by Group Type & Carbon Number
(in Volume Percent)

	Paraffins:	I-paraffins:	Aromatics:	Naphthenes:	Olefins:	Total:
C1:	0.000	0.000	0.000	0.000	0.000	0.000
C2:	0.000	0.000	0.000	0.000	0.000	0.000
C3:	0.006	0.000	0.000	0.000	0.000	0.006
C4:	1.629	0.096	0.000	0.000	0.122	1.846
C5:	1.743	9.575	0.000	0.064	1.384	12.766
C6:	1.099	7.431	0.833	0.546	1.424	11.332
C7:	0.846	10.373	6.268	0.816	1.246	19.548
C8:	0.605	18.662	10.345	0.958	0.191	30.761
C9:	0.107	3.407	4.009	0.389	0.083	7.995
C10:	0.024	1.088	2.115	0.033	0.007	3.267
C11:	0.011	0.077	0.382	0.015	0.004	0.489
C12:	0.009	0.086	0.184	0.000	0.000	0.279
C13:	0.008	0.003	0.000	0.000	0.000	0.011
Total	6.087	50.796	24.136	2.821	4.460	88.300

Oxygenates: 11.022 Total C14+: 0.159

Total Unknowns: 0.519
Grand Total: 100.000

DHA049.DHA

(in Mole Percent)

	Paraffins:	I-paraffins:	Aromatics:	Naphthenes:	Olefins:	Total:
C1:	0.000	0.000	0.000	0.000	0.000	0.000
C2:	0.000	0.000	0.000	0.000	0.000	0.000
C3:	0.008	0.000	0.000	0.000	0.000	0.008
C4:	2.148	0.121	0.000	0.000	0.175	2.445
C5:	2.003	10.887	0.000	0.090	1.724	14.703
C6:	1.113	7.504	1.241	0.646	1.577	12.081
C7:	0.764	9.405	7.809	0.829	1.193	20.001
C8:	0.492	15.184	11.188	0.872	0.162	27.899
C9:	0.079	2.529	3.843	0.319	0.062	6.832
C10:	0.016	0.746	1.888	0.025	0.005	2.680
C11:	0.007	0.048	0.342	0.010	0.003	0.410
C12:	0.006	0.050	0.133	0.000	0.000	0.189
C13:	0.004	0.002	0.000	0.000	0.000	0.006
Total	6.642	46.476	26.444	2.791	4.901	87.254

Oxygenates: 12.234 Total C14+: 0.081

Total Unknowns: 0.430
Grand Total: 100.000

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board

File: DHA049.RUN Analyzed: 18-JUL-94 11:39 AM
Sample: PH2-100,062894 Reported: 07-27-1994 13:37:51
Method: DHA049.MTH DHA DBase File: RI_B-M85.DBF
Processed 384 Peaks Normalized to 100.00%

DETAILED HC ANALYSIS OF GASOLINE

Components Listed in Chromatographic Order

Component	Wt%	Vol%	Mol%
propane	0.004	0.006	0.008
i-butane	0.073	0.096	0.121
butene-1	0.010	0.012	0.017
isobutylene	0.007	0.009	0.012
n-butane	1.286	1.629	2.148
t-butene-2	0.037	0.045	0.065
2,2-dimethylpropane	0.016	0.019	0.021
c-butene-2	0.047	0.056	0.082
3-methylbutene-1	0.024	0.028	0.033
i-pentane	8.072	9.556	10.866
pentene-1	0.089	0.102	0.123
2-methylbutene-1	0.179	0.202	0.248
n-pentane	1.488	1.743	2.003
isoprene	0.002	0.003	0.003
t-pentene-2	0.277	0.314	0.384
3,3-dimethylbutene-1	0.004	0.004	0.005
c-pentene-2	0.154	0.172	0.213
t-butanol	0.010	0.009	0.013
2-methylbutene-2	0.443	0.491	0.614
1t,3-pentadiene	0.010	0.010	0.014
cyclopentadiene	0.002	0.002	0.002
2,2-dimethylbutane	0.556	0.628	0.626
cyclopentene	0.059	0.056	0.084
4-methylpentene-1	0.021	0.023	0.024
3-methylpentene-1	0.033	0.036	0.038
cyclopentane	0.065	0.064	0.090
2,3-dimethylbutane	1.560	1.729	1.758
methyl-t-butylether	10.913	10.810	12.023
2,3-dimethylbutene-1	0.028	0.030	0.032
2-methylpentane	2.998	3.367	3.379
4-methyl-t-pentene-2	0.075	0.081	0.086
3-methylpentane	1.545	1.706	1.741
2-methylpentene-1	0.114	0.122	0.131
hexene-1	0.074	0.080	0.085
n-hexane	0.988	1.099	1.113

t-hexene-3	0.093	0.100	0.107
c-hexene-3	0.031	0.034	0.036
t-hexene-2	0.184	0.197	0.212
2-methylpentene-2	0.240	0.255	0.277
3-methyl-c-pentene-2	0.120	0.126	0.138
3-methylcyclopentene	0.024	0.023	0.028
c-hexene-2	0.103	0.109	0.119
3,3-dimethylpentene-1	0.190	0.199	0.188
2,2-dimethylpentane	0.074	0.080	0.071
methylcyclopentane	0.494	0.484	0.570
2,4-dimethylpentane	2.440	2.661	2.365
cyclic diolefin or triolefin	0.004	0.004	0.005
2,2,3-trimethylbutane	0.035	0.037	0.034
cyclic diolefin or triolefin	0.003	0.003	0.004
O17	0.003	0.003	0.003
3,4-dimethylpentene-1	0.006	0.006	0.006
4,4-dimethyl-c-pentene-2	0.014	0.014	0.014
2,4-dimethylpentene-1	0.009	0.010	0.009
1-methylcyclopentene	0.189	0.178	0.223
benzene	0.998	0.833	1.241
3-methylhexene-1	0.015	0.015	0.014
2-methyl-c-hexene-3	0.009	0.010	0.009
3,3-dimethylpentane	0.074	0.078	0.072
5-methylhexene-1	0.020	0.021	0.020
cyclohexane	0.065	0.062	0.075
2-methyl-t-hexene-3	0.033	0.035	0.033
2-ethyl-3-methylbutene-1	0.005	0.005	0.005
4-methylhexene-1	0.021	0.021	0.020
4-methyl-t/c-hexene-2	0.062	0.064	0.061
2-methylhexane	1.154	1.247	1.118
2,3-dimethylpentane	4.503	4.752	4.365
1,1-dimethylcyclopentane	0.030	0.029	0.030
t-amylmethylether	0.208	0.203	0.197
cyclohexene	0.032	0.029	0.038
3-methylhexane	1.271	1.357	1.232
3,4-dimethyl-c-pentene-2	0.023	0.023	0.023
1c,3-dimethylcyclopentane	0.162	0.159	0.160
1t,3-dimethylcyclopentane	0.144	0.141	0.142
3-ethylpentane	0.153	0.161	0.148
1t,2-dimethylcyclopentane	0.104	0.102	0.103
2,2,4-trimethylpentane	8.681	9.203	7.381
3-methyl-c-hexene-3	0.039	0.039	0.038
t-heptene-3	0.145	0.151	0.143
n-heptane	0.789	0.846	0.764
3-methyl-c-hexene-2	0.166	0.171	0.165
3-methyl-t-hexene-3	0.059	0.063	0.059
t-heptene-2	0.074	0.077	0.074
3-ethylpentene-2	0.035	0.035	0.034
c-heptene-2	0.127	0.131	0.126

2,3-dimethylpentene-2	0.071	0.071	0.070
3-ethylcyclopentene	0.005	0.004	0.005
O29	0.009	0.009	0.009
1c,2-dimethylcyclopentane	0.092	0.093	0.091
methylcyclohexane	0.209	0.199	0.207
2,2-dimethylhexane	0.094	0.099	0.080
O35	0.006	0.006	0.006
O36	0.005	0.005	0.005
ethylcyclopentane	0.097	0.093	0.096
2,5-dimethylhexane	0.757	0.800	0.643
2,2,3-trimethylpentane	0.162	0.166	0.137
2,4-dimethylhexane	1.092	1.144	0.929
?	0.007	0.007	0.006
1c,2t,4-trimethylcyclopentane	0.072	0.069	0.062
3,3-dimethylhexane	0.054	0.056	0.046
O38	0.003	0.003	0.003
?	0.005	0.005	0.005
?	0.012	0.012	0.012
1t,2c,3-trimethylcyclopentane	0.045	0.043	0.039
O39	0.008	0.008	0.008
2,3,4-trimethylpentane	2.451	2.501	2.084
I1	0.109	0.112	0.093
O40	0.036	0.036	0.035
2,3,3-trimethylpentane	1.636	1.652	1.391
toluene	7.409	6.268	7.809
O42	0.018	0.018	0.015
O43	0.028	0.028	0.024
2,3-dimethylhexane	0.872	0.898	0.741
2-methyl-3-ethylpentane	0.056	0.058	0.048
1,1,2-trimethylcyclopentane	0.028	0.027	0.024
O44	0.043	0.043	0.037
2-methylheptane	0.636	0.669	0.541
4-methylheptane	0.284	0.296	0.242
3-methyl-3-ethylpentane	0.107	0.110	0.091
3,4-dimethylhexane	0.111	0.113	0.094
1c,3-dimethylcyclohexane	0.059	0.056	0.051
3-methylheptane	0.719	0.747	0.611
1c,2t,3-trimethylcyclopentane	0.220	0.209	0.190
3-ethylhexane	0.038	0.039	0.032
1t,4-dimethylcyclohexane	0.033	0.032	0.029
?	0.006	0.006	0.005
1,3-octadiene	0.005	0.005	0.005
1,1-dimethylcyclohexane	0.005	0.005	0.004
2,2,5-trimethylhexane	1.112	1.153	0.842
3c-ethylmethylcyclopentane	0.090	0.086	0.078
2,6-dimethylheptene-1	0.012	0.012	0.009
3t-ethylmethylcyclopentane	0.060	0.057	0.052
2t-ethylmethylcyclopentane	0.047	0.045	0.041
1,1-methylethylcyclopentane	0.017	0.016	0.015

?	0.021	0.020	0.018
2,2,4-trimethylhexane	0.025	0.025	0.019
1t,2-dimethylcyclohexane	0.062	0.058	0.053
t-octene-4	0.035	0.035	0.030
1c,2c,3-trimethylcyclopentane	0.096	0.091	0.083
1t,3-dimethylcyclohexane	0.024	0.023	0.021
n-octane	0.579	0.605	0.492
octene-2	0.041	0.042	0.036
I2	0.066	0.066	0.050
?	0.036	0.036	0.027
i-propylcyclopentane	0.049	0.047	0.043
O52	0.005	0.006	0.004
O53	0.020	0.020	0.015
N1	0.008	0.007	0.007
2,2,3,4-tetramethylpentane	0.005	0.005	0.004
2,3,4-trimethylhexane	0.190	0.189	0.144
N2	0.026	0.024	0.022
?	0.009	0.008	0.008
N3	0.024	0.023	0.021
2,3,3-trimethylhexene-1	0.011	0.012	0.009
1c,2-dimethylcyclohexane	0.017	0.015	0.014
2,3,5-trimethylhexane	0.097	0.099	0.074
1,1,4-trimethylcyclohexane	0.068	0.065	0.053
N4	0.018	0.017	0.016
2,2,3-trimethylhexane	0.061	0.062	0.046
2,4-dimethylheptane	0.007	0.007	0.005
4,4-dimethylheptane	0.033	0.034	0.025
?	0.007	0.007	0.005
2,5-dimethylheptane	0.189	0.193	0.143
3,3-dimethylheptane	0.039	0.040	0.030
2,6-dimethylheptane	0.013	0.013	0.010
1,1,3-trimethylcyclohexane	0.015	0.014	0.011
N8	0.008	0.008	0.007
ethylbenzene	3.121	2.640	2.855
?	0.069	0.058	0.063
I3	0.009	0.009	0.007
2-methyloctene-1	0.012	0.013	0.009
I4	0.009	0.009	0.007
1,3-dimethylbenzene	4.852	4.118	4.438
1,4-dimethylbenzene	2.091	1.781	1.912
2,3-dimethylheptane	0.102	0.103	0.077
3,4-dimethylheptane	0.033	0.033	0.025
3,4-dimethylheptane	0.029	0.029	0.022
N14	0.011	0.010	0.009
I5	0.048	0.048	0.037
4-ethylheptane	0.010	0.010	0.008
4-methyloctane	0.154	0.157	0.116
2-methyloctane	0.190	0.195	0.144
N15	0.014	0.013	0.010

1c,2t,3-trimethylcyclohexane	0.011	0.011	0.008
3-ethylheptane	0.049	0.050	0.037
3-methyloctane	0.213	0.217	0.161
1c,2t,4c-trimethylcyclohexane	0.041	0.039	0.031
1,2-dimethylbenzene	2.168	1.806	1.983
?	0.011	0.009	0.010
I6	0.037	0.037	0.028
I7	0.157	0.157	0.119
N18	0.022	0.020	0.017
N19	0.019	0.018	0.015
nonene-1	0.022	0.021	0.017
I8	0.012	0.013	0.009
I9	0.271	0.272	0.205
i-butylcyclopentane	0.009	0.008	0.007
N21	0.026	0.025	0.020
N22	0.025	0.024	0.019
N23/c-nonene-2	0.006	0.006	0.005
t-nonene-3	0.017	0.018	0.013
I10	0.180	0.180	0.136
n-nonane	0.105	0.107	0.079
1,1-methylethylcyclohexane	0.021	0.019	0.016
?	0.010	0.009	0.008
N25	0.013	0.012	0.010
t-2,2,5,5-tetramethylhexene-3	0.007	0.007	0.005
i-propylbenzene	0.087	0.074	0.070
N27	0.033	0.030	0.025
I11	0.014	0.014	0.010
i-propylcyclohexane	0.010	0.009	0.007
I12	0.107	0.107	0.073
2,2-dimethyloctane	0.031	0.031	0.021
2,4-dimethyloctane	0.028	0.029	0.019
N29	0.006	0.006	0.005
2,6-dimethyloctane	0.019	0.019	0.013
2,5-dimethyloctane	0.039	0.040	0.027
n-butylcyclopentane	0.065	0.060	0.050
N30	0.011	0.010	0.008
I14	0.003	0.003	0.002
3,3-dimethyloctane	0.030	0.029	0.020
n-propylbenzene	0.370	0.315	0.299
?	0.009	0.007	0.007
3,6-dimethyloctane	0.010	0.010	0.007
3-methyl-5-ethylheptane	0.006	0.006	0.004
1,3-methylethylbenzene	1.163	0.987	0.940
1,4-methylethylbenzene	0.505	0.430	0.408
1,3,5-trimethylbenzene	0.551	0.467	0.445
I15	0.014	0.014	0.009
5-methylnonane	0.013	0.013	0.009
I17	0.431	0.427	0.294
1,2-methylethylbenzene	0.309	0.257	0.250

2-methylnonane	0.035	0.035	0.024
?	0.003	0.003	0.002
3-ethyloctane	0.004	0.004	0.003
3-methylnonane	0.037	0.037	0.025
I18	0.108	0.107	0.074
I19	0.006	0.006	0.004
1,2,4-trimethylbenzene	1.511	1.265	1.221
I20	0.009	0.009	0.006
i-butylcyclohexane	0.005	0.005	0.004
I21	0.030	0.029	0.020
I22	0.034	0.034	0.023
I23	0.008	0.008	0.005
N37	0.004	0.004	0.003
I24	0.054	0.053	0.037
i-butylbenzene	0.036	0.031	0.026
I25	0.024	0.024	0.016
?	0.012	0.012	0.008
sec-butylbenzene	0.036	0.031	0.026
?	0.004	0.004	0.003
n-decane	0.024	0.024	0.016
I26	0.023	0.022	0.014
N38	0.008	0.008	0.006
1,2,3-trimethylbenzene	0.261	0.214	0.211
1,3-methyl-i-propylbenzene	0.039	0.033	0.028
1,4-methyl-i-propylbenzene	0.018	0.016	0.013
I29	0.010	0.010	0.006
2-3-dihydroindene	0.151	0.115	0.124
sec-butylcyclohexane	0.007	0.006	0.005
?	0.012	0.011	0.008
I30	0.010	0.010	0.006
1,2-methyl-i-propylbenzene	0.009	0.008	0.007
?	0.021	0.017	0.015
N40	0.014	0.013	0.009
I32	0.004	0.004	0.003
?	0.007	0.006	0.004
1,3-diethylbenzene	0.120	0.101	0.086
1,3-methyl-n-propylbenzene	0.240	0.205	0.174
I33	0.006	0.005	0.003
1,4-methyl-n-propylbenzene	0.143	0.122	0.103
n-butylbenzene	0.059	0.051	0.043
1,3-dimethyl-5-ethylbenzene	0.225	0.188	0.163
1,2-diethylbenzene	0.020	0.017	0.014
N41	0.002	0.002	0.002
1,2-methyl-n-propylbenzene	0.069	0.058	0.050
?	0.010	0.009	0.008
I37	0.012	0.012	0.008
I38	0.010	0.010	0.006
1,4,dimethyl-2-ethylbenzene	0.127	0.106	0.092
1,3-dimethyl-4-ethylbenzene	0.154	0.131	0.111

1,2-dimethyl-4-ethylbenzene	0.264	0.222	0.191
I41	0.002	0.002	0.001
1,3-dimethyl-2-ethylbenzene	0.011	0.009	0.008
I42	0.001	0.001	0.001
undecene-1	0.004	0.004	0.003
1,4-methyl-t-butylbenzene	0.016	0.014	0.010
1,2-dimethyl-3-ethylbenzene	0.057	0.047	0.041
1,2-ethyl-i-propylbenzene	0.005	0.004	0.003
?	0.003	0.003	0.002
n-undecane	0.012	0.011	0.007
1,2,4,5-tetramethylbenzene	0.111	0.092	0.081
1,2,3,5-tetramethylbenzene	0.151	0.125	0.110
?	0.006	0.005	0.004
?	0.004	0.004	0.003
?	0.004	0.003	0.003
1,2-methyl-t-butylbenzene	0.003	0.003	0.002
5-methylindan	0.127	0.104	0.093
I43	0.005	0.005	0.003
4-methylindan	0.035	0.029	0.025
1,2-ethyl-n-propylbenzene	0.049	0.040	0.032
2-methylindan	0.119	0.096	0.087
1,3-methyl-n-butylbenzene	0.007	0.006	0.005
1,3-di-i-propylbenzene	0.045	0.037	0.027
s-pentylbenzene	0.029	0.024	0.019
n-pentylbenzene	0.030	0.025	0.019
?	0.013	0.011	0.008
1,2-di-i-propylbenzene	0.020	0.017	0.012
?	0.020	0.016	0.012
?	0.022	0.018	0.013
1,4-di-i-propylbenzene	0.030	0.025	0.018
tetrahydronaphthalene	0.007	0.005	0.005
?	0.034	0.026	0.025
naphthalene	0.246	0.176	0.186
1,4-ethyl-t-butylbenzene	0.019	0.015	0.011
I45	0.031	0.031	0.018
I46	0.015	0.014	0.008
I47	0.021	0.020	0.012
I48	0.016	0.016	0.009
1,3-di-n-propylbenzene	0.027	0.022	0.016
A5	0.017	0.014	0.010
A6	0.014	0.011	0.008
n-dodecane	0.010	0.009	0.006
?	0.002	0.002	0.001
?	0.006	0.006	0.003
?	0.006	0.006	0.004
1,3,5-triethylbenzene	0.002	0.002	0.001
?	0.004	0.003	0.002
?	0.020	0.017	0.012
?	0.016	0.014	0.010

?	0.020	0.017	0.012
?	0.007	0.006	0.004
1,2,4-triethylbenzene	0.004	0.004	0.003
?	0.006	0.005	0.004
?	0.013	0.011	0.008
1,4-methyl-n-pentylbenzene	0.036	0.030	0.022
?	0.010	0.009	0.006
?	0.003	0.003	0.002
?	0.004	0.003	0.002
?	0.005	0.004	0.003
n-hexylbenzene	0.008	0.007	0.005
?	0.035	0.029	0.021
?	0.014	0.011	0.008
?	0.004	0.003	0.002
?	0.004	0.004	0.003
?	0.011	0.009	0.007
?	0.007	0.006	0.004
I49	0.003	0.003	0.002
?	0.002	0.002	0.001
1,2,3,4,5-pentamethylbenzene	0.032	0.023	0.021
?	0.005	0.004	0.003
2-methylnaphthalene	0.234	0.168	0.159
?	0.008	0.006	0.006
?	0.007	0.005	0.005
?	0.006	0.004	0.004
1-methylnaphthalene	0.105	0.075	0.071
n-tridecane	0.008	0.008	0.004
C14+	0.002	0.002	0.001
C14+	0.002	0.002	0.001
C14+	0.006	0.006	0.003
C14+	0.004	0.004	0.002
C14+	0.004	0.004	0.002
C14+	0.004	0.004	0.002
C14+	0.003	0.002	0.001
C14+	0.005	0.005	0.003
C14+	0.001	0.001	0.001
C14+	0.002	0.001	0.001
C14+	0.004	0.003	0.002
C14+	0.004	0.004	0.002
C14+	0.012	0.011	0.006
C14+	0.004	0.004	0.002
C14+	0.003	0.003	0.001
C14+	0.015	0.014	0.007
C14+	0.015	0.014	0.007
C14+	0.002	0.002	0.001
C14+	0.031	0.030	0.015
C14+	0.015	0.015	0.007
C14+	0.010	0.009	0.005
C14+	0.003	0.003	0.001

C14+	0.004	0.003	0.002
C14+	0.003	0.003	0.002
C14+	0.002	0.002	0.001
C14+	0.003	0.003	0.001
C14+	0.002	0.002	0.001
C14+	0.002	0.002	0.001

DHA050R.DHA

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board
Southern Laboratory Branch / IAS

File: DHA050.RUN
Sample: RFA-100,071194
Method: DHA050.MTH
Processed 445 Peaks
DETAILED HC ANALYSIS OF GASOLINE

Analyzed: 18-JUL-94 2:41 PM
Reported: 07-28-1994 09:44:52
DHA DBase File: RI_B-M85.DBF
Normalized to 100.00%

Composite Report
Totals by Group Type & Carbon Number
(in Weight Percent)

	Paraffins:	I-paraffins:	Aromatics:	Naphthenes:	Olefins:	Total:
C1:	0.000	0.000	0.000	0.000	0.000	0.000
C2:	0.000	0.000	0.000	0.000	0.000	0.000
C3:	0.001	0.000	0.000	0.000	0.000	0.001
C4:	4.226	0.079	0.000	0.000	0.063	4.368
C5:	2.843	9.474	0.000	0.178	3.041	15.536
C6:	2.253	9.095	1.774	1.260	2.748	17.130
C7:	1.087	6.420	9.231	1.582	2.300	20.620
C8:	0.595	7.274	12.174	1.346	0.264	21.653
C9:	0.182	1.928	8.045	0.627	0.114	10.895
C10:	0.117	0.810	4.499	0.172	0.016	5.613
C11:	0.061	0.297	1.035	0.053	0.016	1.463
C12:	0.038	0.275	0.527	0.000	0.004	0.845
C13:	0.032	0.010	0.000	0.000	0.000	0.042
Total	11.434	35.662	37.285	5.218	8.567	98.167

Oxygenates: 0.132 Total C14+: 0.434 Total Unknowns: 1.268
Grand Total: 100.000

DHA050R.DHA

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board
Southern Laboratory Branch / IAS

File: DHA050.RUN
Sample: RFA-100,071194
Method: DHA050.MTH
Processed 445 Peaks
DETAILED HC ANALYSIS OF GASOLINE

Analyzed: 18-JUL-94 2:41 PM
Reported: 07-28-1994 09:44:52
DHA DBase File: RI_B-M85.DBF
Normalized to 100.00%

Composite Report
Totals by Group Type & Carbon Number
(in Volume Percent)

	Paraffins:	I-paraffins:	Aromatics:	Naphthenes:	Olefins:	Total:
C1:	0.000	0.000	0.000	0.000	0.000	0.000
C2:	0.000	0.000	0.000	0.000	0.000	0.000
C3:	0.002	0.000	0.000	0.000	0.000	0.002
C4:	5.369	0.104	0.000	0.000	0.076	5.550
C5:	3.339	11.247	0.000	0.176	3.396	18.157
C6:	2.512	10.175	1.485	1.230	2.884	18.285
C7:	1.169	6.889	7.830	1.542	2.387	19.818
C8:	0.623	7.617	10.320	1.283	0.267	20.111
C9:	0.186	1.969	6.794	0.589	0.117	9.656
C10:	0.118	0.812	3.706	0.158	0.016	4.810
C11:	0.060	0.294	0.782	0.049	0.016	1.201
C12:	0.037	0.269	0.435	0.000	0.004	0.746
C13:	0.031	0.010	0.000	0.000	0.000	0.041
Total	13.447	39.386	31.353	5.026	9.164	98.376

Oxygenates: 0.131 Total C14+: 0.418 Total Unknowns: 1.075
Grand Total: 100.000

DHA050R.DHA

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board
Southern Laboratory Branch / IAS

File: DHA050.RUN
Sample: RFA-100,071194
Method: DHA050.MTH
Processed 445 Peaks
DETAILED HC ANALYSIS OF GASOLINE

Analyzed: 18-JUL-94 2:41 PM
Reported: 07-28-1994 09:44:52
DHA DBase File: RI_B-M85.DBF
Normalized to 100.00%

Composite Report
Totals by Group Type & Carbon Number
(in Mole Percent)

	Paraffins:	I-paraffins:	Aromatics:	Naphthenes:	Olefins:	Total:
C1:	0.000	0.000	0.000	0.000	0.000	0.000
C2:	0.000	0.000	0.000	0.000	0.000	0.000
C3:	0.003	0.000	0.000	0.000	0.000	0.003
C4:	6.825	0.127	0.000	0.000	0.106	7.058
C5:	3.699	12.326	0.000	0.238	4.078	20.341
C6:	2.454	9.907	2.132	1.406	3.079	18.978
C7:	1.019	6.014	9.404	1.512	2.203	20.152
C8:	0.489	5.978	10.764	1.126	0.218	18.575
C9:	0.133	1.411	6.283	0.466	0.084	8.378
C10:	0.077	0.534	3.193	0.115	0.010	3.929
C11:	0.037	0.179	0.670	0.032	0.010	0.927
C12:	0.021	0.152	0.305	0.000	0.002	0.480
C13:	0.016	0.005	0.000	0.000	0.000	0.021
Total	14.772	36.633	32.751	4.895	9.792	98.843

Oxygenates: 0.140 Total C14+: 0.205 Total Unknowns: 0.811
Grand Total: 100.000

Detailed Hydrocarbon Analysis (DHAX)
California Air Resources Board
Southern Laboratory Branch / IAS

File: DHA050.RUN Analyzed: 18-JUL-94 2:41 PM
Sample: RFA-100,071194 Reported: 07-28-1994 09:44:52
Method: DHA050.MTH DHA DBase File: RI_B-M85.DBF
Processed 445 Peaks Normalized to 100.00%

DETAILED HC ANALYSIS OF GASOLINE

Components Listed in Chromatographic Order

Component	Wt%	Vol%	Mol%
propane	0.001	0.002	0.003
i-butane	0.079	0.104	0.127
butene-1	0.003	0.004	0.006
isobutylene	0.004	0.005	0.006
n-butane	4.226	5.369	6.825
t-butene-2	0.024	0.029	0.039
2,2-dimethylpropane	0.041	0.052	0.054
c-butene-2	0.033	0.039	0.055
3-methylbutene-1	0.049	0.058	0.066
i-pentane	9.432	11.195	12.272
pentene-1	0.220	0.253	0.295
2-methylbutene-1	0.440	0.498	0.590
n-pentane	2.843	3.339	3.699
isoprene	0.010	0.011	0.014
t-pentene-2	0.702	0.797	0.940
3,3-dimethylbutene-1	0.009	0.010	0.012
c-pentene-2	0.392	0.439	0.524
2-methylbutene-2	1.053	1.169	1.409
1t,3-pentadiene	0.014	0.016	0.020
cyclopentadiene	0.006	0.006	0.008
2,2-dimethylbutane	0.577	0.654	0.629
cyclopentene	0.146	0.139	0.202
4-methylpentene-1	0.047	0.052	0.053
3-methylpentene-1	0.074	0.082	0.082
cyclopentane	0.178	0.176	0.238
2,3-dimethylbutane	1.358	1.509	1.479
methyl-t-butylether	0.132	0.131	0.140
2,3-dimethylbutene-1	0.047	0.050	0.052
2-methylpentane	4.485	5.050	4.886
4-methyl-t-pentene-2	0.148	0.162	0.165
3-methylpentane	2.675	2.962	2.914
2-methylpentene-1	0.240	0.258	0.268
hexene-1	0.129	0.140	0.143

n-hexane	2.253	2.512	2.454
t-hexene-3	0.189	0.204	0.211
c-hexene-3	0.063	0.068	0.071
t-hexene-2	0.372	0.400	0.415
2-methylpentene-2	0.492	0.524	0.549
3-methyl-c-pentene-2	0.244	0.257	0.272
3-methylcyclopentene	0.051	0.050	0.059
c-hexene-2	0.207	0.219	0.230
O14	0.001	0.002	0.002
3,3-dimethylpentene-1	0.382	0.400	0.365
3-methyl-t-pentene-2	0.004	0.004	0.004
2,2-dimethylpentane	0.084	0.091	0.078
methylcyclopentane	1.036	1.018	1.156
2,4-dimethylpentane	1.074	1.174	1.006
cyclic diolefin or triolefin	0.007	0.007	0.007
2,2,3-trimethylbutane	0.037	0.040	0.035
?	0.005	0.005	0.004
cyclic diolefin or triolefin	0.009	0.009	0.010
O17	0.005	0.005	0.005
3,4-dimethylpentene-1	0.013	0.014	0.012
4,4-dimethyl-c-pentene-2	0.025	0.026	0.024
2,4-dimethylpentene-1	0.021	0.022	0.020
1-methylcyclopentene	0.379	0.358	0.433
benzene	1.774	1.485	2.132
3-methylhexene-1	0.029	0.031	0.028
2-methyl-c-hexene-3	0.016	0.017	0.016
3,3-dimethylpentane	0.085	0.090	0.080
5-methylhexene-1	0.035	0.037	0.034
cyclohexane	0.224	0.211	0.250
2-methyl-t-hexene-3	0.064	0.068	0.062
2-ethyl-3-methylbutene-1	0.012	0.013	0.012
4-methylhexene-1	0.040	0.042	0.039
4-methyl-t/c-hexene-2	0.114	0.119	0.109
2-methylhexane	1.465	1.588	1.373
2,3-dimethylpentane	1.931	2.043	1.809
1,1-dimethylcyclopentane	0.033	0.032	0.031
cyclohexene	0.060	0.055	0.069
3-methylhexane	1.536	1.644	1.439
3,4-dimethyl-c-pentene-2	0.042	0.043	0.040
1c,3-dimethylcyclopentane	0.303	0.299	0.290
1t,3-dimethylcyclopentane	0.263	0.258	0.251
3-ethylpentane	0.207	0.218	0.194
1t,2-dimethylcyclopentane	0.195	0.191	0.187
2,2,4-trimethylpentane	2.705	2.875	2.223
2-ethylpentene-1	0.055	0.058	0.053
O25	0.003	0.003	0.002
3-methyl-c-hexene-3	0.071	0.073	0.068
t-heptene-3	0.268	0.281	0.256
n-heptane	1.087	1.169	1.019

3-methyl-c-hexene-2	0.300	0.310	0.287
3-methyl-t-hexene-3	0.107	0.113	0.102
t-heptene-2	0.136	0.142	0.130
3-ethylpentene-2	0.065	0.066	0.062
c-heptene-2	0.230	0.237	0.220
2,3-dimethylpentene-2	0.128	0.129	0.123
3-ethylcyclopentene	0.009	0.009	0.009
O29	0.017	0.017	0.016
1c,2-dimethylcyclopentane	0.164	0.165	0.157
methylcyclohexane	0.458	0.437	0.438
2,2-dimethylhexane	0.096	0.101	0.079
O35	0.012	0.012	0.011
O36	0.009	0.009	0.008
ethylcyclopentane	0.166	0.159	0.159
2,5-dimethylhexane	0.342	0.362	0.281
2,2,3-trimethylpentane	0.053	0.054	0.044
2,4-dimethylhexane	0.533	0.560	0.438
?	0.011	0.011	0.009
O37	0.003	0.003	0.003
1c,2t,4-trimethylcyclopentane	0.110	0.106	0.092
3,3-dimethylhexane	0.039	0.040	0.032
O38	0.007	0.007	0.007
?	0.007	0.007	0.007
?	0.018	0.018	0.017
1t,2c,3-trimethylcyclopentane	0.082	0.079	0.069
O39	0.006	0.006	0.006
2,3,4-trimethylpentane	0.797	0.815	0.655
I1	0.196	0.201	0.161
O40	0.060	0.060	0.058
2,3,3-trimethylpentane	0.426	0.432	0.350
toluene	9.231	7.830	9.404
O42	0.025	0.025	0.021
?	0.010	0.010	0.008
O43	0.029	0.029	0.024
2,3-dimethylhexane	0.405	0.419	0.333
2-methyl-3-ethylpentane	0.037	0.038	0.030
1,1,2-trimethylcyclopentane	0.038	0.036	0.032
O44	0.072	0.072	0.060
2-methylheptane	0.621	0.654	0.510
4-methylheptane	0.241	0.251	0.198
3-methyl-3-ethylpentane	0.056	0.058	0.046
3,4-dimethylhexane	0.053	0.054	0.044
1c,3-dimethylcyclohexane	0.084	0.081	0.071
3-methylheptane	0.620	0.646	0.509
1c,2t,3-trimethylcyclopentane	0.229	0.219	0.192
3-ethylhexane	0.054	0.056	0.044
1t,4-dimethylcyclohexane	0.053	0.051	0.045
?	0.008	0.008	0.007
1,3-octadiene	0.008	0.008	0.007

1,1-dimethylcyclohexane	0.009	0.009	0.008
2,2,5-trimethylhexane	0.332	0.345	0.243
3c-ethylmethylcyclopentane	0.126	0.121	0.105
2,6-dimethylheptene-1	0.015	0.016	0.011
3t-ethylmethylcyclopentane	0.079	0.076	0.066
2t-ethylmethylcyclopentane	0.066	0.063	0.055
1,1-methylethylcyclopentane	0.024	0.023	0.020
?	0.009	0.008	0.007
2,2,4-trimethylhexane	0.034	0.034	0.025
1t,2-dimethylcyclohexane	0.095	0.090	0.080
t-octene-4	0.048	0.049	0.040
1c,2c,3-trimethylcyclopentane	0.131	0.124	0.110
1t,3-dimethylcyclohexane	0.032	0.030	0.027
n-octane	0.595	0.623	0.489
octene-2	0.056	0.057	0.047
I2	0.096	0.097	0.070
i-propylcyclopentane	0.065	0.061	0.054
O52	0.009	0.009	0.007
O53	0.027	0.028	0.020
N1	0.010	0.010	0.009
2,2,3,4-tetramethylpentane	0.007	0.007	0.005
2,3,4-trimethylhexane	0.057	0.057	0.042
N2	0.032	0.030	0.026
?	0.012	0.011	0.010
N3	0.022	0.021	0.018
2,3,3-trimethylhexene-1	0.014	0.015	0.011
1c,2-dimethylcyclohexane	0.025	0.023	0.021
2,3,5-trimethylhexane	0.064	0.065	0.047
1,1,4-trimethylcyclohexane	0.124	0.118	0.092
N4	0.014	0.013	0.011
2,2,3-trimethylhexane	0.058	0.059	0.042
2,4-dimethylheptane	0.010	0.010	0.007
4,4-dimethylheptane	0.050	0.052	0.037
n-propylcyclopentane	0.008	0.008	0.007
2,5-dimethylheptane	0.136	0.139	0.099
3,3-dimethylheptane	0.032	0.032	0.023
3,5-dimethylheptane	0.014	0.014	0.010
2,6-dimethylheptane	0.025	0.026	0.018
1,1,3-trimethylcyclohexane	0.027	0.025	0.020
N8	0.010	0.009	0.008
ethylbenzene	2.679	2.272	2.368
1c,2t,4t-trimethylcyclohexane	0.062	0.059	0.046
I3	0.012	0.012	0.009
2-methyloctene-1	0.012	0.013	0.009
I4	0.010	0.010	0.008
1,3-dimethylbenzene	4.920	4.187	4.350
1,4-dimethylbenzene	2.088	1.783	1.846
2,3-dimethylheptane	0.061	0.062	0.045
3,4-dimethylheptane	0.031	0.031	0.023

3,4-dimethylheptane	0.020	0.020	0.015
N14	0.014	0.014	0.011
I5	0.049	0.049	0.036
4-ethylheptane	0.012	0.012	0.009
4-methyloctane	0.149	0.152	0.109
2-methyloctane	0.208	0.215	0.152
N15	0.017	0.016	0.013
1c,2t,3-trimethylcyclohexane	0.016	0.016	0.012
3-ethylheptane	0.049	0.050	0.036
3-methyloctane	0.228	0.233	0.167
1c,2t,4c-trimethylcyclohexane	0.018	0.017	0.014
1,1,2-trimethylcyclohexane	0.013	0.012	0.009
1,2-dimethylbenzene	2.487	2.078	2.199
?	0.013	0.011	0.012
I6	0.019	0.019	0.014
I7	0.039	0.040	0.029
N18	0.035	0.033	0.026
N19	0.037	0.035	0.028
nonene-1	0.034	0.032	0.025
I8	0.024	0.024	0.017
I9	0.076	0.076	0.055
i-butylcyclopentane	0.013	0.012	0.010
N21	0.042	0.040	0.031
N22	0.042	0.040	0.031
N23/c-nonene-2	0.011	0.010	0.008
t-nonene-3	0.029	0.031	0.022
I10	0.027	0.028	0.020
?	0.036	0.036	0.026
n-nonane	0.182	0.186	0.133
1,1-methylethylcyclohexane	0.037	0.034	0.027
?	0.019	0.018	0.014
N25	0.022	0.021	0.017
t-2,2,5,5-tetramethylhexene-3	0.011	0.011	0.007
i-propylbenzene	0.098	0.084	0.076
N27	0.043	0.040	0.032
i-propylcyclohexane	0.018	0.017	0.014
I12	0.031	0.031	0.020
2,4-dimethyloctane	0.046	0.046	0.030
N28	0.003	0.002	0.002
N29	0.008	0.007	0.006
2,6-dimethyloctane	0.040	0.040	0.026
2,5-dimethyloctane	0.049	0.050	0.033
n-butylcyclopentane	0.024	0.022	0.018
I13	0.026	0.026	0.017
N30	0.018	0.016	0.012
I14	0.009	0.009	0.006
3,3-dimethyloctane	0.058	0.058	0.038
N31	0.006	0.005	0.004
?	0.020	0.018	0.013

n-propylbenzene	0.543	0.463	0.424
?	0.017	0.015	0.013
3,6-dimethyloctane	0.018	0.018	0.012
3-methyl-5-ethylheptane	0.025	0.026	0.017
N32	0.014	0.013	0.010
1,3-methylethylbenzene	1.877	1.597	1.466
1,4-methylethylbenzene	0.808	0.690	0.631
?	0.006	0.005	0.005
N33	0.010	0.009	0.007
?	0.005	0.004	0.003
1,3,5-trimethylbenzene	0.944	0.803	0.738
I15	0.039	0.039	0.026
5-methylnonane	0.048	0.048	0.032
I17	0.089	0.088	0.059
1,2-methylethylbenzene	0.582	0.486	0.455
2-methylnonane	0.104	0.105	0.068
?	0.013	0.013	0.008
3-ethyloctane	0.019	0.019	0.013
N35	0.017	0.016	0.011
3-methylnonane	0.097	0.098	0.064
?	0.010	0.010	0.006
I18	0.027	0.027	0.018
I19	0.007	0.007	0.005
1,2,4-trimethylbenzene	2.692	2.261	2.103
I20	0.010	0.010	0.006
i-butylcyclohexane	0.025	0.023	0.017
I21	0.036	0.035	0.024
I22	0.010	0.010	0.007
I23	0.006	0.006	0.004
N37	0.012	0.011	0.008
?	0.006	0.006	0.004
decene-1	0.005	0.005	0.003
1t-methyl-2-n-propylcyclohexane	0.041	0.038	0.027
i-butylbenzene	0.050	0.043	0.035
I25	0.017	0.017	0.011
sec-butylbenzene	0.053	0.045	0.037
n-decane	0.117	0.118	0.077
I26	0.008	0.008	0.005
N38	0.022	0.020	0.015
1,2,3-trimethylbenzene	0.500	0.411	0.390
1,3-methyl-i-propylbenzene	0.055	0.047	0.038
1,4-methyl-i-propylbenzene	0.026	0.022	0.018
I27	0.006	0.006	0.004
I29	0.011	0.011	0.007
2-3-dihydroindene	0.284	0.217	0.226
sec-butylcyclohexane	0.007	0.006	0.005
?	0.024	0.021	0.016
I30	0.018	0.018	0.011
1,2-methyl-i-propylbenzene	0.033	0.027	0.023

?	0.007	0.006	0.005
N40	0.045	0.042	0.028
I32	0.016	0.015	0.010
?	0.008	0.007	0.005
1,3-diethylbenzene	0.190	0.162	0.133
1,3-methyl-n-propylbenzene	0.369	0.315	0.258
I33	0.018	0.018	0.011
1,4-methyl-n-propylbenzene	0.220	0.189	0.154
n-butylbenzene	0.099	0.085	0.070
1,3-dimethyl-5-ethylbenzene	0.379	0.316	0.265
1,2-diethylbenzene	0.033	0.028	0.023
N41	0.008	0.007	0.005
1,2-methyl-n-propylbenzene	0.124	0.104	0.087
I37	0.036	0.035	0.021
?	0.002	0.002	0.001
I38	0.033	0.032	0.020
1,4,dimethyl-2-ethylbenzene	0.237	0.199	0.166
1,3-dimethyl-4-ethylbenzene	0.297	0.254	0.208
I39	0.013	0.013	0.008
I40	0.118	0.118	0.071
1,2-dimethyl-4-ethylbenzene	0.422	0.355	0.295
?	0.003	0.003	0.002
I41	0.006	0.006	0.004
1,3-dimethyl-2-ethylbenzene	0.023	0.019	0.016
I42	0.008	0.008	0.005
I43	0.006	0.006	0.004
?	0.007	0.007	0.004
?	0.009	0.009	0.005
undecene-1	0.016	0.016	0.010
1,4-methyl-t-butylbenzene	0.029	0.025	0.018
1,2-dimethyl-3-ethylbenzene	0.103	0.085	0.072
?	0.004	0.004	0.003
?	0.006	0.005	0.004
?	0.004	0.004	0.003
1,2-ethyl-i-propylbenzene	0.008	0.007	0.005
?	0.008	0.007	0.005
n-undecane	0.061	0.060	0.037
1,4-ethyl-i-propylbenzene	0.008	0.006	0.005
1,2,4,5-tetramethylbenzene	0.223	0.184	0.156
1,2,3,5-tetramethylbenzene	0.302	0.250	0.211
?	0.004	0.004	0.003
?	0.045	0.038	0.032
?	0.015	0.013	0.011
?	0.006	0.005	0.004
?	0.015	0.012	0.010
1,2-methyl-t-butylbenzene	0.012	0.010	0.007
?	0.002	0.002	0.001
5-methylindan	0.252	0.208	0.179
I43	0.018	0.017	0.010

4-methylindan	0.062	0.051	0.044
1,2-ethyl-n-propylbenzene	0.086	0.071	0.055
2-methylindan	0.247	0.201	0.175
1,3-methyl-n-butylbenzene	0.020	0.017	0.013
1,3-di-i-propylbenzene	0.093	0.077	0.054
s-pentylbenzene	0.067	0.055	0.042
n-pentylbenzene	0.084	0.069	0.053
?	0.030	0.024	0.019
1,2-di-i-propylbenzene	0.035	0.029	0.020
?	0.040	0.033	0.023
?	0.003	0.003	0.002
?	0.043	0.036	0.025
1,4-di-i-propylbenzene	0.067	0.055	0.039
tetrahydronaphthalene	0.026	0.020	0.019
?	0.058	0.044	0.041
naphthalene	0.390	0.280	0.286
?	0.002	0.002	0.002
1,4-ethyl-t-butylbenzene	0.061	0.050	0.035
I45	0.095	0.093	0.052
I46	0.048	0.047	0.026
I47	0.060	0.059	0.033
I48	0.054	0.053	0.030
1,3-di-n-propylbenzene	0.063	0.052	0.036
A5	0.040	0.033	0.023
dodecene-1	0.004	0.004	0.002
?	0.006	0.006	0.003
A6	0.029	0.024	0.017
n-dodecane	0.038	0.037	0.021
?	0.005	0.005	0.003
?	0.017	0.017	0.009
?	0.018	0.018	0.010
1,3,5-triethylbenzene	0.007	0.006	0.004
?	0.011	0.010	0.007
?	0.054	0.044	0.031
?	0.004	0.003	0.002
?	0.043	0.035	0.025
?	0.054	0.044	0.031
?	0.020	0.017	0.012
1,2,4-triethylbenzene	0.015	0.012	0.009
?	0.016	0.014	0.009
?	0.019	0.016	0.011
?	0.021	0.018	0.012
1,4-methyl-n-pentylbenzene	0.089	0.073	0.051
?	0.035	0.029	0.021
?	0.007	0.006	0.004
?	0.009	0.007	0.005
?	0.018	0.015	0.010
n-hexylbenzene	0.028	0.023	0.016
?	0.004	0.004	0.003

?	0.092	0.076	0.053
?	0.039	0.032	0.023
?	0.014	0.011	0.008
?	0.010	0.008	0.006
?	0.004	0.003	0.002
?	0.038	0.032	0.022
?	0.023	0.019	0.013
I49	0.010	0.010	0.005
?	0.009	0.009	0.005
1,2,3,4,5-pentamethylbenzene	0.083	0.061	0.053
?	0.004	0.003	0.002
?	0.019	0.014	0.012
2-methylnaphthalene	0.444	0.320	0.291
?	0.030	0.022	0.020
?	0.024	0.017	0.016
?	0.004	0.003	0.003
?	0.010	0.007	0.007
?	0.016	0.012	0.010
1-methylnaphthalene	0.195	0.140	0.128
n-tridecane	0.032	0.031	0.016
C14+	0.011	0.011	0.005
C14+	0.007	0.007	0.003
C14+	0.024	0.023	0.011
C14+	0.017	0.016	0.008
C14+	0.017	0.017	0.008
C14+	0.005	0.005	0.002
C14+	0.015	0.015	0.007
C14+	0.013	0.012	0.006
C14+	0.014	0.013	0.007
C14+	0.002	0.002	0.001
C14+	0.021	0.021	0.010
C14+	0.004	0.004	0.002
C14+	0.006	0.006	0.003
C14+	0.005	0.005	0.002
C14+	0.009	0.009	0.004
C14+	0.004	0.004	0.002
C14+	0.004	0.004	0.002
C14+	0.012	0.011	0.005
C14+	0.002	0.002	0.001
C14+	0.009	0.009	0.004
C14+	0.011	0.011	0.005
C14+	0.007	0.007	0.003
C14+	0.007	0.007	0.004
C14+	0.007	0.007	0.004
C14+	0.006	0.006	0.003
C14+	0.004	0.004	0.002
C14+	0.015	0.015	0.007
C14+	0.007	0.007	0.003
C14+	0.003	0.003	0.001

C14+	0.008	0.008	0.004
C14+	0.002	0.002	0.001
C14+	0.020	0.020	0.010
C14+	0.009	0.009	0.004
C14+	0.007	0.006	0.003
C14+	0.018	0.017	0.008
C14+	0.018	0.017	0.008
C14+	0.009	0.009	0.004
C14+	0.032	0.031	0.015
C14+	0.015	0.014	0.007
C14+	0.007	0.007	0.003
C14+	0.002	0.001	0.001
C14+	0.003	0.003	0.001
C14+	0.003	0.003	0.001
C14+	0.002	0.002	0.001
C14+	0.003	0.003	0.001
C14+	0.002	0.002	0.001
C14+	0.001	0.001	0.001
C14+	0.002	0.002	0.001
C14+	0.001	0.001	0.001