ENTECH ENGINEERING INC.

P. O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

January 13, 2010

Mr. Sean O'Brien
Environmental Department
ConocoPhillips Company
Sweeny Refinery
Old Ocean, Texas 77463
P.O. Box 866
Sweeny, Texas 77480

SUBJECT: **TRANSMITTAL OF ENTECH ENGINEERING REPORT NO. ER2009-12-409 ENTITLED "CONOCOPHILLIPS COMPANY. SWEENY REFINERY UNIT 39.1 TAIL GAS INCINERATOR (EPN 39.1-95-118), INITIAL DEMONSTRATION OF COMPLIANCE TEST (TCEQ REGULATED ENTITY NUMBER: RN101619179; CUSTOMER REFERENCE NUMBER: CN601674351; ACCOUNT ID NO. BL-0042-G; PERMIT NO. 5920A AND PSD-TX-103M3)"**

Entech Engineering conducted an initial demonstration of compliance test on the Unit 39.1 Tail Gas Incinerator at the ConocoPhillips Company, Sweeny Refinery in Old Ocean, Texas. The test program was conducted on November 17 and 18, 2009 under ConocoPhillips Company Service Order No. SO4511980040.

Two copies and a CD of the Entech final report, which documents the findings and results of this program, are enclosed. Please note that the results presented in this report are only related to the items tested or the samples as received by Entech's lab; further, this report will not be reproduced, without the written approval of the client. Please contact us at our League City, Texas office if you have any questions or comments concerning the findings of this program.

Sincerely,

Joseph Muir
Senior Environmental Scientist

Reviewed by:

Jared Vawter
Environmental Scientist II

Approved by:

Edward J. Pasternak
Technical Manager

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CONOCOPHILLIPS COMPANY
SWEENY REFINERY
UNIT 39.1 TAIL GAS INCINERATOR (EPN 39.1-95-118)
INITIAL DEMONSTRATION OF COMPLIANCE TEST
(TCEQ REGULATED ENTITY NUMBER: RN101619179; CUSTOMER REFERENCE NUMBER: CN601674351; ACCOUNT ID. BL-0042-G; PERMIT 5920A AND PSD-TX-103M3)

(ENTECH REPORT NO. ER2009-12-409)

PREPARED BY

ENTECH ENGINEERING INC.
LEAGUE CITY, TEXAS

NOVEMBER 2009

PREPARED FOR

CONOCOPHILLIPS COMPANY
OLD OCEAN, BRAZORIA COUNTY, TEXAS

SAMPLING LOCATION

CONOCOPHILLIPS COMPANY
SWEENY REFINERY, UNIT 39.1 TAIL GAS INCINERATOR
OLD OCEAN, BRAZORIA COUNTY, TEXAS

ENTECH ENGINEERING INC.

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TABLE OF CONTENTS

APPENDICES

SECTION 1.0 SUMMARY

Entech Engineering Inc. was retained by ConocoPhillips Company to conduct an initial demonstration of compliance test on the Unit 39.1 Tail Gas Incinerator (TGI) at the Sweeny Refinery in Old Ocean, Brazoria County, Texas. The objective of this program was to demonstrate initial compliance of Unit 39.1 TGI Unit according to the Texas Commission on Environmental Quality (TCEQ) Permit No. 5920A and PSD-TX-103M3. The emission compliance test program was performed on November 17 and 18, 2009, and was coordinated by Mr. Sean O'Brien of ConocoPhillips Company. TCEQ was given notification of testing but no investigator was present to observe the compliance testing.

The Sweeny Refinery's Unit 39.1 TGI, which is designated in the permit as Emission Point Number (EPN) 39.1-95-118, is designed to control reduced sulfur in the tail gas of the sulfur recovery unit (SRU). The TGI fires either fuel gas or sweet natural gas as its primary fuel. According to the permit, the SRU TGI has to conduct an initial stack sampling to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere.[Special Condition 15]. Air contaminants emitted from TGI to be tested include volatile organic compound (VOC), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), and particulate matter less than or equal to ten microns (PM_{10}) emissions.

For the compliance test, Entech Engineering conducted three one-hour runs on particulate matter (PM) instead of PM_{10}, and NO_x, CO, VOC, SO_2 emissions, and three four-hour runs on H_2S emissions, with the unit operating at or near the maximum achievable capacity. Velocity, moisture, and flow were measured at the TGI stack to determine mass emission rates. Additionally, ConocoPhillips Company personal collected and analyzed fuel samples during the compliance test period for fuel composition.

A summary of the emission compliance test results is presented in Table 1. The results showed that the incinerator met all requirements under the TCEQ permit. Test methods and equipment descriptions are presented in Section 2.0 and results and discussion are presented in Section 3.0.

Table 1
ConocoPhillips Company
Sweeny Refinery
Old Ocean, Brazoria County, Texas
Unit 39.1 Tail Gas Incinerator (EPN 39.1-95-118)
Initial Demonstration of Compliance Test Summary
(TCEQ Regulated Entity Number: RN101619179; Customer Reference Number CN601674351; Account ID No. BL-0042-G; Permit 5920A and PSD-TX-103M3)

Pollutant	Pollutant Conc.			Allowable Permit	Allowable Exceeded (Yes/No)
	ppmv, dry	grains/DSCF	lb/hr	lb/hr	
CO	64.74	N/A	5.41	8.95	No
SO_2*	0.9	N/A	0.18	51.17	No
NO_X	13.85	N/A	1.90	2.37	No
VOC	1.08	N/A	0.14	0.24	No
PM	N/A	0.007	1.16	0.29	Yes
H_2S*	0.27	N/A	0.03	1.09	No

* - SO_2 and H_2S stack concentration were determined by the method detection limits.

SECTION 2.0 TEST METHOD AND EQUIPMENT DESCRIPTION

The emission test equipment, procedures, and analytical methods used in this program were those described in the Environmental Protection Agency (EPA) Code of Federal Regulations (CFR), Title 40 (Protection of the Environment), Part 60 (New Source Performance Standard), Appendix A. Sampling equipment was prepared and calibrated at the Entech Engineering facility prior to transportation. At the site, sampling equipment was set up, checked out, and employed according to the following Reference Method procedures.

EPA Reference Method 1- "*Sample and Velocity Traverses for Stationary Sources*". The TGI outlet is a circular stack with an internal diameter (ID) measuring 78 inches with two three-inch ports installed at 90° apart that conform to the requirements specified in the EPA Reference Method 1. Based on the sample port locations, Entech Engineering determined that a minimum of twelve traverse points was required to obtain representative emission samples. Each traverse point was sampled for five-minutes to obtain representative samples. Reference Method 1 procedures were also used to verify the absence of cyclonic flow; a schematic of the outlet sampling location is shown in Figure 1.

EPA Reference Method 2- "*Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*". Volumetric flow rate was determined by measuring the velocity using a Type S (Stausscheibe or reverse type) pitot tube with an assigned baseline coefficient of 0.84 and differential pressure gauge (inclined manometer).

EPA Reference Method 3A - "*Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Instrumental Analyzer Procedure)*". Excess oxygen (O_2) was measured by instrumental methods.

EPA Reference Method 3B - "*Gas Analysis for the Determination of Dry Molecular Weight*". Excess carbon dioxide (CO_2) concentrations were measured per Reference Method 3. Tedlar bag sample was collected using an evacuation tank and analyzed for CO_2 concentrations using an Orsat Gas Analyzer. The results were used to determine the stack gas molecular weight.

EPA Reference Method 4 - "*Determination of Moisture Content in Stack Gases*". Moisture content of the stack gas was measured by condensing flue gas moisture in Modified and Greenburg-Smith impingers immersed in an ice water bath and determining the moisture gain by gravimetric analysis. A schematic of the RM 4 sampling train is shown in Figure 3.

EPA Reference Method 5 - "*Determination of Particulate Emissions in Stationary Sources*". The Test includes both the front-half catch and the back-half catch as in required by the TCEQ.

EPA Reference Method 6C- *"Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)".*

EPA Reference Method 7E - *"Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure)".*

EPA Reference Method 10 - *"Determination of Carbon Monoxide Emissions From Stationary Sources".*

EPA Reference Method 15- *"Determination of Hydrogen Sulfide, Carbonyl Sulfide, and Carbon Disulfide Emissions From Stationary Sources".* Sulfide concentrations were determined using a Shimadzu gas chromatograph equipped with a flame photometric detector (GC/FPD). Sulfide calibrations were performed with a VICI Metronics Dynacalibrator using sulfide permeation tubes. Off-gas samples were conditioned with a particulate filter and SO_2 (citrate buffer) scrubber.

EPA Reference Method 18- *"Measurement of Gaseous Organic Compound Emissions by Gas Chromatography".* Integrated VOC samples were collected in Tedlar bags and analyzed for methane and ethane using gas chromatograph equipped with flame ionization detector (GC/FID). Methane and ethane measured in the samples were excluded from the VOCs measured by the THC.

Reference Method 25A- *"Determination of Total Gaseous Organic Concentrations Using a Flame Ionization Analyzer".* VOCs will be measured as propane equivalent.

In this test program, Continuous Emission Monitoring Systems (CEMS) were used to determine the gaseous concentrations of Nitrogen Oxides (NO_X), Sulfur Dioxide (SO_2), Carbon Monoxide (CO) and excess Oxygen (O_2). An Entech test trailer equipped with a sampling systems conforming to the Reference Method specifications was used for the test. A description of the Entech Engineering CEM systems is presented as follows:

Thermo Environmental Instruments, Inc. NO_X Analyzer-

Model No.	:	42C
Serial No.	:	42CHL-77922-387
Principal	:	Chemiluminescence
Calibration	:	High Span - 53.7 ppmv NO_x in N_2
		Mid Span - 24.6 ppmv NO_x in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 53.7 ppmv NO_X

Thermo Environmental Instruments, Inc. SO_2 Analyzer -

Model No.	:	43C High Level
Serial No.	:	410005567
Principal	:	Non-dispersive Ultraviolet
Calibration	:	High Span - 47.3 ppmv SO_2 in N_2
		Mid Span - 22.2 ppmv SO_2 in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 47.3.0 ppmv SO_2

California Analytical Instruments, Inc. $CO/CO_2/O_2$ Analyzer-

Model No.	:	300
Serial No.	:	1M08015
Principal	:	NDIR
Calibration	:	High Span - 297.0 ppmv CO in N_2
		Mid Span - 132.0 ppmv CO in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 297 ppmv CO
Calibration	:	High Span - 9.49 % O_2 in N_2
		Mid Span - 4.94 % O_2 in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 9.49 % O_2

J.U.M. Engineering, Inc. THC Analyzer (Stack) -

Model No.	:	VE 7
Serial No.	:	Entech #4 (9560390)
Principal	:	Flame ionization detector
Calibration	:	High Span - 88.4 ppmv propane in N_2
		Mid Span - 52.6ppmv propane in N_2
		Low Span - 31.0 ppmv propane in N_2
		Zero Span - N_2 Zero Gas
Full Span	:	0 - 100 ppmv THC

Sampling System ($NO_X/SO_2/CO/O_2$ CEMS) - A diaphragm pump was used to draw samples continuously from the sampling points through a heated probe and a heated Teflon® sample line. A condenser and a series of filters were used to condition the samples by removing moisture and particulate matter from the samples. Control valves and rotameters were used to regulate the conditioned gas flow to the instruments. All emission concentrations were measured on a dry-basis.

Instrument Calibration - Calibration gases for NO_X, SO_2, CO and O_2 were first sent directly to the instruments to check linearity of the instruments (Calibration Error Check). The calibration gases were then sent via a sample line to a three-way

valve located behind the sample probe and back to the instrument to verify system bias (System Bias Check). Procedures used in the system bias check were repeated after each test run to measure the instrument drift (Calibration Drift). The calibration gases for the NO_X, SO_2, CO and O_2 calibrations were EPA Protocol 1 gases.

Data Acquisition - A Yokogawa HR1300 hybrid recorder was used to record the CEMS output on a continuous basis. Final NO_X, SO_2, CO and O_2 readings were corrected for the system bias and instrument drift.

The Reference Methods 2, 3A, and 4 results were used to calculate the stack flow rates, which were then used to determine the pollutant mass emission rates in pounds-per-hour (lb/hr). Entech Engineering gaseous emission sampling configurations and schematic of the stack sampling location is presented in Figure 1. Reference Method 5 sampling equipment is presented in Figure 2.

Figure 1.
ConocoPhillips Company
Old Ocean, Texas
Unit 39.1 Tail Gas Incinerator (EPN 39.1-95-118)
(TCEQ Account No. BL-0042-G; Permit No. 5920A)
Gaseous Emission Sampling Configuration
(Drawing Not to Scale)

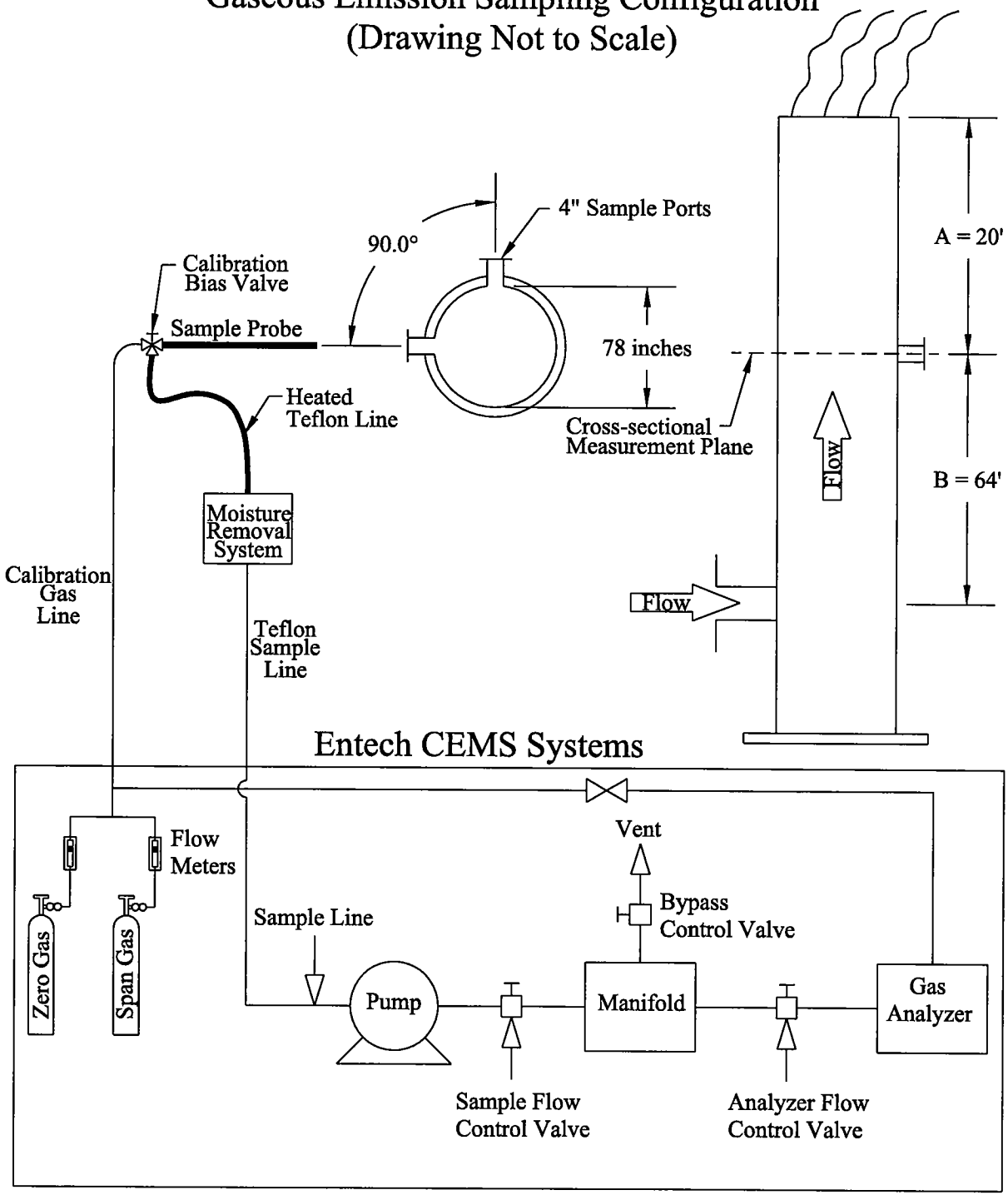
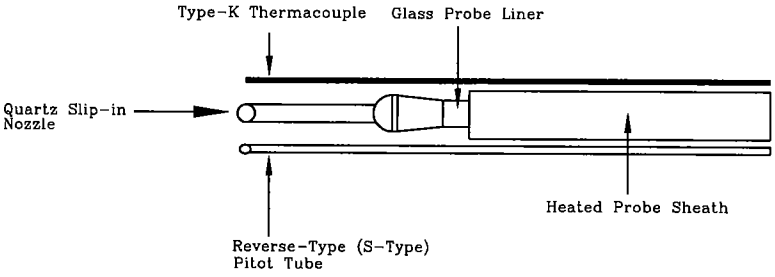
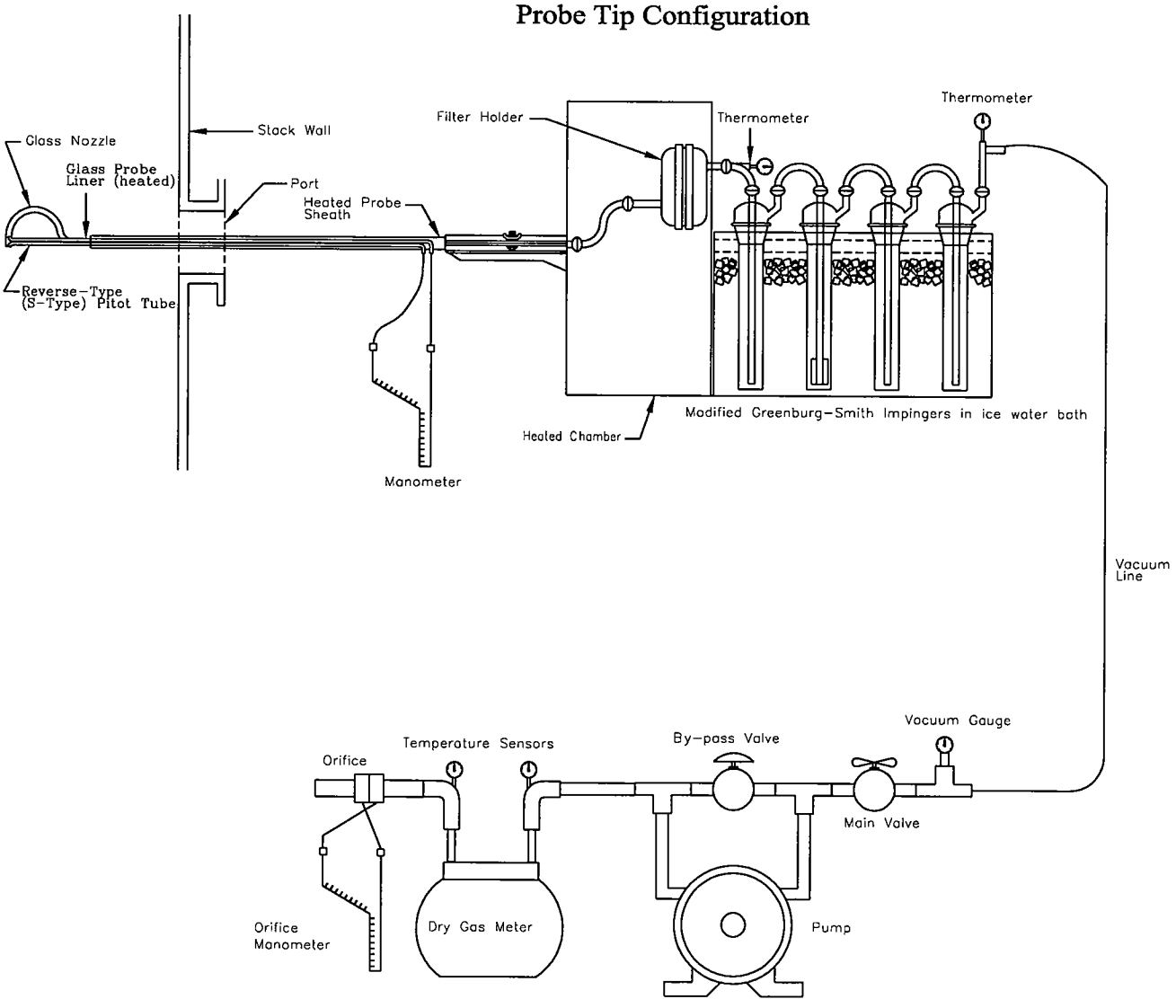


Figure 2
ConocoPhillips Company
Old Ocean, Texas
Unit 39.1 Tail Gas Incinerator (EPN 39.1-95-118)
(TCEQ Account No. BL-0042-G; Permit No. 5920A)
Reference Method 5 - Particulate Matter Sampling Train
(Drawing Not to Scale)



Probe Tip Configuration



SECTION 3.0 RESULTS AND DISCUSSIONS

Entech Engineering conducted an Initial Demonstration of compliance test on the Unit 39.1 Tail Gas Incinerator at the ConocoPhillips Company, Sweeny Refinery in Old Ocean, Brazoria County, Texas. The objective of the program was to determine initial demonstration of compliance of the incinerator according to TCEQ Permit 5920A and PSD-TX-103M3. The compliance test was conducted on November 17 and 18, 2009, with the unit operating at maximum achievable conditions.

During the compliance test, the NO_X emissions averaged 13.85 parts-per-million-by-volume-dry-basis (ppmvd) and 1.90 pounds-per-hour (lb/hr). SO_2 emissions averaged 0.9 ppmvd and 0.18 lb/hr. The CO emissions averaged 64.74 part-per-million-by-volume-dry-basis (ppmvd) and 5.41 pounds-per-hour (lb/hr). The VOC emissions averaged 1.08 part-per-million-by-volume-dry-basis (ppmvd) and 0.14 pounds-per-hour (lb/hr). The PM emissions averaged 0.007 grains-per-dry-standard-cubic-feet (grains/DSCF) and 1.16 pounds-per-hour (lb/hr). The H_2S emissions averaged 0.27 part-per-million-by-volume-dry-basis (ppmvd) and 0.03 pounds-per-hour (lb/hr).

Test results and selected test parameters for the incinerator are presented in Table 2. Stack VOC emission and particulate matter data summaries are presented in Table 3 and 4 respectively. All other pertinent data of the test program is contained in the appendices. The field raw data and laboratory analysis are contained in Appendices A and B. Example calculations and QA/QC data and instrument specifications are presented in Appendices C and D. Equipment calibrations, calibration gas certifications, process data, resumes, chain of custody, and personnel information are presented in Appendices E through J.

Table 2
ConocoPhillips Company, Sweeny Refinery
Old Ocean, Brazoria County, Texas
Unit 39.1 Tail Gas Incinerator (EPN 39.1-95-118)
Initial Demonstration of Compliance Test
(TCEQ Regulated Entity Number: RN101619179;
Customer Reference Number: CN601674351; Account ID No. BL-0042-G;
Permit No. 5920A and PSD-TX-103M3)

Test ID		Test 1	Test 2	Test 4	Average
Sampling Date		11/17/09	11/18/09	11/18/09	-
Sampling Time		15:10 - 16:10	11:15 - 12:15	13:15 - 14:15	-
Sampling Duration	Minutes	60	60	60	60
Operation Data					
Production Rate	Long Tons/day	NA	NA	NA	NA
Stack Data					
Oxygen (O_2)	vol%, dry	2.71	3.00	1.85	2.52
Carbon Dioxide (CO_2)	vol%, dry	4.30	4.43	4.47	4.40
Moisture	%	8.19	10.15	9.71	9.35
Stack Temperature	°F	547.5	548.7	546.3	547.5
Stack Gas Velocity	ft/sec	20.17	20.43	20.28	20.29
Volumetric Flow Rate	DSCFM	19326.95	19118.60	19116.66	19187.40
Emission Data					
Nitrogen Oxides (NO_X)	ppmv, dry	13.98	13.67	13.91	13.85
	lb/hr	1.94	1.87	1.90	1.90
Sulfur Dioxide (SO_2)	ppmv, dry	0.9	0.9	0.9	0.9
	lb/hr	0.18	0.18	0.18	0.18
Carbon Monoxide (CO)	ppmv, dry	55.49	60.14	78.60	64.74
	lb/hr	4.68	5.01	6.55	5.41
Volatile Organic Compound (VOC)	ppmv, dry	1.37	1.37	0.49	1.08
	lb/hr	0.18	0.18	0.06	0.14
Hydrogen Sulfide (H_2S)	ppmv, dry	0.27	0.27	0.27	0.27
	lb/hr	0.03	0.03	0.03	0.03
Particulate Matter	mg/DSCF	0.42	0.38	0.49	0.46
	grains/DSCF	0.006	0.006	0.008	0.007
	lb/hr	1.07	0.96	1.24	1.16

Note: Shaded areas represent minimum detectable limits.
NA - Not Available

Table 3. ConocoPhillips Company, Sweeny Refinery
Unit 39.1 Tail Gas Incinerator (EPN 39.1-95-118)
Stack VOC Emission Data Summary (Based on THC)

Test Parameters

Test ID	1	2	3	Average
Test Date	11/17/09	11/18/09	11/18/09	NA
Testing Period	15:10 - 16:10	11:15 - 12:15	13:15 - 14:15	NA

Duct or Stack Conditions

Oxygen (O2)	(vol%)	2.71	3.00	1.85	2.52
Carbon Dioxide, (CO2)	(vol%)	4.30	4.43	4.47	4.40
Flue Gas Temperature	(F)	547.50	548.70	546.30	547.50
Moisture Content	(vol%)	8.19	10.15	9.71	9.35
Velocity	(ft/sec)	20.17	20.43	20.28	20.29
Volumetric Flow Rate	(DSCF/min)	19326.95	19118.60	19116.66	19187.40

Emission Data

Methane (C1)	ppmv, dry	1.981	2.114	4.728	2.941
Methane as Propane	ppmv, dry	0.660	0.705	1.576	0.980
Ethane (C2)	ppmv, dry	0.220	0.220	0.220	0.220
Ethane as Propane	ppmv, dry	0.147	0.147	0.147	0.147
C1 & C2 as Propane	ppmv, dry	0.807	0.851	1.723	1.127

THC (including C1 & C2)	ppmv, wet	2.000	2.000	2.000	2.000
THC (including C1 & C2)	ppmv, dry	2.178	2.226	2.215	2.206
C1 & C2 as Propane	ppmv, dry	0.807	0.851	1.723	1.127
THC (excluding C1 & C2)*	ppmv, dry	1.371	1.375	0.492	1.079
THC (excluding C1 & C2)*	lb/hr	0.182	0.180	0.064	0.142

Note: Shaded areas represent minimum detectable limits.
* Note: Total Hydrocarbons reported as propane equivalent, excluding methane and ethane.

Table 4.
ConocoPhillips Company
Old Ocean, Texas
Unit 39.1 Tail Gas Incinerator (EPN 39.1-95-118)
Initial Demonstration of Compliance Test
Reference Method 5 Particulate Results

Sampling Location	Test ID	Front Half			Back Half	Total PM	Corrected Dry Gas Meter Volume	Particulate Matter Concentration	Particulate Matter Concentration
		Filter (mg)	Front Half Wash (mg)	Total (mg)	Back Half Rinse + Impinger 1 (mg)	(mg)	dscf	mg/dscf	grain/dscf
Stack	1	4.9	2.1	7.0	10.1	17.1	40.895	0.42	0.0065
	2	5.7	4.1	9.8	5.0	14.8	38.603	0.38	0.0059
	3	4.1	8.8	12.9	7.2	20.1	40.982	0.49	0.0076

APPENDICES

Appendix

A. FIELD "RAW" DATA

B. LABORATORY ANALYSIS

C. EXAMPLE CALCULATIONS AND QA/QC DATA

D. INSTRUMENT SPECIFICATIONS

E. EQUIPMENT CALIBRATIONS

F. CALIBRATION GAS CERTIFICATIONS

G. PROCESS DATA

H. RESUMES

I. CHAIN OF CUSTODY

J. PERSONNEL INFORMATION

APPENDIX A.

FIELD "RAW" DATA

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Determination of Minimum Number of Traverse Points
(40CFR60 Appendix A, Reference Method 1 or 1A)

By using the appropriate minimum number of traverse points figure in RM1 determine the number of traverse points recommended by both distance A and distance B, which have units of distance "stack duct diameters". This figure must be read vertically from either the top down, for distance A, or from bottom up, for distance B. The greater number of traverse points, as determined by each of the two distances will be the number of traverse points recommended for use. ***Sketch a drawing of the stack below with both distances A and B and duct diameter shown. Show both elevation and plane views. Place an "X" at location of sampling console (if applicable) and include its height with respect to grade.***

How distances are determined: measured / schematic (circle one) other _____

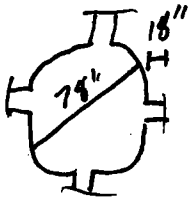
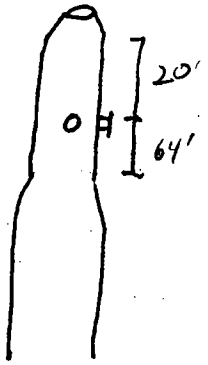
Distance A 20 feet / inches (circle one) Duct diameters 3.08

Recommended number of traverse points as determined by **Distance A** 12

Distance B 64 feet / inches (circle one) Duct diameters 9.85

Recommended number of traverse points as determined by **Distance B** 12

Stack diameter at port 78 feet / inches (circle one)

Plane View	Elevation View
 North Arrow	 North Arrow

Date: 11/17/09

Signature (Personnel): _____

Signature (Team Leader): _____

TO MAKE CORRECTION, USE SINGLE LINE, MARK THROUGH THE INCORRECT DATA, INITIAL, AND DATA
DO NOT USE PEN OR LIQUID PAPER TO COMPLETE COVER INCORRECT DATA.

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Traverse Point Layout for Circular Stacks

Stack ID at Port 78 feet / (inches) (circle one) Port Extension 16 feet / (inches) (circle one)

Traverse Point No.	Column A Length Factor K_L	Column B Traverse Points K_L x Stack ID	Column C Traverse Pt. + Reference (K_L x Stack ID) + Port Ext.
1	0.044	3.432	21.432
2	0.146	11.388	29.388
3	0.296	23.088	41.088
4	0.704	54.912	72.912
5	0.854	66.612	84.612
6	0.956	74.568	92.568
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Date: 11/17/09

AZ Signature:

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~~19.2~~ 19.2 20.1

Sampling Field Data Sheet

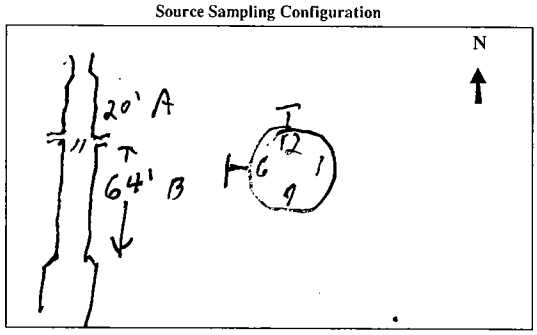
Plant:	ConocoPhillips	Barometer ID:	I 3	Probe ID:	G 7.5C
Location:	Sweeny	Barometric Pressure (in. Hg):	30.06	Thermocouple ID:	G7.5C (Thermometer / Thermocouple)
Unit:	39.1 / SRU	Static Pressure (in H_2O):	+.1	Post-Test Thermocouple Check:	G5 G5
Source/ EPN:		Ambient Temperature (°F):	65	Pitot Tube ID:	G-7.5C
Date:	11-17-09	Meter Pre Leak Check:	<.005 @ 15" Hg	PTCF:	.84
Test ID:	1	Meter Post Leak Check:	.005 @ 15" Hg	Pump ID:	1
Test Operator:	MBL	Pitot (+) Tube Leak Check:	✓ @ 3" H_2O	Meter ID:	1
Team Leader:	JM	Pitot (-) Tube Leak Check:	✓ @ 3" H_2O	DGMCF:	~~1.000~~ MB .006
		Nozzle ID:	~~.490~~ MB .410	ΔH Std:	1.99
		Filter ID:	1127	K factor:	22.9

Traverse Point	Clock Time	Dry Gas Meter Reading (ft^3)	ΔP (in H_2O)	Sq Rt ΔP (in H_2O)	ΔH (in H_2O)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Pump Vacuum (in Hg)	Probe Temperature (°F)	Filter Temperature (°F)	Impinger Exit Temperature (°F)	Stack Temperature (°F)
1	1510	677.729	.05	.224	1.14		67	2		230	55	540
2	1515	681.200	.06	.245	1.4		67	2		231	54	543
3	1520	684.400	.06	.245	1.4		67	2		240	52	551
4	1525	687.500	.07	.265	1.6		68	2		231	53	547
5	1530	690.800	.07	.265	1.6		68	2		228	54	547
6	1535	694.200	.05	.224	1.14		69	2		230	53	548
CP	1540	697.153										
7	1545	697.153	.06	.245	1.40		68	2		231	52	544
8	1551	700.200	.07	.265	1.60		68	2		232	51	547
9	1556	704.000	.08	.283	1.83		68	2		233	52	550
10	1601	707.400	.08	.283	1.83		68	2		234	53	548
11	1606	710.700	.08	.283	1.83		68	2		230	55	550
12	1611	714.000	.06	.245	1.40		65	2		231	54	549
end	1615	718.218										
				.256								
	Elapsed Time (min)	Gas Volume (ft^3)	Average ΔP	Average Sq Rt ΔP	Average ΔH	Average Meter Temperature						Average Stack Temp.

Source Measurements

Emission Point Height (ft):	200
Sampling Point Height (ft):	150
Stack Diameter (@ Exit):	<78"
Stack Diameter (@ Port):	78"
Port Length (in.):	18"
Port Size (in.):	4"

Source Sampling Configuration



.245

QA/QC Check

Completeness _____ Legibility _____ Reasonableness _____

Certified by: _____ Personnel (Signature/Date)

_____ Team Leader (Signature/Date)

A3

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sampling Field Data Sheet

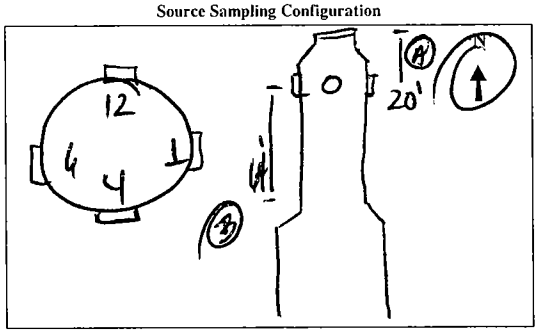
Plant:	Conoco Phillips	Barometer ID:	I3	Probe ID:	G7.5C
Location:	Sweeny	Barometric Pressure (in. Hg):	30.04	Thermocouple ID:	G7.5C (Thermometer ✓ / Thermocouple ✓)
Unit:	39.1 SRU	Static Pressure (in H_2O):	.10	Post-Test Thermocouple Check:	
Source/ EPN:	INCINERATOR	Ambient Temperature (°F):	70°F	Pitot Tube ID:	G7.5C
Date:	11.18.09	Meter Pre Leak Check:	.001@15" VAC	PTCF:	0.84
Test ID:	2	Meter Post Leak Check:	.001@15" VAC	Pump ID:	1
Test Operator:	GUS VARGAS	Pitot (+) Tube Leak Check:	3" H_2O @15 sec	Meter ID:	1
Team Leader:	JOE MUIR	Pitot (-) Tube Leak Check:	3" H_2O @15 sec	DGMCF:	1.006
		Nozzle ID:	~~.480~~ .470	ΔH Std:	1.89
		Filter ID:	1110	K factor:	22.9

Traverse Point	Clock Time (1115)	Dry Gas Meter Reading (ft³)	ΔP (in H_2O)	Sq Rt ΔP (in H_2O)	ΔH (in H_2O)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Pump Vacuum (in Hg)	Probe Temperature (°F)	Filter Temperature (°F)	Impinger Exit Temperature (°F)	Stack Temperature (°F)
-	0	718.05	-	-	-	-	-	-	-	-	-	-
1-1	5	721.535	.06	.283	1.83	77	70	5	250	250	47	549
2	10	724.890	.07	.265	1.60	80	70	6	251	253	48	551
3	15	728.310	.07	.265	1.60	82	71	6	252	254	50	550
4	20	731.735	.07	.265	1.60	83	72	6	254	256	50	550
5	25	734.634	.06	.245	1.14	83	72	6	255	256	51	550
6	30	737.960	.07	.265	1.60	83	72	6	256	257	52	550
1145 1150	PC	737.960	-	-	-	-	-	-	-	-	-	-
2-1	35	741.075	.07	.265	1.60	79	72	6	257	256	52	547
2	40	744.430	.07	.265	1.60	81	72	6	256	254	52	546
3	45	747.510	.06	.245	1.14	83	73	6	254	251	53	547
4	50	750.520	.06	.245	1.14	83	73	6	255	252	53	548
5	55	753.545	.06	.245	1.14	83	73	6	256	251	53	548
6	60	756.570	.06	.245	1.14	83	73	6	252	250	53	549
	60		-067	.258								548.75
	Elapsed Time (min)	Gas Volume (ft³)	Average ΔP	Average Sq Rt ΔP	Average ΔH	Average Meter Temperature						Average Stack Temp.

Source Measurements

Emission Point Height (ft):	200'
Sampling Point Height (ft):	150'
Stack Diameter (@ Exit):	<78"
Stack Diameter (@ Port):	78"
Port Length (in.):	15"
Port Size (in.):	4"

Source Sampling Configuration



QA/QC Check

Completeness _____ Legibility _____ Reasonableness _____

Certified by: _____ Personnel (Signature/Date) 11.18.09

_____ Team Leader (Signature/Date)

A4

20.17

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sampling Field Data Sheet

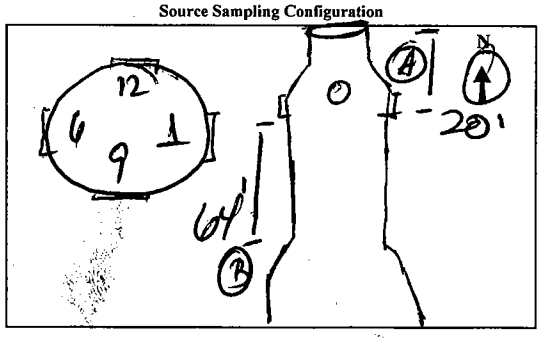
Plant:	Conoco Phillips	Barometer ID:	I3	Probe ID:	G 7.5C
Location:	Sweeny	Barometric Pressure (in. Hg):	30.04	Thermocouple ID:	G7.5C (Thermometer / Thermocouple)
Unit:	39.1 SRU	Static Pressure (in HO):	.10	Post-Test Thermocouple Check:	✓ / ✓
Source/ EPN:	1N	Ambient Temperature (F):	76°F	Pitot Tube ID:	G 7.5C
Date:	11.18.09	Meter Pre Leak Check:	.003 @ 15" VAC	PTCF:	0.84
Test ID:	3 Method #5	Meter Post Leak Check:	.001 @ 10" VAC	Pump ID:	1
Test Operator:	Gustavo Vargas	Pitot (+) Tube Leak Check:	3" H_2O @ 15 sec	Meter ID:	1
Team Leader:	Joe Muir	Pitot (-) Tube Leak Check:	3" H_2O @ 15 sec	DGMCF:	1.006
		Nozzle ID:	~~.480~~ MB .470	ΔH Std:	1.89
		Filter ID:	1144	K factor:	GV ~~0.84~~ MB 30.4

Traverse Point	1515 Clock Time	Dry Gas Meter Reading (ft³)	ΔP (in H_2O)	Sq Rt ΔP (in H_2O)	ΔH (in H_2O)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Pump Vacuum (in Hg)	Probe Temperature (°F)	Filter Temperature (°F)	Impinger Exit Temperature (°F)	Stack Temperature (°F)
—	0	756.930	—	—	—	—	—	—	—	—	—	—
1-1	5	760.6010	.07	.265	1.848	90	84	3	250	253	59	545
2	10	764.135	.06	.245	1.584	90	84	3	252	255	56	546
3	15	767.580	.06	.245	1.584	96	85	3	256	258	57	547
4	20	771.271	.07	.265	1.848	98	85	2	257	259	56	547
5	25	774.945	.07	.265	1.848	93	86	2	256	260	59	547
6	30	778.455	.07	.265	1.848	94	87	2	257	258	60	546
1545 PC	—	778.455	—	—	—	—	—	—	—	—	—	—
2-1	35	782.110	.06	.245	1.584	93	86	2	258	259	58	546
2	40	785.395	.07	.265	1.848	93	85	2	259	260	56	547
3	45	788.765	.06	.245	1.584	94	86	2	256	254	55	547
4	50	792.110	.07	.265	1.848	94	87	2	257	255	54	546
5	55	795.485	.06	.245	1.584	94	87	2	258	254	53	546
6	60	798.895	.07	.265	1.848	94	82	2	255	253	54	546
	60											
	Elapsed Time (min)	Gas Volume (ft³)	Average ΔP	Average Sq Rt ΔP	Average ΔH	Average Meter Temperature						Average Stack Temp.

Source Measurements

Emission Point Height (ft):	200'
Sampling Point Height (ft):	150'
Stack Diameter (@ Exit):	78"
Stack Diameter (@ Port):	78"
Port Length (in.):	18"
Port Size (in.):	4"

Source Sampling Configuration



QA/QC Check

Completeness _____ Legibility _____ Reasonableness _____

Certified by: _____ Personnel (Signature/Date) 11.18.09

A5

_____ Team Leader (Signature/Date)

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Impinger Catch

Client:	Conoco Phillips
Location:	Sweeny
Unit:	39.1
Sampling Location:	SRU Incinerator
Date:	11/17/09
Test No:	1
Balance ID:	TL-3

Impinger Number	Solution Used	Amount of Solution (ml)	Impinger Tip Configuration	Final Weight (g)	Initial Weight (g)	Weight Difference (g)	Final Visual Observation
1	H_2O	100	M	217.1	158.6	58.5	clear
2	H_2O	100	GS	170.5	156.5	14.0	clear
3	–	–	M				
4	Silica Gel		M	305.9	301.0	4.9	blue / pink
5							
6							
7							
8							

Total Weight Gain of Impingers (g) = ~~374~~ 77.4

Date: 11/17/09

Signature:

Independent Verification of Calculations

Explanation: Someone other than the person who performed the original work and associated calculations must verify that these calculations have been performed correctly.

Date: 1/12/10

Signature

Revision 1.1.1 10-28-04

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Impinger Catch

Client:	Grace Phillips
Location:	Sweeny
Unit:	39.1
Sampling Location:	SMV Exchanger
Date:	11/16/09
Test No:	2
Balance ID:	TL-3

Impinger Number	Solution Used	Amount of Solution (ml)	Impinger Tip Configuration	Final Weight (g)	Initial Weight (g)	Weight Difference (g)	Final Visual Observation
1	H_2O	100	M	228.4	156.2	72.2	
2	H_2O	100	GS	171.3	158.9	12.4	
3	—	—	M				
4	Sil Gel	—	M	343.7	335.8	7.9	
5							
6							
7							
8							

Total Weight Gain of Impingers (g) = 92.5

Date: 11-18-09

Signature:

Independent Verification of Calculations

Explanation: Someone other than the person who performed the original work and associated calculations must verify that these calculations have been performed correctly.

Date: 1/12/09

Signature

Revision 1.1.1 10-28-04

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Impinger Catch

Client:	Conoco Phillips
Location:	Sweeny
Unit:	39.1
Sampling Location:	Stack SRV Incinerator
Date:	11/18/09
Test No:	T-3
Balance ID:	TL-3

Impinger Number	Solution Used	Amount of Solution (ml)	Impinger Tip Configuration	Final Weight (g)	Initial Weight (g)	Weight Difference (g)	Final Visual Observation
1	H_2O	100	M	229.1	157.2	71.9	Clear
2	H_2O	100	bs	170.1	157.7	12.4	Clear
3	—	—	M				
4	Sil Gel	—	M	277.4	268.2	9.2	Blue/pink
5							
6							
7							
8							

Total Weight Gain of Impingers (g) = 93.5

Date: 11/18/09

Signature (Personnel): [signature]

Independent Verification of Calculations

Explanation: Someone other than the person who performed the original work and associated calculations must verify that these calculations have been performed correctly.

Date: 1/12/09

Signature (Team Leader) [signature]

TO MAKE CORRECTION, USE SINGLE LINE, MARK THROUGH THE INCORRECT DATA, INITIAL, AND DATA. (November 2004)
DO NOT USE PEN OR LIQUID PAPER TO COMPLETE COVER INCORRECT DATA. [\\Enteng\F\Templates\DataSheets\Ver.2\RM4\Refere~2.wpd]

ENTECH ENGINEERING INC.
P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Orsat Analysis Results

Client:	Conoco
Location:	Old Ocean TX
Unit:	39.1
Sampling Location:	Stack
Date:	11/17/09
Leak Check:	✓
Personnel:	JMG

Test No.	Run No.	CO_2 (%)	O_2+CO_2	O_2 (%)
T1	1	4.3		
	2	4.3		
	3	4.3		
	Average	4.3		

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2	O_2 (%)
T2	1	4.4		
	2	4.5		
	3	4.4		
	Average	4.43		

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2	O_2 (%)
T3	1	4.5		
	2	4.4		
	3	4.5		
	Average	4.47		

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

ENTECH ENGINEERING INC.

P. O. Box 880746 . Houston, Texas 77288-0746 . (281)332-3118

2009 RM 5 Particulate Beaker Tare Weights

Instuctions: Use black ink pens only. Do not obliterate data. If a reading is not used or incorrectly taken use a single line to cross out the data and initial the crossout. All other data should not be marked in any way signifying completion of that sample or for any other reason. A calibration check must be performed and recorded in the calibration check section on a daily basis for both the initial and final weights. Duplicate weights must agree to within 0.5 mg (4 decimal places).

Initial Weight

Beaker ID (EB09-)				2078	2079	2080	2081	2083	2084	2085	2086		
DATE	TIME	INITIAL	NUMBER										
1/12/10	0920	JMM	1	92.7036	99.1371	98.4559	101.1250	97.7793	100.1572	100.7440	100.1288		
1/13/10	1000	JMM	2	92.7048	99.1370	98.4557	101.1246	97.7798	100.1573	100.7444	100.1285		
			3										
			4										
			5										
			6										
			7										
			8										
			9										
			10										
Average (g)				92.7039	99.1371	98.4558	101.1248	97.7796	100.1573	100.7442			

Final Weight

Beaker ID (EB09-)				2078	2079	2080	2081	2083	2084	2085	2086		
DATE	TIME	INITIAL	NUMBER										
12/11/09	09:00	JMM	1	92.7103	99.1421	98.4660	101.1273	97.7842	100.1672	100.7548	100.1343		
12/14/09	09:00	JMM	2	92.7113	99.1385	98.4680	101.1325	97.7823	100.1622	100.7510	100.1360		
12/15/09	1500	MAB	3	92.7109	99.1393	98.4646	101.1282	97.7843	100.1611	100.7500	100.1492		
12/16/09	1514	MAB	4		99.1390	98.4668	101.1269	97.7847	100.1616	100.7529	100.1390		
12/18/09	1300	JMM	5			98.4695	101.1265			100.7475	100.1341		
12/23/09	0900	JMM	6			98.4660				100.7529	100.1391		
12/24/09	0900	JMM	7			98.4658				100.7531	100.1398		
			8										
			9										
			10										
Average (g)				92.7111	99.1392	98.4659	101.1267	97.7845	100.1614	100.7530			

A10

Total Weight Gain

Beaker ID (EB09-)	2078	2079	2080	2081	2083	2084	2085			
Difference (g)	0.0072	0.0021	0.0101	0.0019	0.0050	0.0041	0.0088			

Plant Name	ConocoPhillips	ConocoPhillips	ConocoPhillips	ConocoPhillips	ConocoPhillips	ConocoPhillips	ConocoPhillips			
Location	Old Ocean Tx	Old Ocean Tx	Old Ocean Tx	Old Ocean Tx	Old Ocean Tx	Old Ocean Tx	Old Ocean Tx			
Unit	Unit 39.1	Unit 39.1	Unit 39.1	Unit 39.1	Unit 39.1	Unit 39.1	Unit 39.1			
Sample ID	T3I/BHW	T1 FHW	T1I/BHW	D1 Blank	T2I/BHW	T2 FHW	T3 FHW			
Test Date	11/18/09	11/17/09	11/17/09	11/18/09	11/18/09	11/18/09	11/18/09			
Personnel Initials	JMM	JMM	JMM	JMM	JMM	JMM	JMM			

ENTECH ENGINEERING INC.

P. O. Box 890748 . Houston, Texas 77289-0748 . (281)332-3118

2009 RM 5 Particulate Filter Tare Weights

Instuctions: Use black ink pens only. Do not obliterate data. If a reading is not used or incorrectly taken use a single line to cross out the data and initial the crossout. All other data should not be marked in any way signifying completion of that sample or for any other reason. A calibration check must be performed and recorded in the calibration check section on a daily basis for both the init al and final weights. Duplicate weights must agree to within 0.5 mg (4 decimal places).

Initial Weight

Filter ID (EF09-)				1146	1145	1144	1143	1118	1110	1127	1141		
DATE	TIME	INITIAL	NUMBER										
11-13-09	08:00	JMA	1	0.8200	0.7771	0.7949	0.7904						
11-13-09	14:42	JMA	2	0.8207	0.7791	0.7977	0.7925						
11-16-09	08:00	JMA	3	0.8197	0.7779	0.7960	0.7911						
11-16-09	16:00	JMA	4	0.4193	0.7781	0.7963	0.7925	0.6511	0.6984	0.7457	0.6045		
11-17-09	0550	JMA	5				0.7941	0.6520	0.6991	0.7461	0.6045		
			6										
			7										
			8										
			9										
			10										
Average (g)						0.7962			0.6990	0.7459	0.6045		

Final Weight

Filter ID (EF09-)						1144			1110	1127	1141		
DATE	TIME	INITIAL	NUMBER										
12-11-09	0900	JMA	1			0.7974			0.6974	0.8001	0.6045		
12-14-09	0930	JMA	2			0.7961			0.6947	0.7960	0.6045		
12-15-09	1500	MAB	3			0.8002			0.7017	0.8007			
12-16-09	1515	MAB	4			0.8004			0.7049	0.8009			
12-18-09	1300	JMA	5						0.7044				
			6										
			7										
			8										
			9										
			10										
Average (g)						0.8003			0.7047	0.8005	0.6045		

Total Weight Gain

Filter ID (EF09-)				1144			1110	1127	1141		
Difference (g)				+0.0041			-0.0057	0.0046	0.0000		
Plant Name				Conesville			Conesville	Conesville	Conesville		
Location				Old Dam Test			Old Dam Test	Old Dam Test	Old Dam Test		
Unit				Unit 3&1			Unit 3&1	Unit 3&1	Unit 3&1		
Sample ID				Test 1			Test 2	Test 3	Blank		
Test Date				11/17/09			11/18/09	11/18/09	11/17/09		
Personnel Initials				JMA			JMA	JMA	JMA		

\Enteng\T\Templates\2005\par...\RM5 Filter TARE 2006 Rev 1.0.qpw

RESULTS

Run averages corrected for bias

Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

Run	O2 %	CO ppm	NOx ppm	THC ppm	SO2 ppm
1	2.7093	55.49	13.980	0.19	-0.575
2	3.0015	60.14	13.672	0.75	0.127
3	1.8526	78.60	13.906	1.95	0.095

A12

CALERR01

Calibration Error Test at Run 1 . STRATA Version 2.0

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts Volts
11-17-2009	11:29:33		1.3911	5.37	0.242	3.26	-0.628	1.3911	
0.0537 0.0242	0.326	-0.0628							
11-17-2009	11:30:33		-0.1232	5.37	0.079	3.29	0.107	-0.1232	
0.0537 0.0079	0.329	0.0107							
11-17-2009	11:31:33		-0.0528	5.88	0.081	3.19	-0.196	-0.0528	
0.0588 0.0081	0.319	-0.0196							
11-17-2009	11:32:33		-0.1557	5.54	0.145	3.19	-1.050	-0.1557	
0.0554 0.0145	0.319	-0.1050							
11-17-2009	11:33:32		-0.2159	3.81	0.278	3.21	-1.101	-0.2159	
0.0381 0.0278	0.321	-0.1101							
11-17-2009	11:34:33		-0.2506	4.59	0.277	3.15	-1.179	-0.2506	
0.0459 0.0277	0.315	-0.1179							
11-17-2009	11:35:32		-0.2092	4.49	0.276	3.27	-1.107	-0.2092	
0.0449 0.0276	0.327	-0.1107							
11-17-2009	11:36:33		1.4606	3.96	0.277	3.26	-1.022	1.4606	
0.0396 0.0277	0.326	-0.1022							
11-17-2009	11:37:32		4.9111	3.92	0.277	3.13	-1.062	4.9111	
0.0392 0.0277	0.313	-0.1062							
11-17-2009	11:38:33		5.0856	3.61	0.277	3.10	-1.018	5.0856	
0.0361 0.0277	0.310	-0.1018							
11-17-2009	11:39:33		-0.1744	4.23	0.113	3.15	-0.293	-0.1744	
0.0423 0.0113	0.315	-0.0293							
11-17-2009	11:40:33		-0.0516	4.68	0.080	18.23	-0.129	-0.0516	
0.0468 0.0080	1.823	-0.0129							
11-17-2009	11:41:33		-0.0057	4.75	0.079	2.15	-0.093	-0.0057	
0.0475 0.0079	0.215	-0.0093							
11-17-2009	11:42:32		0.0218	4.41	0.081	2.09	-0.166	0.0218	
0.0441 0.0081	0.209	-0.0166							
11-17-2009	11:43:33		0.0241	-0.33	0.082	1.21	-0.048	0.0241	
-0.0033 0.0082	0.121	-0.0048							
11-17-2009	11:44:32		0.0319	-0.23	0.082	0.05	-0.096	0.0319	
-0.0023 0.0082	0.005	-0.0096							
11-17-2009	11:45:33		0.0149	-1.05	0.037	0.03	-0.656	0.0149	
-0.0105 0.0037	0.003	-0.0656							
11-17-2009	11:46:32		3.8306	-0.36	11.237	31.70	17.425	3.8306	
-0.0036 1.1237	3.170	1.7425							
11-17-2009	11:47:33		4.8185	-0.62	13.685	85.12	21.650	4.8185	
-0.0062 1.3685	8.512	2.1650							
11-17-2009	11:48:33		4.8548	0.28	20.074	85.33	22.542	4.8548	
0.0028 2.0074	8.533	2.2542							
11-17-2009	11:49:33		4.8957	-0.23	25.478	85.49	22.308	4.8957	
-0.0023 2.5478	8.549	2.2308							
11-17-2009	11:50:33		4.9443	-0.13	24.728	88.32	22.158	4.9443	
-0.0013 2.4728	8.832	2.2158							
11-17-2009	11:51:32		4.9249	-0.30	20.939	88.35	20.174	4.9249	
-0.0030 2.0939	8.835	2.0174							
11-17-2009	11:52:33		9.5747	0.77	0.907	84.70	5.893	9.5747	
0.0077 0.0907	8.470	0.5893							
11-17-2009	11:53:32		9.3885	-0.09	44.630	53.60	40.296	9.3885	
-0.0009 4.4630	5.360	4.0296							
11-17-2009	11:54:33		9.4394	-0.04	54.091	53.19	44.876	9.4394	
-0.0004 5.4091	5.319	4.4876							
11-17-2009	11:55:32		9.4687	-0.05	54.131	52.77	47.259	9.4687	
-0.0005 5.4131	5.277	4.7259							
11-17-2009	11:56:33		9.4806	0.05	54.131	52.76	48.189	9.4806	
0.0005 5.4131	5.276	4.8190							
11-17-2009	11:57:33		8.3187	29.52	42.451	52.74	19.408	8.3187	
0.2952 4.2451	5.274	1.9408							

A13

CALERR01

11-17-2009 11:58:33 -0.0390 128.18 0.842 39.40 0.034 -0.0390
1.2818 0.0842 3.940 0.0034
11-17-2009 11:59:33 -0.0448 130.67 0.476 30.90 -0.836 -0.0448
1.3067 0.0476 3.090 -0.0836
11-17-2009 12:00:32 1.2487 247.34 0.396 30.83 -0.799 1.2487
2.4734 0.0396 3.083 -0.0799
11-17-2009 12:01:33 -0.0692 303.53 0.422 30.54 -1.114 -0.0692
3.0353 0.0422 3.054 -0.1114
11-17-2009 12:02:32 -0.0271 297.02 0.371 10.31 -1.165 -0.0271
2.9702 0.0371 1.031 -0.1165

Calibration Error Test at Run 1
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	Reference Cylinder Numbers			
	Zero	Low-range	Mid-range	High-range
O2	N2	cc9824	cc55212	
CO	N2	ALM014290	cc111686	
NOx	N2	cc161053	cc241846	cc61285
THC	AIR	cc161053	cc236179	cc151954
SO2	N2	cc204173	cc144163	cc57866

Date/Time	11-17-2009		12:02:42		PASSED
Analyte	O2	CO	NOx	THC	SO2
Units	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0.0000	0.00	0.000	0.00	0.000
Zero Avg	0.0277	-0.33	0.082	0.07	-0.051
Zero Error%	0.3	0.1	0.2	0.1	0.1
Low Ref Cyl				31.00	
Low Avg			30.93		
Low Error%				0.1	
Mid Ref Cyl	4.9400	132.00	24.600	52.60	22.200
Mid Avg	4.9458	130.54	24.745	52.76	22.167
Mid Error%	0.1	0.5	0.3	0.2	0.1
High Ref Cyl	9.4900	297.00	53.700	88.40	47.300
High Avg	9.4831	297.09	54.116	88.45	48.223
High Error%	0.1	0.0	0.8	0.0	2.0

A14

IBIAS01

Initial System Bias Check for Run 1 . STRATA Version 2.0

		O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
		%	ppm	ppm	ppm	ppm	Volts	Volts	Volts		
11-17-2009	12:03:47	10.6242	39.34	1.057	2.53	-0.997	10.6242	0.3934	0.1057	0.253	-0.0997
11-17-2009	12:04:47	0.2923	-2.23	0.658	8.58	-0.555	0.2923	-0.0223	0.0658	0.858	-0.0555
11-17-2009	12:05:47	0.0976	-0.89	0.426	0.71	-0.154	0.0976	-0.0089	0.0426	0.071	-0.0154
11-17-2009	12:06:47	0.1104	-1.07	0.377	0.08	-0.084	0.1104	-0.0107	0.0377	0.008	-0.0084
11-17-2009	12:07:46	4.4406	-1.12	0.379	3.16	-0.577	4.4406	-0.0112	0.0379	0.316	-0.0577
11-17-2009	12:08:47	4.9161	-2.20	0.380	52.02	-0.784	4.9161	-0.0220	0.0380	5.202	-0.0784
11-17-2009	12:09:46	5.0379	0.29	0.294	52.29	-0.672	5.0379	0.0029	0.0294	5.229	-0.0672
11-17-2009	12:10:47	0.7344	116.66	0.340	52.23	-0.558	0.7344	1.1666	0.0340	5.223	-0.0558
11-17-2009	12:11:46	0.0905	131.58	0.272	9.73	-0.162	0.0905	1.3158	0.0272	0.973	-0.0162
11-17-2009	12:12:47	0.1108	120.28	0.248	2.10	-0.340	0.1108	1.2028	0.0248	0.210	-0.0340
11-17-2009	12:13:47	0.0825	-0.17	18.095	1.48	0.370	0.0825	-0.0017	1.8095	0.148	0.0370
11-17-2009	12:14:47	0.0880	-2.07	24.364	1.32	0.674	0.0880	-0.0207	2.4364	0.132	0.0674
11-17-2009	12:15:47	0.1332	-1.98	21.980	1.20	0.329	0.1332	-0.0198	2.1980	0.120	0.0329
11-17-2009	12:16:46	0.0903	-2.40	0.362	1.15	-0.299	0.0903	-0.0240	0.0362	0.115	-0.0299
11-17-2009	12:17:47	0.1012	-1.88	0.415	1.02	-0.241	0.1012	-0.0188	0.0415	0.102	-0.0241
11-17-2009	12:18:46	0.1054	-1.95	0.628	0.98	0.202	0.1054	-0.0195	0.0628	0.098	0.0202
11-17-2009	12:19:47	0.1076	-1.74	0.798	1.13	1.449	0.1076	-0.0174	0.0798	0.113	0.1449
11-17-2009	12:20:46	0.1123	-2.36	0.927	0.95	2.918	0.1123	-0.0236	0.0927	0.095	0.2918
11-17-2009	12:21:47	0.1193	-2.31	0.973	1.03	4.229	0.1193	-0.0231	0.0973	0.103	0.4229
11-17-2009	12:22:46	0.1382	-2.27	0.973	0.91	5.694	0.1382	-0.0227	0.0973	0.091	0.5694
11-17-2009	12:23:47	0.2391	-2.82	1.238	0.99	20.505	0.2391	-0.0282	0.1238	0.099	2.0505

Initial System Bias Check for Run 1

Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	Reference Cylinder Numbers	
	Zero	Span
O2	N2	cc9824
CO	N2	ALM014290
NOx	N2	cc241846
THC	AIR	cc236179
SO2	N2	cc144163

Date/Time 11-17-2009 12:24:25 PASSED

Analyte	O2	CO	NOx	THC	SO2
Units	%	ppm	ppm	ppm	ppm

A15

				IBIAS01	
Zero Ref Cyl	0.0000	0.00	0.000	0.00	0.000
Zero Cal	0.0277	-0.33	0.082	0.07	-0.051
Zero Avg	0.0898	-0.89	0.406	0.15	-0.073
Zero Bias%	0.7	0.2	0.6	0.1	0.0
Zero Drift%					
Span Ref Cyl	4.9400	132.00	24.600	52.60	22.200
Span Cal	4.9458	130.54	24.745	52.76	22.167
Span Avg	4.9272	132.07	24.342	52.13	22.905
Span Bias%	0.2	0.5	0.8	0.6	1.6
Span Drift%					

A16

RUN01

Test Run 1 Begin. STRATA Version 2.0
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts		
11-17-2009	12:25:26	0.2513	-3.88	1.047	1.01	15.399	0.2513	-0.0388	0.1047	0.101
11-17-2009	12:26:26	8.0024*	-1.11	1.065	0.85	1.299	8.0024*	-0.0111	0.1065	0.085
11-17-2009	12:27:26	13.1815*		-0.04	0.660	0.85	-1.112	13.1815*		-0.0004
11-17-2009	12:28:26	13.1815*		2.16	0.478	0.83	-1.396	13.1815*		0.0216
11-17-2009	12:29:25	13.1815*		2.28	0.477	0.90	-1.598	13.1815*		0.0228
11-17-2009	12:30:26	13.1815*		3.00	0.476	0.93	-1.394	13.1815*		0.0300
11-17-2009	12:31:25	13.1815*		3.17	0.477	0.93	-1.466	13.1815*		0.0317
11-17-2009	12:32:26	13.1815*		3.39	0.476	0.88	-1.490	13.1815*		0.0339
11-17-2009	12:33:25	13.1815*		3.70	0.476	0.89	-1.625	13.1815*		0.0370
11-17-2009	12:34:26	13.1815*		4.10	0.477	0.89	-1.681	13.1815*		0.0410
11-17-2009	12:35:26	13.1815*		0.70	0.709	0.95	-1.362	13.1815*		0.0070
11-17-2009	12:36:26	13.1815*		-2.32	1.175	0.88	-0.614	13.1815*		-0.0232
11-17-2009	12:37:26	13.1815*		-2.74	1.171	0.90	-1.066	13.1815*		-0.0274
11-17-2009	12:38:25	13.1815*		-2.89	1.072	0.81	-1.118	13.1815*		-0.0289
11-17-2009	12:39:26	13.1815*		-2.65	1.053	0.83	-1.331	13.1815*		-0.0265
11-17-2009	12:40:25	13.1815*		-1.45	0.883	0.80	-1.493	13.1815*		-0.0145
11-17-2009	12:41:26	13.1815*		-0.36	0.505	0.78	-1.360	13.1815*		-0.0036
11-17-2009	12:42:25	13.1815*		-0.37	0.475	0.79	-1.306	13.1815*		-0.0037
11-17-2009	12:43:26	13.1815*		-0.39	0.405	0.80	-1.551	13.1815*		-0.0039
11-17-2009	12:44:25	8.1696*	24.86	3.770	0.87	-1.398	8.1696*	0.2486	0.3770	0.087
11-17-2009	12:45:26	2.9224	45.89	12.739	0.99	-0.697	2.9224	0.4589	1.2739	0.099
11-17-2009	12:46:26	2.8922	33.34	13.510	1.02	-0.625	2.8922	0.3334	1.3510	0.102
11-17-2009	12:47:25	2.8336	49.05	13.114	0.93	-0.731	2.8336	0.4905	1.3114	0.093
11-17-2009	12:48:26	2.8575	42.32	12.814	0.74	-0.759	2.8575	0.4232	1.2814	0.074
11-17-2009	12:49:25	2.8532	44.32	12.713	0.75	-0.621	2.8532	0.4432	1.2713	0.075
11-17-2009	12:50:26	2.8351	58.57	12.639	0.72	-0.695	2.8351	0.5857	1.2639	0.072
11-17-2009	12:51:25	2.6814	66.41	12.718	1.02	-0.596	2.6814	0.6641	1.2718	0.102
11-17-2009	12:52:26	2.7118	53.30	13.048	0.94	-0.670	2.7118			

A17

0.5330 1.3048	0.094 -0.0670						
11-17-2009	12:53:26	2.7293	44.92	12.704	0.98	-0.702	2.7293
0.4492 1.2704	0.098 -0.0702						
11-17-2009	12:54:26	2.6486	39.88	12.811	0.69	-1.088	2.6486
0.3988 1.2811	0.069 -0.1088						
11-17-2009	12:55:26	2.7882	43.37	13.194	0.62	-0.750	2.7882
0.4337 1.3194	0.062 -0.0750						
11-17-2009	12:56:25	2.5390	45.81	14.246	0.89	-0.933	2.5390
0.4581 1.4246	0.089 -0.0933						
11-17-2009	12:57:26	2.4873	33.10	13.627	0.49	-0.761	2.4873
0.3310 1.3627	0.049 -0.0761						
11-17-2009	12:58:25	3.2573	29.47	10.240	0.38	-1.429	3.2573
0.2947 1.0240	0.038 -0.1429						
11-17-2009	12:59:26	2.7140	41.08	13.416	0.53	-0.806	2.7140
0.4108 1.3416	0.053 -0.0806						
11-17-2009	13:00:25	2.6138	37.83	13.300	0.50	-0.854	2.6138
0.3783 1.3300	0.050 -0.0854						
11-17-2009	13:01:26	2.6294	35.72	13.123	0.53	-0.669	2.6294
0.3572 1.3123	0.053 -0.0669						
11-17-2009	13:02:25	2.6360	35.32	13.324	0.46	-0.837	2.6360
0.3532 1.3324	0.046 -0.0837						
11-17-2009	13:03:26	2.5258	45.85	13.392	0.57	-0.742	2.5258
0.4585 1.3392	0.057 -0.0742						
11-17-2009	13:04:26	2.5567	35.01	13.335	0.63	-0.763	2.5567
0.3501 1.3335	0.063 -0.0763						
11-17-2009	13:05:25	2.6276	40.25	13.345	0.39	-0.766	2.6276
0.4025 1.3345	0.039 -0.0766						
11-17-2009	13:06:26	2.5351	45.45	13.407	0.65	-0.744	2.5351
0.4545 1.3407	0.065 -0.0744						
11-17-2009	13:07:25	2.3626	58.38	13.517	0.66	-0.750	2.3626
0.5838 1.3517	0.066 -0.0750						
11-17-2009	13:08:26	2.4715	41.51	13.907	0.59	-0.758	2.4715
0.4151 1.3907	0.059 -0.0758						
11-17-2009	13:09:25	2.4642	46.10	13.716	0.81	-0.677	2.4642
0.4610 1.3716	0.081 -0.0677						
11-17-2009	13:10:26	2.4330	54.60	13.608	0.50	-0.742	2.4330
0.5460 1.3608	0.050 -0.0742						
11-17-2009	13:11:25	2.4499	44.43	13.703	0.73	-0.635	2.4499
0.4443 1.3703	0.073 -0.0635						
11-17-2009	13:12:26	2.4885	34.36	13.922	0.59	-0.779	2.4885
0.3436 1.3922	0.059 -0.0779						
11-17-2009	13:13:26	4.9087*	38.46	13.526	0.49	-0.741	4.9087*
0.3846 1.3526	0.049 -0.0741						
11-17-2009	13:14:25	9.4339*	25.95	4.893	0.66	-1.380	9.4339*
0.2595 0.4893	0.066 -0.1380						
11-17-2009	13:15:26	2.8879	51.96	13.238	0.78	-0.991	2.8879
0.5196 1.3238	0.078 -0.0991						
11-17-2009	13:16:25	2.9744	48.63	12.936	0.73	-0.937	2.9744
0.4863 1.2936	0.073 -0.0937						
11-17-2009	13:17:26	4.5754	44.97	7.223	0.64	-1.526	4.5754
0.4497 0.7223	0.064 -0.1526						
11-17-2009	13:18:25	6.2539	43.11	6.643	1.29	-1.680	6.2539
0.4311 0.6643	0.129 -0.1680						
11-17-2009	13:19:26	7.2831	43.79	6.528	0.57	-1.607	7.2831
0.4379 0.6528	0.057 -0.1607						
11-17-2009	13:20:25	7.8909	42.15	6.661	0.54	-1.514	7.8909
0.4215 0.6661	0.054 -0.1514						
11-17-2009	13:21:26	8.2304	40.24	6.581	0.69	-1.688	8.2304
0.4024 0.6581	0.069 -0.1688						
11-17-2009	13:22:26	8.4587	38.02	6.564	0.25	-1.475	8.4587
0.3802 0.6564	0.025 -0.1475						
11-17-2009	13:23:26	8.5990	34.13	6.438	0.24	-1.651	8.5990
0.3413 0.6438	0.024 -0.1651						

11-17-2009	13:24:26	8.7396	30.80	6.541	0.42	-1.537	8.7396
0.3080 0.6541	0.042 -0.1537						
11-17-2009	13:25:25	8.8355	30.31	6.480	0.43	-1.601	8.8355
0.3031 0.6480	0.043 -0.1601						
11-17-2009	13:26:26	8.8763	32.55	6.724	0.69	-1.618	8.8763
0.3255 0.6724	0.069 -0.1618						
11-17-2009	13:27:25	8.8710	35.78	6.656	0.79	-1.679	8.8710
0.3578 0.6656	0.079 -0.1679						
11-17-2009	13:28:26	8.8623	37.74	6.639	0.75	-1.691	8.8623
0.3774 0.6639	0.075 -0.1691						
11-17-2009	13:29:25	8.8566	40.23	6.819	0.73	-1.615	8.8566
0.4023 0.6819	0.073 -0.1615						
11-17-2009	13:30:26	8.8579	40.94	6.653	0.67	-1.634	8.8579
0.4094 0.6653	0.067 -0.1634						
11-17-2009	13:31:26	8.8620	40.99	6.606	0.64	-1.665	8.8620
0.4099 0.6606	0.064 -0.1665						
11-17-2009	13:32:26	8.8351	42.50	6.683	0.80	-1.617	8.8351
0.4250 0.6683	0.080 -0.1617						
11-17-2009	13:33:26	8.8171	41.64	6.728	0.40	-1.789	8.8171
0.4164 0.6728	0.040 -0.1789						
11-17-2009	13:34:25	8.8279	38.94	6.519	0.34	-1.678	8.8279
0.3894 0.6519	0.034 -0.1678						
11-17-2009	13:35:26	8.8615	36.59	6.451	0.74	-1.646	8.8615
0.3659 0.6451	0.074 -0.1646						
11-17-2009	13:36:25	8.8757	34.92	6.308	0.35	-1.737	8.8757
0.3492 0.6308	0.035 -0.1737						
11-17-2009	13:37:26	8.8839	35.92	6.265	0.29	-1.674	8.8839
0.3592 0.6265	0.029 -0.1674						
11-17-2009	13:38:25	8.8974	33.33	6.087	0.66	-1.713	8.8974
0.3333 0.6087	0.066 -0.1713						
11-17-2009	13:39:26	8.8944	35.24	6.168	0.28	-1.740	8.8944
0.3524 0.6168	0.028 -0.1740						
11-17-2009	13:40:26	8.9039	34.64	6.147	0.52	-1.754	8.9039
0.3464 0.6147	0.052 -0.1754						
11-17-2009	13:41:26	8.9012	34.60	5.945	0.54	-1.702	8.9012
0.3460 0.5945	0.054 -0.1702						
11-17-2009	13:42:26	8.9088	35.02	5.988	0.41	-1.703	8.9088
0.3502 0.5988	0.041 -0.1703						
11-17-2009	13:43:25	8.9318	35.57	6.074	0.44	-1.749	8.9318
0.3557 0.6074	0.044 -0.1749						
11-17-2009	13:44:26	8.9342	33.98	6.314	0.43	-1.802	8.9342
0.3398 0.6314	0.043 -0.1802						
11-17-2009	13:45:25	8.9355	33.25	6.161	0.64	-1.756	8.9355
0.3325 0.6161	0.064 -0.1756						
11-17-2009	13:46:26	8.9354	33.94	6.255	0.63	-1.758	8.9354
0.3394 0.6255	0.063 -0.1758						
11-17-2009	13:47:25	8.9115	36.41	6.462	0.64	-1.800	8.9115
0.3641 0.6462	0.064 -0.1800						
11-17-2009	13:48:26	8.8484	38.56	6.556	0.59	-1.830	8.8484
0.3856 0.6556	0.059 -0.1830						
11-17-2009	13:49:26	8.7896	40.22	6.676	1.05	-1.804	8.7896
0.4022 0.6676	0.105 -0.1804						
11-17-2009	13:50:26	8.7455	41.43	6.533	0.73	-1.752	8.7455
0.4143 0.6533	0.073 -0.1752						
11-17-2009	13:51:26	8.7282	41.67	6.630	0.64	-1.754	8.7282
0.4167 0.6630	0.064 -0.1754						
11-17-2009	13:52:25	8.7147	39.16	6.547	0.25	-1.788	8.7147
0.3916 0.6547	0.025 -0.1788						
11-17-2009	13:53:26	8.7474	35.84	6.573	0.53	-1.804	8.7474
0.3584 0.6573	0.053 -0.1804						
11-17-2009	13:54:25	8.7694	35.29	6.539	0.76	-1.771	8.7694
0.3529 0.6539	0.076 -0.1771						
11-17-2009	13:55:26	8.7385	37.29	6.711	0.50	-1.806	8.7385

0.3729 0.6711	0.050 -0.1806						
11-17-2009	13:56:25	8.7192	37.55	6.544	0.56	-1.618	8.7192
0.3755 0.6544	0.056 -0.1618						
11-17-2009	13:57:26	8.7657	35.69	6.152	0.47	-1.790	8.7657
0.3569 0.6152	0.047 -0.1790						
11-17-2009	13:58:25	8.7916	34.85	5.748	0.80	-1.816	8.7916
0.3485 0.5748	0.080 -0.1816						
11-17-2009	13:59:26	8.8056	36.51	5.367	0.67	-1.816	8.8056
0.3651 0.5367	0.067 -0.1816						
11-17-2009	14:00:26	8.7741	39.17	5.711	0.67	-1.578	8.7741
0.3917 0.5711	0.067 -0.1578						
11-17-2009	14:01:25	8.7309	40.42	5.863	0.34	-1.730	8.7309
0.4042 0.5863	0.034 -0.1730						
11-17-2009	14:02:26	8.7192	38.34	5.844	0.42	-1.661	8.7192
0.3834 0.5844	0.042 -0.1661						
11-17-2009	14:03:25	8.7681	35.80	5.758	0.48	-1.766	8.7681
0.3580 0.5758	0.048 -0.1766						
11-17-2009	14:04:26	8.7824	35.92	5.814	0.78	-1.772	8.7824
0.3592 0.5814	0.078 -0.1772						
11-17-2009	14:05:25	8.7446	38.34	6.106	0.81	-1.675	8.7446
0.3834 0.6106	0.081 -0.1675						
11-17-2009	14:06:26	8.6786	39.00	6.009	0.53	-1.655	8.6786
0.3900 0.6009	0.053 -0.1655						
11-17-2009	14:07:25	8.6393	36.98	5.782	0.43	-1.768	8.6393
0.3698 0.5782	0.043 -0.1768						
11-17-2009	14:08:26	8.6509	34.15	5.638	0.29	-1.641	8.6509
0.3415 0.5638	0.029 -0.1641						
11-17-2009	14:09:26	8.6802	30.91	5.779	0.66	-1.736	8.6802
0.3091 0.5779	0.066 -0.1736						
11-17-2009	14:10:26	8.6782	34.22	5.702	0.95	-1.672	8.6782
0.3422 0.5702	0.095 -0.1672						
11-17-2009	14:11:26	8.6441	38.61	5.947	0.65	-1.689	8.6441
0.3861 0.5947	0.065 -0.1689						
11-17-2009	14:12:25	8.6212	40.46	6.129	0.42	-1.700	8.6212
0.4046 0.6129	0.042 -0.1700						
11-17-2009	14:13:26	8.6292	38.87	5.885	0.57	-1.725	8.6292
0.3887 0.5885	0.057 -0.1725						
11-17-2009	14:14:25	8.6723	36.83	5.612	0.44	-1.786	8.6723
0.3683 0.5612	0.044 -0.1786						
11-17-2009	14:15:26	8.6811	35.29	5.886	0.45	-1.660	8.6811
0.3529 0.5886	0.045 -0.1660						
11-17-2009	14:16:25	8.7020	35.47	5.928	0.48	-1.791	8.7020
0.3547 0.5928	0.048 -0.1791						
11-17-2009	14:17:26	8.7230	35.74	5.922	0.39	-1.822	8.7230
0.3574 0.5922	0.039 -0.1822						
11-17-2009	14:18:26	8.6977	35.00	6.087	0.62	-1.684	8.6977
0.3500 0.6087	0.062 -0.1684						
11-17-2009	14:19:26	8.6724	34.92	6.039	0.66	-1.689	8.6724
0.3492 0.6039	0.066 -0.1689						
11-17-2009	14:20:26	8.6562	37.76	6.076	0.79	-1.642	8.6562
0.3776 0.6076	0.079 -0.1642						
11-17-2009	14:21:25	8.6085	40.75	6.094	0.44	-1.706	8.6085
0.4075 0.6094	0.044 -0.1706						
11-17-2009	14:22:26	8.5726	40.11	5.986	0.86	-1.723	8.5726
0.4011 0.5986	0.086 -0.1723						
11-17-2009	14:23:25	8.5506	38.79	6.030	0.40	-1.806	8.5506
0.3879 0.6030	0.040 -0.1806						
11-17-2009	14:24:26	8.5452	38.79	6.047	0.49	-1.738	8.5452
0.3879 0.6047	0.049 -0.1738						
11-17-2009	14:25:25	8.5612	37.71	6.029	0.50	-1.856	8.5612
0.3771 0.6029	0.050 -0.1856						
11-17-2009	14:26:26	5.2971	45.22	8.131	0.45	-1.509	5.2971
0.4522 0.8131	0.045 -0.1509						

A20

11-17-2009	14:27:26	2.7972	51.29	13.403	0.63	-1.220	2.7972
0.5129 1.3403	0.063 -0.1220						
11-17-2009	14:28:26	2.9410	52.82	13.040	0.63	-1.077	2.9410
0.5282 1.3040	0.063 -0.1077						
11-17-2009	14:29:26	3.0188	50.65	12.795	1.01	-1.142	3.0188
0.5065 1.2795	0.101 -0.1142						
11-17-2009	14:30:25	2.9845	48.48	13.137	0.53	-1.041	2.9845
0.4848 1.3137	0.053 -0.1041						
11-17-2009	14:31:26	3.0382	57.57	13.110	0.70	-1.093	3.0382
0.5757 1.3110	0.070 -0.1093						
11-17-2009	14:32:25	3.0316	45.76	13.300	0.68	-1.056	3.0316
0.4576 1.3300	0.068 -0.1056						
11-17-2009	14:33:26	3.2211	47.01	13.116	0.59	-1.125	3.2211
0.4701 1.3116	0.059 -0.1125						
11-17-2009	14:34:25	3.2523	37.76	13.127	0.58	-1.057	3.2523
0.3776 1.3127	0.058 -0.1057						
11-17-2009	14:35:26	3.2122	25.99	13.425	0.18	-1.056	3.2122
0.2599 1.3425	0.018 -0.1056						
11-17-2009	14:36:26	3.1561	40.39	13.296	0.20	-1.006	3.1561
0.4039 1.3296	0.020 -0.1006						
11-17-2009	14:37:26	3.2082	34.99	13.365	0.26	-1.063	3.2082
0.3499 1.3365	0.026 -0.1063						
11-17-2009	14:38:26	3.2004	35.66	13.422	0.29	-1.137	3.2004
0.3566 1.3422	0.029 -0.1137						
11-17-2009	14:39:25	3.1317	62.63	13.285	0.61	-0.958	3.1317
0.6263 1.3285	0.061 -0.0958						
11-17-2009	14:40:26	3.0542	52.61	13.546	0.61	-1.059	3.0542
0.5261 1.3546	0.061 -0.1059						
11-17-2009	14:41:25	3.0218	36.34	13.419	0.64	-1.088	3.0218
0.3634 1.3419	0.064 -0.1088						
11-17-2009	14:42:26	3.1602	49.67	13.247	0.22	-1.140	3.1602
0.4967 1.3247	0.022 -0.1140						
11-17-2009	14:43:25	3.0895	66.72	13.258	0.60	-1.054	3.0895
0.6672 1.3258	0.060 -0.1054						
11-17-2009	14:44:26	2.9870	67.42	13.485	0.96	-0.912	2.9870
0.6742 1.3485	0.096 -0.0912						
11-17-2009	14:45:25	2.9371	59.55	13.688	0.99	-0.935	2.9371
0.5955 1.3688	0.099 -0.0935						
11-17-2009	14:46:26	2.8811	50.81	13.920	0.87	-1.169	2.8811
0.5081 1.3920	0.087 -0.1169						
11-17-2009	14:47:26	2.9746	30.62	13.785	0.32	-0.918	2.9746
0.3062 1.3785	0.032 -0.0918						
11-17-2009	14:48:26	3.0212	43.32	13.613	0.29	-0.989	3.0212
0.4332 1.3613	0.029 -0.0989						
11-17-2009	14:49:26	2.9886	42.45	13.481	0.52	-1.036	2.9886
0.4245 1.3481	0.052 -0.1036						
11-17-2009	14:50:25	2.9759	35.06	13.691	0.43	-0.957	2.9759
0.3506 1.3691	0.043 -0.0957						
11-17-2009	14:51:26	2.8402	49.89	13.677	0.51	-0.843	2.8402
0.4989 1.3677	0.051 -0.0843						
11-17-2009	14:52:26	2.7001	53.48	13.884	0.50	-0.967	2.7001
0.5348 1.3884	0.050 -0.0967						
11-17-2009	14:53:25	2.6675	56.73	14.046	0.61	-0.959	2.6675
0.5673 1.4046	0.061 -0.0959						
11-17-2009	14:54:26	2.6465	57.20	13.991	0.82	-0.930	2.6465
0.5720 1.3991	0.082 -0.0930						
11-17-2009	14:55:26	2.6691	59.22	13.948	0.84	-0.934	2.6691
0.5922 1.3948	0.084 -0.0934						
11-17-2009	14:56:25	2.7446	45.61	14.144	0.72	-1.066	2.7446
0.4561 1.4144	0.072 -0.1066						
11-17-2009	14:57:26	2.7372	60.34	13.866	0.72	-0.955	2.7372
0.6034 1.3866	0.072 -0.0955						
11-17-2009	14:58:25	2.7986	66.21	13.832	0.86	-0.994	2.7986

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0.6621 1.3832 0.086 -0.0994
11-17-2009 14:59:26 2.8924 49.49 13.909 0.66 -1.015 2.8924
0.4949 1.3909 0.066 -0.1015
11-17-2009 15:00:25 2.9270 52.66 13.808 0.52 -0.926 2.9270
0.5266 1.3808 0.052 -0.0926
11-17-2009 15:01:26 2.9868 44.04 13.879 0.46 -1.101 2.9868
0.4404 1.3879 0.046 -0.1101
11-17-2009 15:02:25 2.9675 45.84 13.762 0.39 -1.048 2.9675
0.4584 1.3762 0.039 -0.1048
11-17-2009 15:03:26 2.8689 47.88 14.055 0.55 -0.983 2.8689
0.4788 1.4055 0.055 -0.0983
11-17-2009 15:04:26 2.7953 53.99 14.094 0.99 -0.959 2.7953
0.5399 1.4094 0.099 -0.0959
11-17-2009 15:05:26 2.7464 54.81 13.944 0.42 -0.932 2.7464
0.5481 1.3944 0.042 -0.0932
11-17-2009 15:06:26 2.6527 48.03 14.228 0.65 -0.972 2.6527
0.4803 1.4228 0.065 -0.0972
11-17-2009 15:07:26 2.6132 66.21 13.961 0.84 -0.895 2.6132
0.6621 1.3961 0.084 -0.0895
11-17-2009 15:08:26 2.6434 50.28 14.145 0.80 -1.008 2.6434
0.5028 1.4145 0.080 -0.1008
11-17-2009 15:09:25 2.6817 50.84 14.111 0.67 -0.817 2.6817
0.5084 1.4111 0.067 -0.0817
Begin calculating run averages
11-17-2009 15:11:03 2.6925 61.89 14.024 0.84 -0.965 2.6925
0.6189 1.4024 0.084 -0.0965
11-17-2009 15:12:04 2.6182 60.10 14.164 0.95 -0.743 2.6182
0.6010 1.4164 0.095 -0.0743
11-17-2009 15:13:03 2.7972 43.61 13.864 0.60 -0.857 2.7972
0.4361 1.3864 0.060 -0.0857
11-17-2009 15:14:04 2.8341 43.08 13.718 0.37 -0.972 2.8341
0.4308 1.3718 0.037 -0.0972
11-17-2009 15:15:03 2.7612 50.16 13.757 0.39 -0.923 2.7612
0.5016 1.3757 0.039 -0.0923
11-17-2009 15:16:04 2.8170 44.31 13.620 0.42 -0.843 2.8170
0.4431 1.3620 0.042 -0.0843
11-17-2009 15:17:03 2.7703 46.18 13.578 0.46 -0.907 2.7703
0.4618 1.3578 0.046 -0.0907
11-17-2009 15:18:04 2.8424 62.83 13.531 0.44 -0.921 2.8424
0.6283 1.3531 0.044 -0.0921
11-17-2009 15:19:03 2.8752 72.98 13.519 0.47 -0.996 2.8752
0.7298 1.3519 0.047 -0.0996
11-17-2009 15:20:03 2.7872 82.17 13.417 1.41 -0.894 2.7872
0.8217 1.3417 0.141 -0.0894
11-17-2009 15:21:04 2.6773 72.72 13.624 0.78 -0.888 2.6773
0.7272 1.3624 0.078 -0.0888
11-17-2009 15:22:03 2.7407 54.37 13.604 0.91 -0.876 2.7407
0.5437 1.3604 0.091 -0.0876
11-17-2009 15:23:04 2.8237 48.57 13.580 0.39 -0.907 2.8237
0.4857 1.3580 0.039 -0.0907
11-17-2009 15:24:03 2.8393 57.72 13.444 0.39 -0.923 2.8393
0.5772 1.3444 0.039 -0.0923
11-17-2009 15:25:04 2.8808 69.43 13.479 0.57 -0.904 2.8808
0.6943 1.3479 0.057 -0.0904
11-17-2009 15:26:03 2.9290 61.45 13.395 0.60 -0.770 2.9290
0.6145 1.3395 0.060 -0.0770
11-17-2009 15:27:03 2.9269 84.15 13.411 0.46 -0.792 2.9269
0.8415 1.3411 0.046 -0.0792
11-17-2009 15:28:03 2.8405 66.82 13.789 0.60 -0.809 2.8405
0.6682 1.3789 0.060 -0.0809
11-17-2009 15:29:03 2.7310 76.77 13.834 1.13 -0.759 2.7310
0.7677 1.3834 0.113 -0.0759
11-17-2009 15:30:04 2.8599 50.56 13.967 0.70 -0.735 2.8599

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0.5056 1.3967	0.070 -0.0735						
11-17-2009	15:31:03	2.9722	63.39	13.733	0.39	-0.694	2.9722
0.6339 1.3733	0.039 -0.0694						
11-17-2009	15:32:04	2.9891	59.86	13.714	0.51	-0.746	2.9891
0.5986 1.3714	0.051 -0.0746						
11-17-2009	15:33:03	2.9560	54.26	13.856	0.42	-0.790	2.9560
0.5426 1.3856	0.042 -0.0790						
11-17-2009	15:34:04	3.0272	71.47	13.703	0.55	-0.718	3.0272
0.7147 1.3703	0.055 -0.0718						
11-17-2009	15:35:03	3.0341	52.73	13.692	0.55	-0.786	3.0341
0.5273 1.3692	0.055 -0.0786						
11-17-2009	15:36:04	2.9820	41.32	13.860	0.23	-0.765	2.9820
0.4132 1.3860	0.023 -0.0765						
11-17-2009	15:37:03	2.9928	48.94	13.809	0.25	-0.772	2.9928
0.4894 1.3809	0.025 -0.0772						
11-17-2009	15:38:03	2.9275	42.28	14.077	0.43	-0.795	2.9275
0.4228 1.4077	0.043 -0.0795						
11-17-2009	15:39:04	2.9912	38.74	13.912	0.18	-0.756	2.9912
0.3874 1.3912	0.018 -0.0756						
11-17-2009	15:40:03	2.9706	43.78	13.907	0.38	-0.710	2.9706
0.4378 1.3907	0.038 -0.0710						
11-17-2009	15:41:04	2.8338	57.71	13.732	0.33	-0.741	2.8338
0.5771 1.3732	0.033 -0.0741						
11-17-2009	15:42:03	2.7960	53.29	14.010	0.68	-0.782	2.7960
0.5329 1.4010	0.068 -0.0782						
11-17-2009	15:43:04	2.7147	46.06	14.255	0.60	-0.760	2.7147
0.4606 1.4255	0.060 -0.0760						
11-17-2009	15:44:03	2.7075	37.23	14.192	0.54	-0.733	2.7075
0.3723 1.4192	0.054 -0.0733						
11-17-2009	15:45:04	2.8684	39.86	13.919	0.24	-0.576	2.8684
0.3986 1.3919	0.024 -0.0576						
11-17-2009	15:46:03	2.8729	57.99	13.841	0.39	-0.631	2.8729
0.5799 1.3841	0.039 -0.0631						
11-17-2009	15:47:03	2.7629	58.53	13.894	0.81	-0.630	2.7629
0.5853 1.3894	0.081 -0.0630						
11-17-2009	15:48:04	2.7441	50.28	14.210	0.60	-0.704	2.7441
0.5028 1.4210	0.060 -0.0704						
11-17-2009	15:49:03	2.6808	51.22	14.144	0.96	-0.771	2.6808
0.5122 1.4144	0.096 -0.0771						
11-17-2009	15:50:04	2.7717	37.98	14.058	0.79	-0.543	2.7717
0.3798 1.4058	0.079 -0.0543						
11-17-2009	15:51:03	2.8861	47.50	13.928	0.48	-0.741	2.8861
0.4750 1.3928	0.048 -0.0741						
11-17-2009	15:52:04	2.7817	64.42	13.762	0.68	-0.810	2.7817
0.6442 1.3762	0.068 -0.0810						
11-17-2009	15:53:03	2.7275	62.03	13.944	0.99	-0.741	2.7275
0.6203 1.3944	0.099 -0.0741						
11-17-2009	15:54:04	2.6598	51.39	13.949	0.73	-0.670	2.6598
0.5139 1.3949	0.073 -0.0670						
11-17-2009	15:55:03	2.7109	75.44	13.877	0.91	-0.612	2.7109
0.7544 1.3877	0.091 -0.0612						
11-17-2009	15:56:03	2.6757	76.87	14.082	1.25	-0.734	2.6757
0.7687 1.4082	0.125 -0.0734						
11-17-2009	15:57:04	2.6753	62.67	14.030	1.07	-0.700	2.6753
0.6267 1.4030	0.107 -0.0700						
11-17-2009	15:58:03	2.6952	70.42	14.093	0.89	-0.694	2.6952
0.7042 1.4093	0.089 -0.0694						
11-17-2009	15:59:04	2.6926	57.59	14.222	0.92	-0.662	2.6926
0.5759 1.4222	0.092 -0.0662						
11-17-2009	16:00:03	2.6392	74.13	13.995	1.30	-0.681	2.6392
0.7413 1.3995	0.130 -0.0681						
11-17-2009	16:01:04	2.6820	49.08	14.044	1.05	-0.708	2.6820
0.4908 1.4044	0.105 -0.0708						

AZ5

RUN01

11-17-2009	16:02:03		2.7687	61.32	14.077	0.81	-0.772	2.7687	
0.6132	1.4077	0.081	-0.0772						
11-17-2009	16:03:04		2.6367	63.07	14.047	0.94	-0.707	2.6367	
0.6307	1.4047	0.094	-0.0707						
11-17-2009	16:04:03		2.6416	47.30	14.090	1.05	-0.456	2.6416	
0.4730	1.4090	0.105	-0.0456						
11-17-2009	16:05:03		2.7495	41.25	14.090	0.62	-0.604	2.7495	
0.4125	1.4090	0.062	-0.0604						
11-17-2009	16:06:03		2.8438	50.23	13.695	0.49	-0.630	2.8438	
0.5023	1.3695	0.049	-0.0630						
11-17-2009	16:07:03		2.8537	63.42	13.579	0.81	-0.666	2.8537	
0.6342	1.3579	0.081	-0.0666						
11-17-2009	16:08:04		2.9261	52.91	13.647	0.97	-0.714	2.9261	
0.5291	1.3647	0.097	-0.0714						
11-17-2009	16:09:03		2.8965	50.39	13.718	0.71	-0.580	2.8965	
0.5039	1.3718	0.071	-0.0580						
11-17-2009	16:10:04		2.9093	50.36	13.610	0.70	-0.702	2.9093	
0.5036	1.3610	0.070	-0.0702						
Average of Test	Run		O2	CO	NOx	THC	SO2	O2	CO
NOx	THC	SO2							
	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
ppm									
11-17-2009	16:10:04		2.8115	56.48	13.839	0.67	-0.756	2.8115	
0.5648	1.3839	0.067	-0.0756						

Test Run 1 End

Final System Bias Check for Run 1 . STRATA Version 2.0

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts
11-17-2009	16:11:09		2.8919	55.18	13.726	0.57	-0.623	2.8919	
0.5518 1.3726	0.057	-0.0623							
11-17-2009	16:12:09		2.1690	41.19	13.504	6.77	-0.631	2.1690	
0.4119 1.3504	0.677	-0.0631							
11-17-2009	16:13:08		0.2245	2.17	0.984	0.87	-0.352	0.2245	
0.0217 0.0984	0.087	-0.0352							
11-17-2009	16:14:09		0.3646	2.28	0.467	0.54	-0.459	0.3646	
0.0228 0.0467	0.054	-0.0459							
11-17-2009	16:15:10		4.7248	1.87	0.500	8.66	-1.047	4.7248	
0.0187 0.0500	0.866	-0.1047							
11-17-2009	16:16:09		5.0530	1.53	0.425	51.17	-1.316	5.0530	
0.0153 0.0425	5.117	-0.1316							
11-17-2009	16:17:09		5.0013	5.62	0.369	52.25	-1.305	5.0013	
0.0562 0.0369	5.225	-0.1305							
11-17-2009	16:18:09		0.6003	130.47	0.363	43.53	-0.977	0.6003	
1.3047 0.0363	4.353	-0.0977							
11-17-2009	16:19:09		0.2582	134.30	0.334	22.43	-0.695	0.2582	
1.3430 0.0334	2.243	-0.0695							
11-17-2009	16:20:09		0.2633	9.20	16.935	2.46	-0.218	0.2633	
0.0920 1.6935	0.246	-0.0218							
11-17-2009	16:21:09		0.2843	1.86	24.012	1.71	0.273	0.2843	
0.0186 2.4012	0.171	0.0273							
11-17-2009	16:22:09		1.3287	12.54	15.322	10.47	2.991	1.3287	
0.1254 1.5322	1.047	0.2991							
11-17-2009	16:23:09		1.2919	28.41	0.560	1.46	15.308	1.2919	
0.2841 0.0560	0.146	1.5308							
11-17-2009	16:24:09		0.7283	37.64	0.173	0.92	20.673	0.7283	
0.3764 0.0173	0.092	2.0673							
11-17-2009	16:25:09		1.8045	54.79	0.094	0.85	22.570	1.8045	
0.5479 0.0094	0.085	2.2570							

Final System Bias Check for Run 1

Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	Reference Cylinder Numbers Zero	Span
O2	N2	cc9824
CO	N2	ALM014290
NOx	N2	cc241846
THC	AIR	cc236179
SO2	N2	cc144163

Date/Time 11-17-2009 16:25:15 PASSED

Analyte	O2	CO	NOx	THC	SO2	
Units	%	ppm	ppm	ppm	ppm	
Zero Ref Cyl		0.0000	0.00	0.000	0.00	0.000
Zero Cal		0.0277	-0.33	0.082	0.07	-0.051
Zero Avg		0.2382	2.34	0.527	0.81	-0.255
Zero Bias%		2.2	0.9	0.8	0.7	0.4
Zero Drift%		1.6	1.1	0.2	0.7	-0.4
Span Ref Cyl		4.9400	132.00	24.600	52.60	22.200
Span Cal		4.9458	130.54	24.745	52.76	22.167
Span Avg		5.0551	134.63	23.652	52.19	22.550
Span Bias%		1.2	1.4	2.0	0.6	0.8
Span Drift%		1.3	0.9	-1.3	0.1	-0.8
Ini Zero Avg		0.0898	-0.89	0.406	0.15	-0.073

				FBIAS01		
Ini Span Avg		4.9272	132.07	24.342	52.13	22.905
Run Avg	2.8115	56.48	13.839	0.67	-0.756	
Co	0.1640	0.73	0.466	0.48	-0.164	
Cm	4.9911	133.35	23.997	52.16	22.727	
Correct Avg		2.7093	55.49	13.980	0.19	-0.575

A26

CALERR02

Calibration Error Test at Run 2 . STRATA Version 2.0

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts
11-18-2009	09:01:02		0.7489	48.72	1.845	1.54	-2.135	0.7489	0.4872 0.1845
	0.154	-0.2135							
11-18-2009	09:02:03		0.6980	39.63	0.419	2.78	-1.398	0.6980	0.3963 0.0419
	0.278	-0.1398							
11-18-2009	09:03:02		0.8948	39.65	0.147	0.80	-1.176	0.8948	0.3965 0.0147
	0.080	-0.1176							
11-18-2009	09:04:02		0.0514	18.96	0.079	0.64	-1.195	0.0514	0.1896 0.0079
	0.064	-0.1195							
11-18-2009	09:05:02		0.0911	9.50	0.080	0.55	0.152	0.0911	0.0950 0.0080
	0.055	0.0152							
11-18-2009	09:06:02		0.1159	8.67	0.080	0.50	0.298	0.1159	0.0867 0.0080
	0.050	0.0298							
11-18-2009	09:07:02		0.1339	4.90	0.044	0.47	0.223	0.1339	0.0490 0.0044
	0.047	0.0223							
11-18-2009	09:08:02		0.1443	0.52	-0.144	0.44	0.556	0.1443	0.0052 -0.0144
	0.044	0.0556							
11-18-2009	09:09:02		2.3652	5.65	-0.194	0.41	2.747	2.3652	0.0565 -0.0194
	0.041	0.2747							
11-18-2009	09:10:02		5.0814	7.54	18.798	12.81	5.235	5.0814	0.0754 1.8798
	1.281	0.5235							
11-18-2009	09:11:03		4.9976	7.11	27.534	90.46	20.692	4.9976	0.0711 2.7534
	9.046	2.0692							
11-18-2009	09:12:02		4.9569	7.97	27.490	88.16	23.171	4.9569	0.0797 2.7490
	8.816	2.3171							
11-18-2009	09:13:02		4.9670	7.34	25.855	88.39	22.172	4.9670	0.0734 2.5855
	8.839	2.2172							
11-18-2009	09:14:02		4.9561	7.71	24.760	88.45	21.863	4.9561	0.0771 2.4760
	8.845	2.1863							
11-18-2009	09:15:02		6.8948	9.34	22.758	88.49	5.268	6.8948	0.0934 2.2758
	8.849	0.5268							
11-18-2009	09:16:02		9.4039	9.17	54.640	58.41	19.454	9.4039	0.0917 5.4640
	5.841	1.9454							
11-18-2009	09:17:02		9.4851	9.59	54.716	52.79	45.989	9.4851	0.0959 5.4716
	5.279	4.5989							
11-18-2009	09:18:02		9.4979	10.04	53.859	52.73	47.490	9.4979	0.1004 5.3859
	5.273	4.7490							
11-18-2009	09:19:02		7.7876	30.00	53.894	52.69	38.936	7.7876	0.3000 5.3894
	5.269	3.8936							
11-18-2009	09:20:03		0.1818	116.64	8.885	49.52	1.833	0.1818	1.1664 0.8885
	4.952	0.1833							
11-18-2009	09:21:02		0.1402	133.32	0.519	30.86	0.007	0.1402	1.3332 0.0519
	3.086	0.0007							
11-18-2009	09:22:02		0.1469	132.40	0.464	30.82	-0.187	0.1469	1.3240 0.0464
	3.082	-0.0187							
11-18-2009	09:23:02		0.1527	132.74	0.466	30.83	-0.298	0.1527	1.3274 0.0466
	3.083	-0.0298							
11-18-2009	09:24:02		0.1543	132.65	0.464	30.82	-0.320	0.1543	1.3265 0.0464
	3.082	-0.0320							
11-18-2009	09:25:02		0.4967	233.00	0.462	30.83	-0.384	0.4967	2.3300 0.0462
	3.083	-0.0384							
11-18-2009	09:26:02		0.1419	295.51	0.461	30.82	-0.330	0.1419	2.9551 0.0461
	3.082	-0.0330							

Calibration Error Test at Run 2
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX
Reference Cylinder Numbers

A27

CALERR02

	Zero	Low-range		Mid-range		High-range
O2	N2		cc9824	cc55212		
CO	N2		ALM014290		cc111686	
NOx	N2	cc161053		cc241846		cc61285
THC	AIR	cc161053		cc236179		cc151954
SO2	N2	cc204173		cc144163		cc57866

Date/Time	11-18-2009		09:26:18		PASSED
Analyte O2	CO	NOx	THC	SO2	
Units %	ppm	ppm	ppm	ppm	
Zero Ref Cyl	0.0000	0.00	0.000	0.00	0.000
Zero Avg	0.1396	2.22	0.038	0.46	0.171
Zero Error%	1.5	0.7	0.1	0.5	0.4
Low Ref Cyl				31.00	
Low Avg			30.85		
Low Error%				0.1	
Mid Ref Cyl	4.9400	132.00	24.600	52.60	22.200
Mid Avg 4.9706	133.21	24.683	52.73	22.126	
Mid Error%	0.3	0.4	0.2	0.1	0.2
High Ref Cyl	9.4900	297.00	53.700	88.40	47.300
High Avg	9.4999	295.48	53.865	88.42	47.519
High Error%	0.1	0.5	0.3	0.0	0.5

AZ 8

IBIAS02

Initial System Bias Check for Run 2 . STRATA Version 2.0

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts	Volts
11-18-2009	09:27:28		8.3558	110.32	0.528	18.22	-0.430	8.3558	1.1032	0.0528
	1.822	-0.0430								
11-18-2009	09:28:28		9.1650	11.84	0.670	3.44	-0.514	9.1650	0.1184	0.0670
	0.344	-0.0514								
11-18-2009	09:29:28		-0.8743	12.00	0.764	4.18	0.103	-0.8743	0.1200	0.0764
	0.418	0.0103								
11-18-2009	09:30:28		-0.0068	11.04	0.757	0.24	0.253	-0.0068	0.1104	0.0757
	0.024	0.0253								
11-18-2009	09:31:28		0.0612	12.01	0.663	0.21	0.169	0.0612	0.1201	0.0663
	0.021	0.0169								
11-18-2009	09:32:28		3.8197	12.60	0.681	0.37	0.003	3.8197	0.1260	0.0681
	0.037	0.0003								
11-18-2009	09:33:28		4.9630	12.69	0.626	51.06	-0.248	4.9630	0.1269	0.0626
	5.106	-0.0248								
11-18-2009	09:34:29		5.1023	13.62	0.523	52.33	-0.132	5.1023	0.1362	0.0523
	5.233	-0.0132								
11-18-2009	09:35:28		3.5821	78.84	0.463	52.41	-0.199	3.5821	0.7884	0.0463
	5.241	-0.0199								
11-18-2009	09:36:29		0.9386	131.32	0.370	24.31	0.235	0.9386	1.3132	0.0370
	2.431	0.0235								
11-18-2009	09:37:28		1.1350	64.52	7.657	2.68	0.334	1.1350	0.6452	0.7657
	0.268	0.0334								
11-18-2009	09:38:28		1.0324	15.60	23.664	2.18	1.083	1.0324	0.1560	2.3664
	0.218	0.1083								
11-18-2009	09:39:28		1.0657	17.25	23.856	1.84	1.102	1.0657	0.1725	2.3856
	0.184	0.1102								
11-18-2009	09:40:28		2.1277	20.39	16.371	1.49	2.992	2.1277	0.2039	1.6371
	0.149	0.2992								
11-18-2009	09:41:28		4.2757	55.89	4.283	1.81	21.609	4.2757	0.5589	0.4283
	0.181	2.1609								

Initial System Bias Check for Run 2

Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	Reference Cylinder Numbers	
	Zero	Span
O2	N2	cc9824
CO	N2	ALM014290
NOx	N2	cc241846
THC	AIR	cc236179
SO2	N2	cc144163

Date/Time 11-18-2009 09:42:15 PASSED

Analyte	O2	CO	NOx	THC	SO2
Units	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0.0000	0.00	0.000	0.00	0.000
Zero Cal	0.1396	2.22	0.038	0.46	0.171
Zero Avg	0.0155	10.99	0.723	0.23	0.244
Zero Bias%	1.3	3.0	1.3	0.2	0.2
Zero Drift%					
Span Ref Cyl	4.9400	132.00	24.600	52.60	22.200
Span Cal	4.9706	133.21	24.683	52.73	22.126
Span Avg	5.0865	130.98	23.864	52.29	22.471
Span Bias%	1.2	0.7	1.5	0.4	0.7
Span Drift%					

A29

RUN02

Test Run 2 Begin. STRATA Version 2.0
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts		
11-18-2009	09:43:16		5.6882	46.30	2.848	1.12	13.480	5.6882		
0.4630	0.2848	0.112	1.3480							
11-18-2009	09:44:16		8.0246*	71.63	5.202	0.87	0.142	8.0246*		
0.7163	0.5202	0.087	0.0142							
11-18-2009	09:45:15		3.0165	78.94	11.002	1.85	0.026	3.0165		
0.7894	1.1002	0.185	0.0026							
11-18-2009	09:46:16		2.9385	75.53	11.676	0.85	0.142	2.9385		
0.7553	1.1676	0.085	0.0142							
11-18-2009	09:47:15		2.9371	90.75	11.859	1.53	0.118	2.9371		
0.9075	1.1859	0.153	0.0118							
11-18-2009	09:48:16		2.8276	99.22	12.303	1.63	0.185	2.8276		
0.9922	1.2303	0.163	0.0185							
11-18-2009	09:49:15		2.7444	91.28	12.615	2.12	0.226	2.7444		
0.9128	1.2615	0.212	0.0226							
11-18-2009	09:50:16		2.7794	71.62	12.862	1.22	0.206	2.7794		
0.7162	1.2862	0.122	0.0206							
11-18-2009	09:51:15		2.8980	67.30	12.796	0.97	0.161	2.8980		
0.6730	1.2796	0.097	0.0161							
11-18-2009	09:52:16		2.8810	59.48	13.014	0.62	0.269	2.8810		
0.5948	1.3014	0.062	0.0269							
11-18-2009	09:53:16		2.8600	75.32	12.862	0.91	0.200	2.8600		
0.7532	1.2862	0.091	0.0200							
11-18-2009	09:54:15		2.9329	84.52	12.953	0.72	0.289	2.9329		
0.8452	1.2953	0.072	0.0289							
11-18-2009	09:55:16		2.8108	90.69	13.233	1.39	0.303	2.8108		
0.9069	1.3233	0.139	0.0303							
11-18-2009	09:56:15		2.7636	82.59	13.493	1.77	0.498	2.7636		
0.8259	1.3493	0.177	0.0498							
11-18-2009	09:57:16		2.8059	96.29	13.569	1.18	0.349	2.8059		
0.9629	1.3569	0.118	0.0349							
11-18-2009	09:58:15		2.8290	88.08	13.672	1.99	0.484	2.8290		
0.8808	1.3672	0.199	0.0484							
11-18-2009	09:59:16		2.8220	75.68	13.912	1.82	0.267	2.8220		
0.7568	1.3912	0.182	0.0267							
11-18-2009	10:00:15		2.9117	71.01	13.776	1.00	0.495	2.9117		
0.7101	1.3776	0.100	0.0495							
11-18-2009	10:01:16		2.8201	69.70	13.971	0.85	0.402	2.8201		
0.6970	1.3971	0.085	0.0402							
11-18-2009	10:02:16		2.7846	60.42	14.094	1.03	0.369	2.7846		
0.6042	1.4094	0.103	0.0369							
11-18-2009	10:03:15		2.8349	82.36	13.837	0.90	0.439	2.8349		
0.8236	1.3837	0.090	0.0439							
11-18-2009	10:04:16		2.7533	91.48	13.840	1.96	0.611	2.7533		
0.9148	1.3840	0.196	0.0611							
11-18-2009	10:05:15		2.7210	91.59	13.815	1.67	0.531	2.7210		
0.9159	1.3815	0.167	0.0531							
11-18-2009	10:06:16		2.7213	79.16	13.721	2.21	0.663	2.7213		
0.7916	1.3721	0.221	0.0663							
11-18-2009	10:07:15		2.7804	69.60	13.680	1.03	0.524	2.7804		
0.6960	1.3680	0.103	0.0524							
11-18-2009	10:08:16		2.8644	82.32	13.374	1.20	0.529	2.8644		
0.8232	1.3374	0.120	0.0529							
11-18-2009	10:09:15		2.8558	66.39	13.327	1.04	0.452	2.8558		
0.6639	1.3327	0.104	0.0452							
11-18-2009	10:10:16		2.8514	84.42	13.374	0.85	0.464	2.8514		

A30

0.8442 1.3374	0.085 0.0464						
11-18-2009	10:11:16	2.8422	79.77	13.261	2.00	0.350	2.8422
0.7977 1.3261	0.200 0.0350						
11-18-2009	10:12:15	2.8378	83.13	13.202	1.16	0.466	2.8378
0.8313 1.3202	0.116 0.0466						
11-18-2009	10:13:16	2.8952	91.99	13.162	1.19	0.485	2.8952
0.9199 1.3162	0.119 0.0485						
11-18-2009	10:14:15	2.9278	80.76	13.209	1.77	0.483	2.9278
0.8076 1.3209	0.177 0.0483						
11-18-2009	10:15:16	2.8996	99.35	12.993	1.50	0.514	2.8996
0.9935 1.2993	0.150 0.0514						
11-18-2009	10:16:15	2.8954	78.25	13.162	1.69	0.483	2.8954
0.7825 1.3162	0.169 0.0483						
11-18-2009	10:17:16	2.9535	97.13	13.133	1.05	0.456	2.9535
0.9713 1.3133	0.105 0.0456						
11-18-2009	10:18:15	2.9420	98.48	13.094	1.87	0.482	2.9420
0.9848 1.3094	0.187 0.0482						
11-18-2009	10:19:16	2.9768	87.46	13.018	1.02	0.385	2.9768
0.8746 1.3018	0.102 0.0385						
11-18-2009	10:20:15	2.9517	71.06	13.040	1.38	0.465	2.9517
0.7106 1.3040	0.138 0.0465						
11-18-2009	10:21:15	2.9356	81.23	13.052	0.96	0.530	2.9356
0.8123 1.3052	0.096 0.0530						
11-18-2009	10:22:16	2.9591	92.87	13.124	1.52	0.515	2.9591
0.9287 1.3124	0.152 0.0515						
11-18-2009	10:23:15	2.9210	90.46	13.034	1.73	0.581	2.9210
0.9046 1.3034	0.173 0.0581						
11-18-2009	10:24:16	2.9862	83.11	13.033	1.34	0.415	2.9862
0.8311 1.3033	0.134 0.0415						
11-18-2009	10:25:15	2.9937	89.67	12.908	1.48	0.649	2.9937
0.8967 1.2908	0.148 0.0649						
11-18-2009	10:26:16	2.9773	90.75	12.993	1.24	0.567	2.9773
0.9075 1.2993	0.124 0.0567						
11-18-2009	10:27:15	3.0596	103.84	12.891	1.21	0.614	3.0596
1.0384 1.2891	0.121 0.0614						
11-18-2009	10:28:16	3.0895	81.98	13.041	1.28	0.597	3.0895
0.8198 1.3041	0.128 0.0597						
11-18-2009	10:29:16	3.0498	80.61	12.951	0.64	0.613	3.0498
0.8061 1.2951	0.064 0.0613						
11-18-2009	10:30:15	3.0717	110.98	13.083	1.09	0.702	3.0717
1.1098 1.3083	0.109 0.0702						
11-18-2009	10:31:16	2.8976	101.75	13.295	2.08	0.681	2.8976
1.0175 1.3295	0.208 0.0681						
11-18-2009	10:32:15	2.8794	116.77	13.460	2.03	0.717	2.8794
1.1677 1.3460	0.203 0.0717						
11-18-2009	10:33:16	2.8806	109.92	13.396	3.11	0.584	2.8806
1.0992 1.3396	0.311 0.0584						
11-18-2009	10:34:15	2.9690	82.89	13.356	1.61	0.629	2.9690
0.8289 1.3356	0.161 0.0629						
11-18-2009	10:35:16	3.0761	73.90	13.144	1.29	0.563	3.0761
0.7390 1.3144	0.129 0.0563						
11-18-2009	10:36:15	3.1194	66.94	13.285	0.54	0.581	3.1194
0.6694 1.3285	0.054 0.0581						
11-18-2009	10:37:16	3.0851	73.05	13.081	0.92	0.627	3.0851
0.7305 1.3081	0.092 0.0627						
11-18-2009	10:38:15	3.0981	73.20	13.214	0.67	0.684	3.0981
0.7320 1.3214	0.067 0.0684						
11-18-2009	10:39:16	3.0685	76.95	13.261	0.63	0.547	3.0685
0.7695 1.3261	0.063 0.0547						
11-18-2009	10:40:16	3.0244	85.84	13.141	1.23	0.596	3.0244
0.8584 1.3141	0.123 0.0596						
11-18-2009	10:41:15	3.0556	88.28	13.051	1.44	0.594	3.0556
0.8828 1.3051	0.144 0.0594						

RUN02

11-18-2009	10:42:16	3.0006	93.04	12.824	1.36	0.604	3.0006
0.9304 1.2824	0.136 0.0604						
11-18-2009	10:43:15	3.0305	102.02	12.753	1.01	0.597	3.0305
1.0202 1.2753	0.101 0.0597						
11-18-2009	10:44:16	3.0232	91.20	12.813	1.18	0.608	3.0232
0.9120 1.2813	0.118 0.0608						
11-18-2009	10:45:15	3.0562	97.79	12.832	1.25	0.690	3.0562
0.9779 1.2832	0.125 0.0690						
11-18-2009	10:46:16	3.0669	81.07	12.765	1.04	0.803	3.0669
0.8107 1.2765	0.104 0.0803						
11-18-2009	10:47:15	3.0300	99.77	12.633	1.08	0.595	3.0300
0.9977 1.2633	0.108 0.0595						
11-18-2009	10:48:15	3.1059	97.72	12.715	1.08	0.621	3.1059
0.9772 1.2715	0.108 0.0621						
11-18-2009	10:49:16	3.0711	124.79	12.609	1.68	0.613	3.0711
1.2479 1.2609	0.168 0.0613						
11-18-2009	10:50:15	3.0866	108.15	12.449	1.31	0.668	3.0866
1.0815 1.2449	0.131 0.0668						
11-18-2009	10:51:16	3.0802	108.09	12.536	1.41	0.731	3.0802
1.0809 1.2536	0.141 0.0731						
11-18-2009	10:52:15	3.0740	104.61	12.448	1.35	0.640	3.0740
1.0461 1.2448	0.135 0.0640						
11-18-2009	10:53:16	3.0919	90.55	12.614	1.35	0.598	3.0919
0.9055 1.2614	0.135 0.0598						
11-18-2009	10:54:15	3.1501	98.03	12.593	0.98	0.580	3.1501
0.9803 1.2593	0.098 0.0580						
11-18-2009	10:55:16	3.1556	99.96	12.564	1.02	0.577	3.1556
0.9996 1.2564	0.102 0.0577						
11-18-2009	10:56:15	3.1111	103.33	12.716	1.29	0.559	3.1111
1.0333 1.2716	0.129 0.0559						
11-18-2009	10:57:16	3.1431	92.35	12.841	1.00	0.763	3.1431
0.9235 1.2841	0.100 0.0763						
11-18-2009	10:58:16	3.3006	103.36	12.862	0.76	0.713	3.3006
1.0336 1.2862	0.076 0.0713						
11-18-2009	10:59:15	3.2818	94.51	12.814	0.82	0.804	3.2818
0.9451 1.2814	0.082 0.0804						
11-18-2009	11:00:16	3.3088	96.15	12.893	0.82	0.806	3.3088
0.9615 1.2893	0.082 0.0806						
11-18-2009	11:01:15	3.2923	90.08	13.125	0.88	0.747	3.2923
0.9008 1.3125	0.088 0.0747						
11-18-2009	11:02:16	3.2847	75.59	13.308	0.58	0.705	3.2847
0.7559 1.3308	0.058 0.0705						
11-18-2009	11:03:15	3.2446	66.24	13.309	0.63	0.684	3.2446
0.6624 1.3309	0.063 0.0684						
11-18-2009	11:04:16	3.2195	71.93	13.523	0.68	0.754	3.2195
0.7193 1.3523	0.068 0.0754						
11-18-2009	11:05:15	3.0668	69.38	13.748	0.91	0.705	3.0668
0.6938 1.3748	0.091 0.0705						
11-18-2009	11:06:16	3.0491	67.16	13.860	0.99	0.772	3.0491
0.6716 1.3860	0.099 0.0772						
11-18-2009	11:07:16	3.0481	49.74	14.111	0.62	0.736	3.0481
0.4974 1.4111	0.062 0.0736						
11-18-2009	11:08:15	3.1593	51.25	13.741	0.40	0.813	3.1593
0.5125 1.3741	0.040 0.0813						
11-18-2009	11:09:16	3.1685	56.26	13.611	0.33	0.666	3.1685
0.5626 1.3611	0.033 0.0666						
11-18-2009	11:10:15	3.1945	51.09	13.689	0.41	0.843	3.1945
0.5109 1.3689	0.041 0.0843						
11-18-2009	11:11:16	3.1805	68.14	13.416	0.54	0.584	3.1805
0.6814 1.3416	0.054 0.0584						
11-18-2009	11:12:15	3.2806	63.78	13.363	0.89	0.703	3.2806
0.6378 1.3363	0.089 0.0703						
11-18-2009	11:13:16	3.2463	69.60	13.188	0.42	0.664	3.2463

0.6960 1.3188 0.042 0.0664
11-18-2009 11:14:15 3.2435 64.31 13.171 0.55 0.611 3.2435
0.6431 1.3171 0.055 0.0611
11-18-2009 11:15:16 3.2857 82.99 13.192 0.49 0.724 3.2857
0.8299 1.3192 0.049 0.0724
Begin calculating run averages
11-18-2009 11:16:52 3.1610 63.63 13.581 0.96 0.824 3.1610
0.6363 1.3581 0.096 0.0824
11-18-2009 11:17:53 3.2261 64.71 13.369 0.59 0.831 3.2261
0.6471 1.3369 0.059 0.0831
11-18-2009 11:18:52 3.2242 61.91 13.492 0.49 0.796 3.2242
0.6191 1.3492 0.049 0.0796
11-18-2009 11:19:53 3.2092 67.01 13.486 0.48 0.666 3.2092
0.6701 1.3486 0.048 0.0666
11-18-2009 11:20:52 3.2466 63.22 13.642 0.56 0.580 3.2466
0.6322 1.3642 0.056 0.0580
11-18-2009 11:21:53 3.2239 57.45 13.499 0.55 0.646 3.2239
0.5745 1.3499 0.055 0.0646
11-18-2009 11:22:52 3.2497 53.00 13.508 0.33 0.812 3.2497
0.5300 1.3508 0.033 0.0812
11-18-2009 11:23:52 3.1591 70.30 13.579 0.51 0.611 3.1591
0.7030 1.3579 0.051 0.0611
11-18-2009 11:24:52 3.1170 68.62 13.812 0.93 0.646 3.1170
0.6862 1.3812 0.093 0.0646
11-18-2009 11:25:52 3.0327 65.99 13.949 0.99 0.545 3.0327
0.6599 1.3949 0.099 0.0545
11-18-2009 11:26:53 3.1023 69.51 13.778 0.89 0.711 3.1023
0.6951 1.3778 0.089 0.0711
11-18-2009 11:27:52 3.1805 47.16 13.588 0.78 0.713 3.1805
0.4716 1.3588 0.078 0.0713
11-18-2009 11:28:53 3.1545 52.70 13.362 0.42 0.727 3.1545
0.5270 1.3362 0.042 0.0727
11-18-2009 11:29:52 3.1253 50.79 13.589 0.31 0.729 3.1253
0.5079 1.3589 0.031 0.0729
11-18-2009 11:30:53 3.0684 59.69 13.475 0.57 0.683 3.0684
0.5969 1.3475 0.057 0.0683
11-18-2009 11:31:52 3.0840 73.32 13.300 1.12 0.788 3.0840
0.7332 1.3300 0.112 0.0788
11-18-2009 11:32:53 3.1132 63.20 13.403 0.66 0.901 3.1132
0.6320 1.3403 0.066 0.0901
11-18-2009 11:33:52 3.1516 64.00 13.361 0.49 0.747 3.1516
0.6400 1.3361 0.049 0.0747
11-18-2009 11:34:52 3.1107 77.42 13.297 0.85 0.751 3.1107
0.7742 1.3297 0.085 0.0751
11-18-2009 11:35:53 3.1301 83.90 13.406 1.49 0.748 3.1301
0.8390 1.3406 0.149 0.0748
11-18-2009 11:36:52 2.9835 84.11 13.600 1.52 0.645 2.9835
0.8411 1.3600 0.152 0.0645
11-18-2009 11:37:53 2.9748 89.60 13.637 1.52 0.633 2.9748
0.8960 1.3637 0.152 0.0633
11-18-2009 11:38:52 2.9699 84.12 13.754 1.63 0.777 2.9699
0.8412 1.3754 0.163 0.0777
11-18-2009 11:39:53 3.0575 74.69 13.880 1.11 0.680 3.0575
0.7469 1.3880 0.111 0.0680
11-18-2009 11:40:52 3.0147 82.16 13.803 1.33 0.731 3.0147
0.8216 1.3803 0.133 0.0731
11-18-2009 11:41:53 3.0488 71.52 13.929 1.42 0.561 3.0488
0.7152 1.3929 0.142 0.0561
11-18-2009 11:42:52 2.9865 77.31 14.018 1.39 0.649 2.9865
0.7731 1.4018 0.139 0.0649
11-18-2009 11:43:52 2.9450 73.12 13.946 1.41 0.798 2.9450
0.7312 1.3946 0.141 0.0798
11-18-2009 11:44:53 3.0176 71.65 14.016 0.74 0.748 3.0176

0.7165 1.4016	0.074 0.0748						
11-18-2009	11:45:52	2.9903	68.38	13.934	1.34	0.774	2.9903
0.6838 1.3934	0.134 0.0774						
11-18-2009	11:46:53	2.9673	77.18	14.001	0.96	0.709	2.9673
0.7718 1.4001	0.096 0.0709						
11-18-2009	11:47:52	2.9888	71.39	14.034	1.48	0.646	2.9888
0.7139 1.4034	0.148 0.0646						
11-18-2009	11:48:53	2.9710	70.44	14.017	0.99	0.636	2.9710
0.7044 1.4017	0.099 0.0636						
11-18-2009	11:49:52	2.9999	70.98	14.000	0.97	0.662	2.9999
0.7098 1.4000	0.097 0.0662						
11-18-2009	11:50:53	2.9870	57.35	14.150	0.83	0.665	2.9870
0.5735 1.4150	0.083 0.0665						
11-18-2009	11:51:52	3.0213	58.90	14.044	0.96	0.749	3.0213
0.5890 1.4044	0.096 0.0749						
11-18-2009	11:52:52	3.0774	68.09	13.856	0.62	0.718	3.0774
0.6809 1.3856	0.062 0.0718						
11-18-2009	11:53:52	3.0482	58.67	14.023	1.27	0.812	3.0482
0.5867 1.4023	0.127 0.0812						
11-18-2009	11:54:52	3.0448	46.92	14.000	0.49	0.713	3.0448
0.4692 1.4000	0.049 0.0713						
11-18-2009	11:55:53	3.0853	68.78	13.719	0.64	0.686	3.0853
0.6878 1.3719	0.064 0.0686						
11-18-2009	11:56:52	3.1326	57.47	13.736	0.60	0.619	3.1326
0.5747 1.3736	0.060 0.0619						
11-18-2009	11:57:53	3.1214	61.59	13.597	0.45	0.692	3.1214
0.6159 1.3597	0.045 0.0692						
11-18-2009	11:58:52	3.1005	68.89	13.620	0.54	0.678	3.1005
0.6889 1.3620	0.054 0.0678						
11-18-2009	11:59:53	3.1154	64.50	13.566	0.85	0.721	3.1154
0.6450 1.3566	0.085 0.0721						
11-18-2009	12:00:52	3.1186	70.77	13.492	0.56	0.660	3.1186
0.7077 1.3492	0.056 0.0660						
11-18-2009	12:01:52	3.0293	72.72	13.812	0.99	0.770	3.0293
0.7272 1.3812	0.099 0.0770						
11-18-2009	12:02:52	2.9453	70.46	13.728	0.94	0.707	2.9453
0.7046 1.3728	0.094 0.0707						
11-18-2009	12:03:52	3.0710	64.37	13.771	1.43	0.644	3.0710
0.6437 1.3771	0.143 0.0644						
11-18-2009	12:04:53	3.0135	52.67	13.769	0.75	0.521	3.0135
0.5267 1.3769	0.075 0.0521						
11-18-2009	12:05:52	3.0961	73.31	13.586	0.60	0.691	3.0961
0.7331 1.3586	0.060 0.0691						
11-18-2009	12:06:53	3.0948	67.61	13.596	0.60	0.683	3.0948
0.6761 1.3596	0.060 0.0683						
11-18-2009	12:07:52	3.0199	72.66	13.579	0.90	0.473	3.0199
0.7266 1.3579	0.090 0.0473						
11-18-2009	12:08:53	3.0603	73.03	13.568	0.94	0.717	3.0603
0.7303 1.3568	0.094 0.0717						
11-18-2009	12:09:52	3.1469	55.82	13.491	0.58	0.580	3.1469
0.5582 1.3491	0.058 0.0580						
11-18-2009	12:10:53	3.1398	71.85	13.442	0.50	0.642	3.1398
0.7185 1.3442	0.050 0.0642						
11-18-2009	12:11:52	3.0718	71.87	13.532	0.90	0.575	3.0718
0.7187 1.3532	0.090 0.0575						
11-18-2009	12:12:52	3.1567	72.28	13.415	0.72	0.614	3.1567
0.7228 1.3415	0.072 0.0614						
11-18-2009	12:13:53	3.1571	76.81	13.593	0.97	0.566	3.1571
0.7681 1.3593	0.097 0.0566						
11-18-2009	12:14:52	3.0604	59.98	13.753	0.75	0.487	3.0604
0.5998 1.3753	0.075 0.0487						
11-18-2009	12:15:53	3.1332	77.26	13.458	0.57	0.550	3.1332
0.7726 1.3458	0.057 0.0550						

RUN02

Average of Test Run		O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm		
11-18-2009	12:15:53	3.0839	67.65	13.682	0.86	0.684	3.0839				
0.6765	1.3682	0.086	0.0684								

Test Run 2 End

A35

FBIAS02

Final System Bias Check for Run 2 . STRATA Version 2.0

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts Volts
11-18-2009	12:18:11		1.0384	14.22	0.603	8.26	0.830	1.0384	0.1422 0.0603
0.826	0.0830								
11-18-2009	12:19:11		0.8857	14.14	0.415	0.09	0.849	0.8857	0.1414 0.0415
0.009	0.0849								
11-18-2009	12:20:11		0.1466	15.66	0.353	0.02	0.912	0.1466	0.1566 0.0353
0.002	0.0912								
11-18-2009	12:21:12		0.1640	16.42	0.265	0.00	0.802	0.1640	0.1642 0.0265
0.000	0.0802								
11-18-2009	12:22:11		0.0624	15.78	0.261	-0.01	0.464	0.0624	0.1578 0.0261
-0.001	0.0464								
11-18-2009	12:23:12		2.7803	15.91	0.275	-0.02	0.261	2.7803	0.1591 0.0275
-0.002	0.0261								
11-18-2009	12:24:11		4.8965	13.57	0.258	5.98	-0.068	4.8965	0.1357 0.0258
0.598	-0.0068								
11-18-2009	12:25:12		4.9517	13.62	0.260	51.50	-0.137	4.9517	0.1362 0.0260
5.150	-0.0137								
11-18-2009	12:26:11		5.0548	17.93	0.261	51.73	-0.090	5.0548	0.1793 0.0261
5.173	-0.0090								
11-18-2009	12:27:12		0.4445	129.65	0.257	51.65	0.153	0.4445	1.2965 0.0257
5.165	0.0153								
11-18-2009	12:28:11		-0.2007	134.25	0.257	3.70	0.490	-0.2007	1.3425 0.0257
0.370	0.0490								
11-18-2009	12:29:11		0.2318	49.21	8.178	1.89	0.490	0.2318	0.4921 0.8178
0.189	0.0490								
11-18-2009	12:30:11		-0.0591	13.83	24.541	1.07	1.439	-0.0591	0.1383 2.4541
0.107	0.1439								
11-18-2009	12:31:11		0.1922	13.59	24.639	0.93	1.501	0.1922	0.1359 2.4639
0.093	0.1501								
11-18-2009	12:32:11		2.8179	43.01	6.463	1.22	14.719	2.8179	0.4301 0.6463
0.122	1.4719								
11-18-2009	12:33:11		4.7786	67.95	3.919	1.48	22.640	4.7786	0.6795 0.3919
0.148	2.2640								

Final System Bias Check for Run 2

Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	Reference Cylinder Numbers Zero	Span
O2	N2	cc9824
CO	N2	ALM014290
NOx	N2	cc241846
THC	AIR	cc236179
SO2	N2	cc144163

Date/Time 11-18-2009 12:33:17 PASSED

Analyte	O2	CO	NOx	THC	SO2
Units	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0.0000	0.00	0.000	0.00	0.000
Zero Cal	0.1396	2.22	0.038	0.46	0.171
Zero Avg	0.1593	16.14	0.313	0.01	0.872
Zero Bias%	0.2	4.7	0.5	0.4	1.5
Zero Drift%	1.5	1.7	-0.8	-0.2	1.3
Span Ref Cyl	4.9400	132.00	24.600	52.60	22.200
Span Cal	4.9706	133.21	24.683	52.73	22.126
Span Avg	4.9520	133.58	24.543	51.60	22.653
Span Bias%	0.2	0.1	0.3	1.1	1.1
Span Drift%	-1.4	0.9	1.3	-0.7	0.4

Ini Zero Avg		0.0155	10.99	0.723	0.23	0.244
Ini Span Avg		5.0865	130.98	23.864	52.29	22.471
Run Avg	3.0839	67.65	13.682	0.86	0.684	
Co	0.0874	13.57	0.518	0.12	0.558	
Cm	5.0192	132.28	24.204	51.94	22.562	
Correct Avg		3.0015	60.14	13.672	0.75	0.127

RUN03

Test Run 3 Begin. STRATA Version 2.0
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts		
11-18-2009	12:34:17		4.8856	54.51	3.229	1.51	12.157	4.8856		
0.5451	0.3229	0.151	1.2157							
11-18-2009	12:35:18		8.0911*	49.02	4.428	1.65	-0.153	8.0911*		
0.4902	0.4428	0.165	-0.0153							
11-18-2009	12:36:17		2.2050	79.76	12.594	0.97	0.234	2.2050		
0.7976	1.2594	0.097	0.0234							
11-18-2009	12:37:18		2.2023	82.59	12.826	0.92	0.834	2.2023		
0.8259	1.2826	0.092	0.0834							
11-18-2009	12:38:17		2.1398	90.14	12.823	0.99	1.242	2.1398		
0.9014	1.2823	0.099	0.1242							
11-18-2009	12:39:18		2.1163	112.32	13.039	1.45	1.218	2.1163		
1.1232	1.3039	0.145	0.1218							
11-18-2009	12:40:17		1.9646	103.03	13.226	2.30	1.144	1.9646		
1.0303	1.3226	0.230	0.1144							
11-18-2009	12:41:17		1.9850	101.55	13.238	1.35	1.036	1.9850		
1.0155	1.3238	0.135	0.1036							
11-18-2009	12:42:17		1.9749	106.05	13.374	1.90	1.012	1.9749		
1.0605	1.3374	0.190	0.1012							
11-18-2009	12:43:17		1.9539	99.51	13.471	1.96	1.023	1.9539		
0.9951	1.3471	0.196	0.1023							
11-18-2009	12:44:18		1.9502	90.84	13.473	1.39	0.962	1.9502		
0.9084	1.3473	0.139	0.0962							
11-18-2009	12:45:17		1.9608	70.92	13.731	1.03	0.748	1.9608		
0.7092	1.3731	0.103	0.0748							
11-18-2009	12:46:18		1.9574	68.60	13.656	0.62	0.958	1.9574		
0.6860	1.3656	0.062	0.0958							
11-18-2009	12:47:17		2.0858	85.00	13.299	1.03	0.844	2.0858		
0.8500	1.3299	0.103	0.0844							
11-18-2009	12:48:18		2.1081	70.48	13.428	0.76	0.912	2.1081		
0.7048	1.3428	0.076	0.0912							
11-18-2009	12:49:17		2.0854	76.60	13.410	1.04	0.797	2.0854		
0.7660	1.3410	0.104	0.0797							
11-18-2009	12:50:17		2.0536	81.82	13.382	0.70	0.842	2.0536		
0.8182	1.3382	0.070	0.0842							
11-18-2009	12:51:17		2.0308	82.71	13.270	1.16	0.797	2.0308		
0.8271	1.3270	0.116	0.0797							
11-18-2009	12:52:17		2.0646	87.51	13.364	1.00	0.779	2.0646		
0.8751	1.3364	0.100	0.0779							
11-18-2009	12:53:18		2.1277	97.40	13.284	1.63	0.743	2.1277		
0.9740	1.3284	0.163	0.0743							
11-18-2009	12:54:17		2.0198	100.48	13.507	1.27	0.844	2.0198		
1.0048	1.3507	0.127	0.0844							
11-18-2009	12:55:18		1.8375	115.15	13.714	2.24	0.794	1.8375		
1.1515	1.3714	0.224	0.0794							
11-18-2009	12:56:17		1.8646	104.46	13.785	2.16	0.876	1.8646		
1.0446	1.3785	0.216	0.0876							
11-18-2009	12:57:18		2.0743	80.05	13.979	1.77	0.878	2.0743		
0.8005	1.3979	0.177	0.0878							
11-18-2009	12:58:17		2.4202	51.97	13.792	0.95	0.811	2.4202		
0.5197	1.3792	0.095	0.0811							
11-18-2009	12:59:17		3.0699	98.31	13.644	1.69	0.729	3.0699		
0.9831	1.3644	0.169	0.0729							
11-18-2009	13:00:17		2.8037	96.65	13.573	2.32	0.747	2.8037		
0.9665	1.3573	0.232	0.0747							
11-18-2009	13:01:17		2.8057	76.59	13.612	1.11	0.826	2.8057		

0.7659 1.3612	0.111 0.0826						
11-18-2009	13:02:18	2.8893	85.78	13.508	1.14	0.695	2.8893
0.8578 1.3508	0.114 0.0695						
11-18-2009	13:03:17	2.7887	123.84	13.392	1.76	0.777	2.7887
1.2384 1.3392	0.176 0.0777						
11-18-2009	13:04:18	2.7138	86.53	13.791	3.08	0.768	2.7138
0.8653 1.3791	0.308 0.0768						
11-18-2009	13:05:17	2.9104	87.53	13.703	1.63	0.744	2.9104
0.8753 1.3703	0.163 0.0744						
11-18-2009	13:06:18	3.0244	105.79	13.692	2.28	0.660	3.0244
1.0579 1.3692	0.228 0.0660						
11-18-2009	13:07:17	3.0275	103.13	13.626	1.67	0.760	3.0275
1.0313 1.3626	0.167 0.0760						
11-18-2009	13:08:17	2.9665	115.13	13.624	2.27	0.710	2.9665
1.1513 1.3624	0.227 0.0710						
11-18-2009	13:09:17	3.0265	113.15	13.701	2.36	0.677	3.0265
1.1315 1.3701	0.236 0.0677						
11-18-2009	13:10:17	2.9473	99.22	13.738	2.42	0.695	2.9473
0.9922 1.3738	0.242 0.0695						
11-18-2009	13:11:17	3.1021	81.11	13.525	1.55	0.628	3.1021
0.8111 1.3525	0.155 0.0628						
11-18-2009	13:12:17	3.1843	69.97	13.536	0.89	0.746	3.1843
0.6997 1.3536	0.089 0.0746						
11-18-2009	13:13:18	3.1729	88.42	13.335	0.99	0.777	3.1729
0.8842 1.3335	0.099 0.0777						
11-18-2009	13:14:17	3.1601	82.61	13.427	1.08	0.658	3.1601
0.8261 1.3427	0.108 0.0658						
11-18-2009	13:15:18	3.0853	110.06	13.315	1.38	0.788	3.0853
1.1006 1.3315	0.138 0.0788						
11-18-2009	13:16:17	3.0685	77.63	13.675	1.93	0.631	3.0685
0.7763 1.3675	0.193 0.0631						
11-18-2009	13:17:17	3.1045	80.65	13.447	1.12	0.725	3.1045
0.8065 1.3447	0.112 0.0725						
11-18-2009	13:18:17	3.1472	79.75	13.452	1.33	0.646	3.1472
0.7975 1.3452	0.133 0.0646						
11-18-2009	13:19:17	3.1379	90.64	13.537	1.39	0.759	3.1379
0.9064 1.3537	0.139 0.0759						
11-18-2009	13:20:18	3.0283	115.81	13.428	1.85	0.692	3.0283
1.1581 1.3428	0.185 0.0692						
11-18-2009	13:21:17	3.0366	109.65	13.657	2.42	0.812	3.0366
1.0965 1.3657	0.242 0.0812						
11-18-2009	13:22:18	2.9593	94.33	13.516	2.61	0.640	2.9593
0.9433 1.3516	0.261 0.0640						
11-18-2009	13:23:17	3.0855	79.21	13.542	1.60	0.712	3.0855
0.7921 1.3542	0.160 0.0712						
11-18-2009	13:24:18	3.0763	74.95	13.478	0.77	0.825	3.0763
0.7495 1.3478	0.077 0.0825						
11-18-2009	13:25:17	3.0513	88.17	13.402	1.46	0.727	3.0513
0.8817 1.3402	0.146 0.0727						
11-18-2009	13:26:17	3.1292	86.03	13.147	1.11	0.728	3.1292
0.8603 1.3147	0.111 0.0728						
11-18-2009	13:27:17	3.2397	97.73	13.256	0.89	0.778	3.2397
0.9773 1.3256	0.089 0.0778						
11-18-2009	13:28:17	3.1633	99.58	13.097	1.68	0.826	3.1633
0.9958 1.3097	0.168 0.0826						
11-18-2009	13:29:17	3.2347	93.67	13.269	1.41	0.676	3.2347
0.9367 1.3269	0.141 0.0676						
11-18-2009	13:30:17	3.2446	85.88	13.350	1.49	0.683	3.2446
0.8588 1.3350	0.149 0.0683						
11-18-2009	13:31:18	3.2206	84.15	13.553	0.55	0.831	3.2206
0.8415 1.3553	0.055 0.0831						
11-18-2009	13:32:17	3.0838	100.17	13.515	2.17	0.661	3.0838
1.0017 1.3515	0.217 0.0661						

11-18-2009	13:33:18	3.2358	87.68	13.429	1.99	0.713	3.2358
0.8768 1.3429	0.199 0.0713						
11-18-2009	13:34:17	3.2811	74.84	13.520	1.08	0.882	3.2811
0.7484 1.3520	0.108 0.0882						
11-18-2009	13:35:18	3.2020	104.38	13.501	1.21	0.748	3.2020
1.0438 1.3501	0.121 0.0748						
11-18-2009	13:36:17	3.0734	99.31	13.685	2.18	0.663	3.0734
0.9931 1.3685	0.218 0.0663						
11-18-2009	13:37:17	3.0182	94.51	13.798	1.56	0.824	3.0182
0.9451 1.3798	0.156 0.0824						
11-18-2009	13:38:17	3.2207	70.49	13.909	1.62	0.693	3.2207
0.7049 1.3909	0.162 0.0693						
11-18-2009	13:39:17	3.1658	82.16	13.690	0.90	0.712	3.1658
0.8216 1.3690	0.090 0.0712						
11-18-2009	13:40:18	3.1811	69.00	13.697	1.35	0.710	3.1811
0.6900 1.3697	0.135 0.0710						
11-18-2009	13:41:17	3.2035	84.08	13.533	0.70	0.692	3.2035
0.8408 1.3533	0.070 0.0692						
11-18-2009	13:42:18	3.2484	79.25	13.631	1.18	0.632	3.2484
0.7925 1.3631	0.118 0.0632						
11-18-2009	13:43:17	3.1699	93.81	13.557	1.33	0.801	3.1699
0.9381 1.3557	0.133 0.0801						
11-18-2009	13:44:18	3.1842	86.97	13.496	1.71	0.678	3.1842
0.8697 1.3496	0.171 0.0678						
11-18-2009	13:45:17	3.2637	92.90	13.304	1.53	0.709	3.2637
0.9290 1.3304	0.153 0.0709						
11-18-2009	13:46:17	3.2123	80.15	13.314	1.90	0.798	3.2123
0.8015 1.3314	0.190 0.0798						
11-18-2009	13:47:17	3.1449	86.62	13.178	0.84	0.718	3.1449
0.8662 1.3178	0.084 0.0718						
11-18-2009	13:48:17	3.1263	74.73	13.293	1.60	0.660	3.1263
0.7473 1.3293	0.160 0.0660						
11-18-2009	13:49:18	3.0939	72.74	13.200	1.10	0.725	3.0939
0.7274 1.3200	0.110 0.0725						
11-18-2009	13:50:17	3.1709	85.17	13.160	1.13	0.774	3.1709
0.8517 1.3160	0.113 0.0774						
11-18-2009	13:51:18	3.1104	107.20	13.185	1.52	0.757	3.1104
1.0720 1.3185	0.152 0.0757						
11-18-2009	13:52:17	2.9699	121.17	13.197	2.15	0.897	2.9699
1.2117 1.3197	0.215 0.0897						
11-18-2009	13:53:18	2.9426	117.40	13.575	2.82	0.867	2.9426
1.1740 1.3575	0.282 0.0867						
11-18-2009	13:54:17	2.9418	111.83	13.514	2.47	0.700	2.9418
1.1183 1.3514	0.247 0.0700						
11-18-2009	13:55:17	3.0041	107.32	13.636	2.49	0.711	3.0041
1.0732 1.3636	0.249 0.0711						
11-18-2009	13:56:17	2.9270	101.56	13.710	2.81	0.733	2.9270
1.0156 1.3710	0.281 0.0733						
11-18-2009	13:57:17	2.9840	103.38	13.685	1.99	0.742	2.9840
1.0338 1.3685	0.199 0.0742						
11-18-2009	13:58:18	2.9823	103.97	13.830	2.20	0.798	2.9823
1.0397 1.3830	0.220 0.0798						
11-18-2009	13:59:17	2.9446	103.58	13.711	2.44	0.660	2.9446
1.0358 1.3711	0.244 0.0660						
11-18-2009	14:00:18	3.0083	96.01	13.767	2.11	0.698	3.0083
0.9601 1.3767	0.211 0.0698						
11-18-2009	14:01:17	2.9500	82.17	13.714	1.56	0.733	2.9500
0.8217 1.3714	0.156 0.0733						
11-18-2009	14:02:18	3.1466	80.38	13.522	0.88	0.807	3.1466
0.8038 1.3522	0.088 0.0807						
11-18-2009	14:03:17	3.2159	88.46	13.468	1.15	0.722	3.2159
0.8846 1.3468	0.115 0.0722						
11-18-2009	14:04:17	3.1647	93.16	13.395	1.45	0.720	3.1647

0.9316 1.3395	0.145 0.0720						
11-18-2009	14:05:17	3.0562	72.19	13.645	1.57	0.753	3.0562
0.7219 1.3645	0.157 0.0753						
11-18-2009	14:06:17	3.1246	79.05	13.554	0.65	0.627	3.1246
0.7905 1.3554	0.065 0.0627						
11-18-2009	14:07:18	3.0937	70.28	13.678	1.35	0.786	3.0937
0.7028 1.3678	0.135 0.0786						
11-18-2009	14:08:17	3.0584	83.69	13.468	0.97	0.757	3.0584
0.8369 1.3468	0.097 0.0757						
11-18-2009	14:09:18	3.1086	96.58	13.482	1.51	0.816	3.1086
0.9658 1.3482	0.151 0.0816						
11-18-2009	14:10:17	3.0320	95.61	13.194	1.97	0.740	3.0320
0.9561 1.3194	0.197 0.0740						
11-18-2009	14:11:18	3.0849	101.79	13.416	1.47	0.756	3.0849
1.0179 1.3416	0.147 0.0756						
11-18-2009	14:12:17	3.0036	92.35	13.282	2.61	0.734	3.0036
0.9235 1.3282	0.261 0.0734						
11-18-2009	14:13:17	3.0597	103.20	13.154	1.20	0.844	3.0597
1.0320 1.3154	0.120 0.0844						
11-18-2009	14:14:17	3.0709	82.88	13.303	1.75	0.640	3.0709
0.8288 1.3303	0.175 0.0640						
11-18-2009	14:15:17	3.0443	100.37	13.036	1.28	0.768	3.0443
1.0037 1.3036	0.128 0.0768						
11-18-2009	14:16:18	3.1402	100.07	13.231	1.44	0.735	3.1402
1.0007 1.3231	0.144 0.0735						
11-18-2009	14:17:17	3.1395	99.76	13.233	1.85	0.853	3.1395
0.9976 1.3233	0.185 0.0853						
11-18-2009	14:18:18	3.1440	114.50	13.149	1.15	0.771	3.1440
1.1450 1.3149	0.115 0.0771						
11-18-2009	14:19:17	3.2479	116.83	13.233	1.50	0.763	3.2479
1.1683 1.3233	0.150 0.0763						
11-18-2009	14:20:18	3.2288	105.58	13.165	1.66	0.872	3.2288
1.0558 1.3165	0.166 0.0872						
11-18-2009	14:21:17	3.2085	106.82	13.198	1.01	0.678	3.2085
1.0682 1.3198	0.101 0.0678						
11-18-2009	14:22:18	3.2789	98.24	13.280	1.67	0.715	3.2789
0.9824 1.3280	0.167 0.0715						
11-18-2009	14:23:17	3.2752	121.06	13.299	0.68	0.774	3.2752
1.2106 1.3299	0.068 0.0774						
11-18-2009	14:24:17	3.1570	109.41	13.502	2.55	0.629	3.1570
1.0941 1.3502	0.255 0.0629						
11-18-2009	14:25:17	3.0845	114.65	13.714	2.14	0.587	3.0845
1.1465 1.3714	0.214 0.0587						
11-18-2009	14:26:17	3.0846	84.74	13.816	1.58	0.732	3.0846
0.8474 1.3816	0.158 0.0732						
11-18-2009	14:27:18	3.2474	88.05	13.550	1.18	0.512	3.2474
0.8805 1.3550	0.118 0.0512						
11-18-2009	14:28:17	3.2019	81.06	13.428	0.99	0.665	3.2019
0.8106 1.3428	0.099 0.0665						
11-18-2009	14:29:18	3.1919	77.95	13.678	1.26	0.698	3.1919
0.7795 1.3678	0.126 0.0698						
11-18-2009	14:30:17	3.1154	96.33	13.449	1.29	0.711	3.1154
0.9633 1.3449	0.129 0.0711						
11-18-2009	14:31:18	3.1428	111.49	13.546	2.33	0.709	3.1428
1.1149 1.3546	0.233 0.0709						
11-18-2009	14:32:17	2.8997	107.59	13.772	2.04	0.836	2.8997
1.0759 1.3772	0.204 0.0836						
11-18-2009	14:33:17	2.9691	103.94	13.592	1.59	0.847	2.9691
1.0394 1.3592	0.159 0.0847						
11-18-2009	14:34:17	3.1712	86.24	13.571	1.89	0.746	3.1712
0.8624 1.3571	0.189 0.0746						
11-18-2009	14:35:17	3.1367	105.58	13.519	1.60	0.818	3.1367
1.0558 1.3519	0.160 0.0818						

11-18-2009	14:36:18	3.0545	93.48	13.575	1.57	0.774	3.0545
0.9348 1.3575	0.157 0.0774						
11-18-2009	14:37:17	3.1431	93.75	13.597	1.90	0.712	3.1431
0.9375 1.3597	0.190 0.0712						
11-18-2009	14:38:18	3.2208	95.35	13.339	1.55	0.779	3.2208
0.9535 1.3339	0.155 0.0779						
11-18-2009	14:39:17	3.2910	101.62	13.425	1.24	0.627	3.2910
1.0162 1.3425	0.124 0.0627						
11-18-2009	14:40:18	3.1949	94.63	13.565	1.70	0.819	3.1949
0.9463 1.3565	0.170 0.0819						
11-18-2009	14:41:17	3.1425	83.59	13.457	1.32	0.714	3.1425
0.8359 1.3457	0.132 0.0714						
11-18-2009	14:42:17	3.1917	82.42	13.506	0.65	0.733	3.1917
0.8242 1.3506	0.065 0.0733						
11-18-2009	14:43:17	3.2011	92.63	13.679	0.91	0.757	3.2011
0.9263 1.3679	0.091 0.0757						
11-18-2009	14:44:17	3.0192	104.59	13.625	2.15	0.669	3.0192
1.0459 1.3625	0.215 0.0669						
11-18-2009	14:45:18	2.9896	87.00	13.757	1.70	0.828	2.9896
0.8700 1.3757	0.170 0.0828						
11-18-2009	14:46:17	3.0567	69.21	13.838	1.49	0.728	3.0567
0.6921 1.3838	0.149 0.0728						
11-18-2009	14:47:18	3.1662	80.67	13.562	0.71	0.696	3.1662
0.8067 1.3562	0.071 0.0696						
11-18-2009	14:48:17	3.1317	100.49	13.712	1.33	0.839	3.1317
1.0049 1.3712	0.133 0.0839						
11-18-2009	14:49:18	2.8992	89.14	13.738	2.32	0.739	2.8992
0.8914 1.3738	0.232 0.0739						
11-18-2009	14:50:17	3.1226	97.90	13.498	1.21	0.754	3.1226
0.9790 1.3498	0.121 0.0754						
11-18-2009	14:51:17	3.1623	84.89	13.615	1.92	0.747	3.1623
0.8489 1.3615	0.192 0.0747						
11-18-2009	14:52:17	3.0404	104.13	13.675	1.61	0.847	3.0404
1.0413 1.3675	0.161 0.0847						
11-18-2009	14:53:17	2.9609	77.34	14.056	1.49	0.762	2.9609
0.7734 1.4056	0.149 0.0762						
11-18-2009	14:54:18	3.0497	75.81	13.882	1.25	0.877	3.0497
0.7581 1.3882	0.125 0.0877						
11-18-2009	14:55:17	3.0898	101.13	13.734	1.30	0.711	3.0898
1.0113 1.3734	0.130 0.0711						
11-18-2009	14:56:18	3.1455	96.00	13.832	1.92	0.766	3.1455
0.9600 1.3832	0.192 0.0766						
11-18-2009	14:57:17	2.9561	103.51	13.914	2.01	0.690	2.9561
1.0351 1.3914	0.201 0.0690						
11-18-2009	14:58:18	2.9312	94.02	14.009	2.12	0.770	2.9312
0.9402 1.4009	0.212 0.0770						
11-18-2009	14:59:17	3.0426	86.35	14.039	1.53	0.797	3.0426
0.8635 1.4039	0.153 0.0797						
11-18-2009	15:00:17	3.0361	99.48	13.937	1.73	0.665	3.0361
0.9948 1.3937	0.173 0.0665						
11-18-2009	15:01:17	2.9704	94.12	14.027	1.72	0.808	2.9704
0.9412 1.4027	0.172 0.0808						
11-18-2009	15:02:17	3.0069	76.70	14.246	2.07	0.894	3.0069
0.7670 1.4246	0.207 0.0894						
11-18-2009	15:03:18	3.1637	78.12	13.808	1.13	0.829	3.1637
0.7812 1.3808	0.113 0.0829						
11-18-2009	15:04:17	3.4456	65.56	14.015	0.80	0.903	3.4456
0.6556 1.4015	0.080 0.0903						
11-18-2009	15:05:18	5.5288*	10.98	4.213	0.81	0.435	5.5288*
0.1098 0.4213	0.081 0.0435						
11-18-2009	15:06:17	1.1413	7.74	0.385	1.33	0.818	1.1413
0.0774 0.0385	0.133 0.0818						
11-18-2009	15:07:18	4.3863	7.53	0.367	2.00	0.121	4.3863

0.0753	0.0367	0.200	0.0121				
11-18-2009	15:08:17	0.1316	8.35	0.264	1.05	0.390	0.1316
0.0835	0.0264	0.105	0.0390				
11-18-2009	15:09:17	4.9511*	9.04	0.395	1.39	0.266	4.9511*
0.0904	0.0395	0.139	0.0266				
11-18-2009	15:10:17	5.4962*	102.12	10.042	2.29	0.010	5.4962*
1.0212	1.0042	0.229	0.0010				
11-18-2009	15:11:17	2.0551	96.87	13.721	1.93	0.294	2.0551
0.9687	1.3721	0.193	0.0294				
11-18-2009	15:12:17	1.8700	97.30	13.960	1.82	0.186	1.8700
0.9730	1.3960	0.182	0.0186				
11-18-2009	15:13:17	1.9226	103.34	13.899	1.97	0.212	1.9226
1.0334	1.3899	0.197	0.0212				
11-18-2009	15:14:18	1.9316	76.22	14.095	8.05	0.385	1.9316
0.7622	1.4095	0.805	0.0385				
Begin calculating run averages							
11-18-2009	15:16:03	1.9028	97.52	14.098	11.65	0.619	1.9028
0.9752	1.4098	1.165	0.0619				
11-18-2009	15:17:04	1.8770	77.90	14.224	2.40	0.719	1.8770
0.7790	1.4224	0.240	0.0719				
11-18-2009	15:18:03	1.9254	83.83	14.063	1.87	0.861	1.9254
0.8383	1.4063	0.187	0.0861				
11-18-2009	15:19:04	1.9920	71.65	13.835	2.03	0.797	1.9920
0.7165	1.3835	0.203	0.0797				
11-18-2009	15:20:03	1.9721	70.71	14.067	2.23	0.663	1.9721
0.7071	1.4067	0.223	0.0663				
11-18-2009	15:21:04	1.9737	82.01	13.849	1.96	0.744	1.9737
0.8201	1.3849	0.196	0.0744				
11-18-2009	15:22:03	1.9362	106.40	13.778	1.67	0.820	1.9362
1.0640	1.3778	0.167	0.0820				
11-18-2009	15:23:03	1.7774	108.30	14.056	2.00	0.778	1.7774
1.0830	1.4056	0.200	0.0778				
11-18-2009	15:24:03	1.8144	102.75	14.151	2.60	0.944	1.8144
1.0275	1.4151	0.260	0.0944				
11-18-2009	15:25:03	1.8349	102.82	14.048	2.24	0.826	1.8349
1.0282	1.4048	0.224	0.0826				
11-18-2009	15:26:04	1.8305	103.05	14.266	2.59	0.798	1.8305
1.0305	1.4266	0.259	0.0798				
11-18-2009	15:27:03	1.8470	100.91	14.096	2.86	0.854	1.8470
1.0091	1.4096	0.286	0.0854				
11-18-2009	15:28:04	1.8336	110.72	14.194	2.51	0.756	1.8336
1.1072	1.4194	0.251	0.0756				
11-18-2009	15:29:03	1.7700	105.49	14.395	2.74	0.849	1.7700
1.0549	1.4395	0.274	0.0849				
11-18-2009	15:30:04	1.7685	109.97	14.293	2.24	0.851	1.7685
1.0997	1.4293	0.224	0.0851				
11-18-2009	15:31:03	1.7862	106.02	14.296	2.69	0.853	1.7862
1.0602	1.4296	0.269	0.0853				
11-18-2009	15:32:03	1.8115	105.94	14.462	2.79	0.809	1.8115
1.0594	1.4462	0.279	0.0809				
11-18-2009	15:33:03	1.7798	104.12	14.379	2.26	0.881	1.7798
1.0412	1.4379	0.226	0.0881				
11-18-2009	15:34:03	1.8549	103.15	14.429	2.65	0.921	1.8549
1.0315	1.4429	0.265	0.0921				
11-18-2009	15:35:04	1.7941	110.80	14.493	2.62	0.838	1.7941
1.1080	1.4493	0.262	0.0838				
11-18-2009	15:36:03	1.8121	107.37	14.479	2.53	0.952	1.8121
1.0737	1.4479	0.253	0.0952				
11-18-2009	15:37:04	1.8013	108.78	14.349	2.99	0.872	1.8013
1.0878	1.4349	0.299	0.0872				
11-18-2009	15:38:03	1.8750	83.43	14.424	2.38	0.811	1.8750
0.8343	1.4424	0.238	0.0811				
11-18-2009	15:39:04	1.8090	80.43	14.365	1.98	0.821	1.8090

0.8043 1.4365	0.198 0.0821						
11-18-2009	15:40:03	1.9473	86.33	14.174	1.51	0.811	1.9473
0.8633 1.4174	0.151 0.0811						
11-18-2009	15:41:04	2.0256	69.84	14.095	1.51	0.629	2.0256
0.6984 1.4095	0.151 0.0629						
11-18-2009	15:42:03	1.9779	72.77	14.029	0.98	0.610	1.9779
0.7277 1.4029	0.098 0.0610						
11-18-2009	15:43:03	1.9762	65.99	14.126	1.42	0.806	1.9762
0.6599 1.4126	0.142 0.0806						
11-18-2009	15:44:04	1.9599	80.56	14.064	0.82	0.719	1.9599
0.8056 1.4064	0.082 0.0719						
11-18-2009	15:45:03	1.8946	93.84	14.015	1.67	0.821	1.8946
0.9384 1.4015	0.167 0.0821						
11-18-2009	15:46:04	1.8833	69.91	14.755	2.09	0.674	1.8833
0.6991 1.4755	0.209 0.0674						
11-18-2009	15:47:03	1.9463	80.76	14.260	3.04	0.872	1.9463
0.8076 1.4260	0.304 0.0872						
11-18-2009	15:48:04	1.9791	79.41	13.776	1.84	0.839	1.9791
0.7941 1.3776	0.184 0.0839						
11-18-2009	15:49:03	2.0341	75.25	13.809	1.66	1.184	2.0341
0.7525 1.3809	0.166 0.1184						
11-18-2009	15:50:03	2.0055	74.33	13.816	1.67	1.346	2.0055
0.7433 1.3816	0.167 0.1346						
11-18-2009	15:51:03	2.0359	68.43	13.725	1.38	1.091	2.0359
0.6843 1.3725	0.138 0.1091						
11-18-2009	15:52:03	2.0559	77.04	13.619	1.01	1.079	2.0559
0.7704 1.3619	0.101 0.1079						
11-18-2009	15:53:04	1.9950	95.89	13.648	1.41	1.145	1.9950
0.9589 1.3648	0.141 0.1145						
11-18-2009	15:54:03	2.0772	70.84	13.694	2.06	0.823	2.0772
0.7084 1.3694	0.206 0.0823						
11-18-2009	15:55:04	2.1317	67.91	13.682	0.72	0.872	2.1317
0.6791 1.3682	0.072 0.0872						
11-18-2009	15:56:03	2.0930	68.10	13.652	0.90	0.971	2.0930
0.6810 1.3652	0.090 0.0971						
11-18-2009	15:57:04	2.0856	70.02	13.751	0.98	0.879	2.0856
0.7002 1.3751	0.098 0.0879						
11-18-2009	15:58:03	2.0618	78.35	13.638	1.09	0.740	2.0618
0.7835 1.3638	0.109 0.0740						
11-18-2009	15:59:04	1.9783	87.89	13.658	1.33	0.786	1.9783
0.8789 1.3658	0.133 0.0786						
11-18-2009	16:00:03	1.9805	88.52	13.861	1.53	0.913	1.9805
0.8852 1.3861	0.153 0.0913						
11-18-2009	16:01:03	1.9708	87.88	13.928	1.62	0.796	1.9708
0.8788 1.3928	0.162 0.0796						
11-18-2009	16:02:04	1.9506	82.51	13.935	1.83	0.705	1.9506
0.8251 1.3935	0.183 0.0705						
11-18-2009	16:03:03	2.0234	82.57	13.843	1.39	0.744	2.0234
0.8257 1.3843	0.139 0.0744						
11-18-2009	16:04:04	1.9604	82.05	13.994	2.10	0.867	1.9604
0.8205 1.3994	0.210 0.0867						
11-18-2009	16:05:03	1.9641	84.38	13.923	1.40	0.844	1.9641
0.8438 1.3923	0.140 0.0844						
11-18-2009	16:06:04	1.9556	83.10	13.939	1.59	0.819	1.9556
0.8310 1.3939	0.159 0.0819						
11-18-2009	16:07:03	1.9528	76.67	14.064	1.24	0.832	1.9528
0.7667 1.4064	0.124 0.0832						
11-18-2009	16:08:04	1.9067	75.54	13.987	1.50	0.823	1.9067
0.7554 1.3987	0.150 0.0823						
11-18-2009	16:09:03	2.0140	75.13	14.003	1.66	0.771	2.0140
0.7513 1.4003	0.166 0.0771						
11-18-2009	16:10:03	1.9327	81.47	13.827	1.07	0.747	1.9327
0.8147 1.3827	0.107 0.0747						

RUN03

11-18-2009	16:11:03	1.9293	80.42	13.837	1.62	0.812	1.9293		
0.8042 1.3837	0.162 0.0812								
11-18-2009	16:12:03	1.9930	68.42	13.924	1.40	0.780	1.9930		
0.6842 1.3924	0.140 0.0780								
11-18-2009	16:13:04	1.9966	63.02	13.797	1.05	0.696	1.9966		
0.6302 1.3797	0.105 0.0696								
11-18-2009	16:14:03	2.0635	56.60	13.679	0.76	0.706	2.0635		
0.5660 1.3679	0.076 0.0706								
11-18-2009	16:15:04	2.0447	62.80	13.612	0.67	0.537	2.0447		
0.6280 1.3612	0.067 0.0537								
Average of Test	Run	O2	CO	NOx	THC	SO2	O2	CO	
NOx THC	SO2								
	% ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	
ppm									
11-18-2009	16:15:04	1.9360	85.14	14.021	1.97	0.829	1.9360		
0.8514 1.4021	0.197 0.0829								
Test Run 3 End									

A45

FBIAS03

Final System Bias Check for Run 3 . STRATA Version 2.0

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts Volts
11-18-2009	16:16:10		1.9680	49.63	12.552	0.60	0.641	1.9680	0.4963 1.2552
		0.060	0.0641						
11-18-2009	16:17:10		0.0403	7.39	0.892	7.11	0.687	0.0403	0.0739 0.0892
		0.711	0.0687						
11-18-2009	16:18:10		0.0976	11.42	0.305	0.16	0.618	0.0976	0.1142 0.0305
		0.016	0.0618						
11-18-2009	16:19:10		0.1053	14.10	0.252	0.38	0.612	0.1053	0.1410 0.0252
		0.038	0.0612						
11-18-2009	16:20:09		3.6291	13.68	0.251	3.99	0.261	3.6291	0.1368 0.0251
		0.399	0.0261						
11-18-2009	16:21:10		4.9367	13.75	0.252	2.01	-0.373	4.9367	0.1375 0.0252
		0.201	-0.0373						
11-18-2009	16:22:09		4.9368	13.93	0.221	2.64	-0.240	4.9368	0.1393 0.0221
		0.264	-0.0240						
11-18-2009	16:23:10		4.9358	14.24	0.152	20.37	-0.363	4.9358	0.1424 0.0152
		2.037	-0.0363						
11-18-2009	16:24:10		4.9385	13.80	0.154	51.50	-0.283	4.9385	0.1380 0.0154
		5.150	-0.0283						
11-18-2009	16:25:10		4.5691	35.18	0.152	12.31	-0.401	4.5691	0.3518 0.0152
		1.231	-0.0401						
11-18-2009	16:26:10		-0.0017	132.19	0.148	2.97	0.155	-0.0017	1.3219 0.0148
		0.297	0.0155						
11-18-2009	16:27:10		0.0571	121.73	0.148	2.47	0.057	0.0571	1.2173 0.0148
		0.247	0.0057						
11-18-2009	16:28:10		0.0586	15.41	17.888	2.50	0.762	0.0586	0.1541 1.7888
		0.250	0.0762						
11-18-2009	16:29:10		0.0228	14.64	24.647	2.53	1.146	0.0228	0.1464 2.4647
		0.253	0.1146						
11-18-2009	16:30:10		0.7472	14.75	23.993	2.55	0.967	0.7472	0.1475 2.3993
		0.255	0.0967						
11-18-2009	16:31:09		9.9747	15.17	6.002	2.54	0.980	9.9747	0.1517 0.6002
		0.254	0.0980						
11-18-2009	16:32:10		12.9857	22.60	0.570	2.57	22.254	12.9857	0.2260 0.0570
		0.257	2.2254						
11-18-2009	16:33:09		13.1607	23.56	0.553	2.58	7.332	13.1607	0.2356 0.0553
		0.258	0.7332						
11-18-2009	16:34:10		13.1607	23.83	0.605	2.58	17.739	13.1607	0.2383 0.0605
		0.258	1.7739						

Final System Bias Check for Run 3

Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	Reference Cylinder Numbers	
	Zero	Span
O2	N2	cc9824
CO	N2	ALM014290
NOx	N2	cc241846
THC	AIR	cc236179
SO2	N2	cc144163

Date/Time 11-18-2009 16:34:59 PASSED

Analyte	O2	CO	NOx	THC	SO2
Units	%	ppm	ppm	ppm	ppm
Zero Ref Cyl	0.0000	0.00	0.000	0.00	0.000
Zero Cal	0.1396	2.22	0.038	0.46	0.171
Zero Avg	0.1019	14.04	0.265	0.12	0.601
Zero Bias%	0.4	4.0	0.4	0.3	0.9

			FBIAS03		
Zero Drift%	-0.6	-0.7	-0.1	0.1	-0.6
Span Ref Cyl	4.9400	132.00	24.600	52.60	22.200
Span Cal	4.9706	133.21	24.683	52.73	22.126
Span Avg	4.9375	131.90	24.618	51.28	22.043
Span Bias%	0.3	0.4	0.1	1.4	0.2
Span Drift%	-0.2	-0.6	0.1	-0.3	-1.3
Ini Zero Avg	0.1593	16.14	0.313	0.01	0.872
Ini Span Avg	4.9520	133.58	24.543	51.60	22.653
Run Avg 1.9360	85.14	14.021	1.97	0.829	
Co 0.1306	15.09	0.289	0.07	0.736	
Cm 4.9447	132.74	24.581	51.44	22.348	
Correct Avg	1.8526	78.60	13.906	1.95	0.095

RUN02

Test Run 2 Begin. STRATA Version 2.0
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts	Volts
11-17-2009	16:26:15		3.1704	57.68	0.227	1.06	22.839	3.1704	0.5768	0.0227
11-17-2009	16:27:16		4.8172	62.53	21.972	0.58	22.889	4.8172	0.6253	2.1972
11-17-2009	16:28:15		8.7625	58.90	40.230	0.75	22.772	8.7625	0.5890	4.0230
11-17-2009	16:29:16		11.0774	59.12	42.548	0.74	22.836	11.0774	0.5912	4.2548
11-17-2009	16:30:15		12.2621	58.36	49.508	0.97	22.609	12.2621	0.5836	4.9508
11-17-2009	16:31:15		12.7904	62.50	51.089	1.25	3.918	12.7904	0.6250	5.1089
	0.125	0.3918								

A48

RUN04

Test Run 4 Begin. STRATA Version 2.0
Operator: JMM
Plant Name: Conoco
Location: Old Ocean, TX

	O2	CO	NOx	THC	SO2	O2	CO	NOx	THC	SO2
	%	ppm	ppm	ppm	ppm	Volts	Volts	Volts	Volts	Volts
11-18-2009	16:36:00		13.1607*		23.81	0.340	2.55	15.404		
13.1607*	0.2381	0.0340	0.255	1.5404						
11-18-2009	16:37:00		13.1607*		20.50	0.054	2.54	-0.098		
13.1607*	0.2050	0.0054	0.254	-0.0098						
11-18-2009	16:38:00		13.1485*		20.47	0.056	2.52	-0.589		
13.1485*	0.2047	0.0056	0.252	-0.0589						
11-18-2009	16:39:00		12.9550*		20.42	5.395	2.52	-0.514		
12.9550*	0.2042	0.5395	0.252	-0.0514						
11-18-2009	16:40:00		13.1609*		22.39	9.899	2.53	-0.693		
13.1609*	0.2239	0.9899	0.253	-0.0693						
11-18-2009	16:41:00		13.1609*		22.76	37.278	2.53	-0.556		
13.1609*	0.2276	3.7278	0.253	-0.0556						
11-18-2009	16:41:59		13.1609*		19.98	45.028	2.16	-0.683		
13.1609*	0.1998	4.5028	0.216	-0.0683						
11-18-2009	16:43:00		13.1609*		19.12	49.445	-2.17	-0.602		
13.1609*	0.1912	4.9445	-0.217	-0.0602						
11-18-2009	16:43:59		13.1609*		19.18	50.488	-4.56	-0.639		
13.1609*	0.1918	5.0488	-0.456	-0.0639						
11-18-2009	16:45:00		13.1609*		19.17	50.269	-4.56	-0.672		
13.1609*	0.1917	5.0269	-0.456	-0.0672						

APPENDIX B.

LABORATORY ANALYSES

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Particulate Beaker Tare Weights

Initial Weight

Beaker Number:	2078	2079	2080	2081	2083	2084	2085
1	92.7036	99.1371	98.4559	101.1250	97.7793	100.1572	100.7440
2	92.7041	99.1370	98.4557	101.1246	97.7798	100.1573	100.7444
3							
4							
5							
Average (g)	92.7039	99.1371	98.4558	101.1248	97.7796	100.1573	100.7442

Final Weight

	2078	2079	2080	2081	2083	2084	2085
1	92.7113	99.1393	98.4660	101.1268	97.7843	100.1611	100.7529
2	92.7108	99.1390	98.4658	101.1265	97.7847	100.1616	100.7531
3							
4							
5							
Average (g)	92.7111	99.1392	98.4659	101.1267	97.7845	100.1614	100.7530

Total Weight Gain

	2078	2079	2080	2081	2083	2084	2085
Difference (g)	0.0072	0.0021	0.0101	0.0019	0.0050	0.0041	0.0088
Total PM (mg)	7.2	2.1	10.1	1.9	5.0	4.1	8.8

Plant Name	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company
Location	Old Ocean, Tx	Old Ocean, Tx	Old Ocean, Tx	Old Ocean, Tx	Old Ocean, Tx	Old Ocean, Tx	Old Ocean, Tx
Unit	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator
ID	Test 3 Impinger 1/BHW	Test 1 FHW	Test 1 Impinger 1/BHW	DI Blank 100mL	Test 2 Impinger 1/BHW	Test 2 FHW	Test 3 FHW
Test Date	11/18/09	11/17/09	11/17/09	11/18/09	11/18/09	11/18/09	11/18/09

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Particulate Filter Tare Weights

Initial Weight

Filter ID	1127	1110	1144	1141
1	0.7957	0.6988	0.7960	0.6085
2	0.7961	0.6991	0.7963	0.6085
3				
4				
5				
Average (g)	0.7959	0.6990	0.7962	0.6085

Final Weight

Filter ID	1127	1110	1144	1141
1	0.8007	0.7049	0.8002	0.6085
2	0.8009	0.7044	0.8004	0.6085
3				
4				
5				
Average (g)	0.8008	0.7047	0.8003	0.6085

Total Weight Gain

	1127	1110	1144	1141
Difference (g)	0.0049	0.0057	0.0041	0.0000
Total corrected for blank (g)	0.0049	0.0057	0.0041	0.0000
Total PM (mg)	4.9	5.7	4.1	0.0

Plant Name	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company	ConocoPhillips Company
Location	Old Ocean, TX	Old Ocean, TX	Old Ocean, TX	Old Ocean, TX
Unit	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator	Unit 39.1 Tail Gas Incinerator
ID	Test 1	Test 2	Test 3	Blank
Test Date	11/17/09	11/18/09	11/18/09	11/17/09

GC VOC Analysis

Pre-Calibration Standards
(EPA Method 18)

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Chromatography Data Sheet

Gas Chromatograph Information

GC Type:	Shimadzu GC-14A		
Detector:	Flame Ionization Detector (FID).	Channel:	A & B
GC ID #:	1	DAS:	Shimadzu EZChrom
GC Serial #:	C10893500574SA		
Column Type:	6' x 1/8" stainless steel column packed with Hayesep Q polymer (80/100 mesh).		

Gas Chromatograph Operating Parameters

GC Oven Temperature Parameters:

Isothermal Column Temperature (C):	na	Injector Temperature (C):	220
Initial Column Temperature (C):	75	Detector Temperature (C):	220
Duration of initial temperature (min):	5.0	TCD Oven Temperature (C)	na
Program Rate (C/min):	15	Methanizer Temperature (C)	na
Final Temperature (C):	175		
Final Time (min):	18		
Carrier Gas Mass Flow Setting (Kpa):	100	Carrier Gas Type:	Nitrogen
Air Flow (Kpa):	50	Hydrogen Flow (Kpa)	50
Detector Range:	1	Back-flush Time (min):	NA
Sample Size (ul):	250	TCD Bridge Current (mA):	NA

Calibration Data

ID	Reten Time (min)	ID Time Band (+/- min)	Range	Regression Data: y = mx + b Where: x = Area & y = molar ppm m	b	r
VOC.						

* See Data Calculations Section

B4

AIR LIQUIDE
Scott Specialty Gases
Air Liquide America Specialty Gases LLC

9810 BAY AREA BLVD, PASADENA, TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

CUSTOM CLASS

CERTIFICATE OF ACCURACY: Custom Class Calibration Standard

Product Information
Project No.: 04-64960-002
Item No.: 0402B700100ZAL
P.O. No.: 52180

Cylinder Number: ALM066814
Cylinder Size: AL
Certification Date: 29May2008
Expiration Date: 29May2010

Customer

ENTECH ENGINEERING INC.
ROBERT STENBERG
100 EAST NASA ROAD ONE
SUITE 407
WEBSTER, TX 77598

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
N-BUTANE	15.2	PPM	2
ETHANE	15.6	PPM	2
N-HEXANE	15.5	PPM	2
METHANE	16.2	PPM	2
N-PENTANE	14.7	PPM	2
PROPANE	15.8	PPM	2
NITROGEN		BALANCE	

TRACEABILITY

Description	Traceability Type	Traceable To
ANALYTICAL TRACEABILITY	GAS STANDARDS	

APPROVED BY: Crissa Martin
CRISSA MARTIN

DATE: 05/29/08

ES

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

CUSTOM CLASS

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: Custom Class Calibration Standard

Product Information
Project No.: 04-64960-001
Item No.: 0402B700101ZAL
P.O. No.: 52180

Cylinder Number: ALM031355
Cylinder Size: AL
Certification Date: 29May2008
Expiration Date: 29May2010

Customer

ENTECH ENGINEERING INC.
ROBERT STENBERG
100 EAST NASA ROAD ONE
SUITE 407
WEBSTER, TX 77598

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
N-BUTANE	101.	PPM	2
ETHANE	101.	PPM	2
N-HEXANE	96.	PPM	2
METHANE	95.	PPM	2
N-PENTANE	97.	PPM	2
PROPANE	97.	PPM	2
NITROGEN		BALANCE	

TRACEABILITY

Description	Traceability Type	Traceable To
ANALYTICAL TRACEABILITY	GAS STANDARDS	SRS, NIST

APPROVED BY: CRISSA MARTIN

DATE: 05/29/08

B6

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

CUSTOM CLASS

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: Custom Class Calibration Standard

Product Information
Project No.: 04-64960-003
Item No.: 0402B700101ZAL
P.O. No.: 52180

Cylinder Number: ALM043423
Cylinder Size: AL
Certification Date: 29May2008
Expiration Date: 28May2010

Customer

ENTECH ENGINEERING INC.
ROBERT STENBERG
100 EAST NASA ROAD ONE
SUITE 407
WEBSTER, TX 77598

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
N-BUTANE	1,010.	PPM	2
ETHANE	1,010.	PPM	2
N-HEXANE	980.	PPM	2
METHANE	1,020.	PPM	2
N-PENTANE	990.	PPM	2
PROPANE	1,000.	PPM	2
NITROGEN		BALANCE	

TRACEABILITY

Description	Traceability Type	Traceable To
ANALYTICAL TRACEABILITY	GAS STANDARDS	SRS

APPROVED BY: CRISSA MARTIN

DATE: 05/29/08

B7

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data

GC #1 FID-2 (Range 1)

Methane Standard (ALM066814; ALM031355; ALM043423)

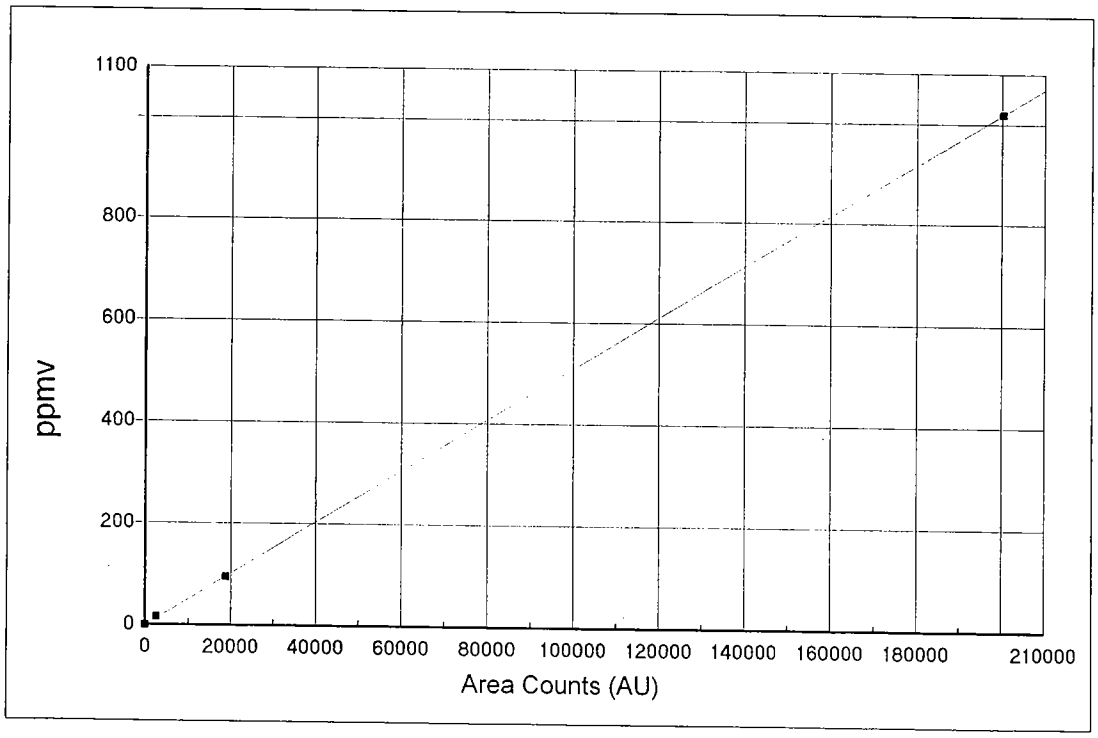
08/27/09

(Retention Time = 1.062 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.0	0	0	0	0.0	NA
16.2	2641	2644	2618	2634.3	0.25%
95.0	19034	18757	18565	18785.3	1.32%
1020.0	200507	197983	202325	200271.7	0.12%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	1.653
R Squared	0.999989
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	5.092950E-03
Std Err of Coef.	8.218916E-06



Operator km Date Sep 01, 2009

BS

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data

GC #1 FID-2 (Range 1)

Ethane Standard (ALM066814; ALM031355; ALM043423)

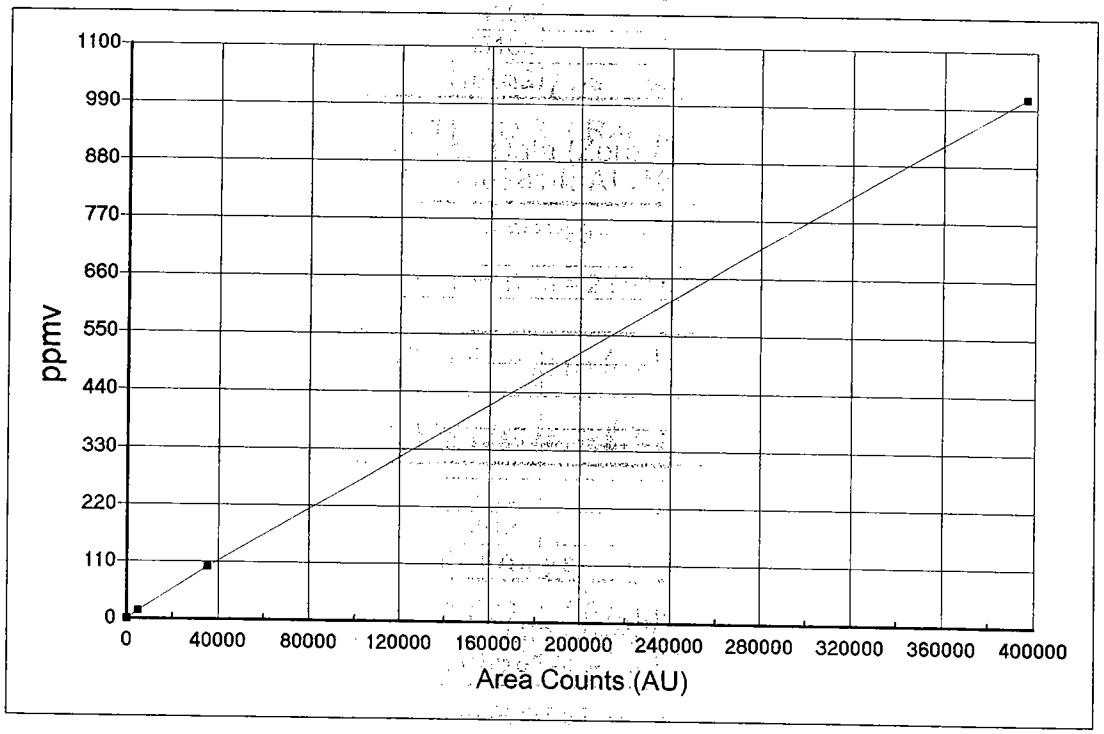
08/27/09

(Retention Time = 2.990 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.0	0	0	0	0.0	NA
15.6	4860	4898	4841	4866.3	0.13%
101.0	35725	35188	34838	35250.3	1.35%
1010.0	395934	391092	400509	395845.0	0.02%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	6.618
R Squared	0.999816
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.554070E-03
Std Err of Coef.	1.665118E-05

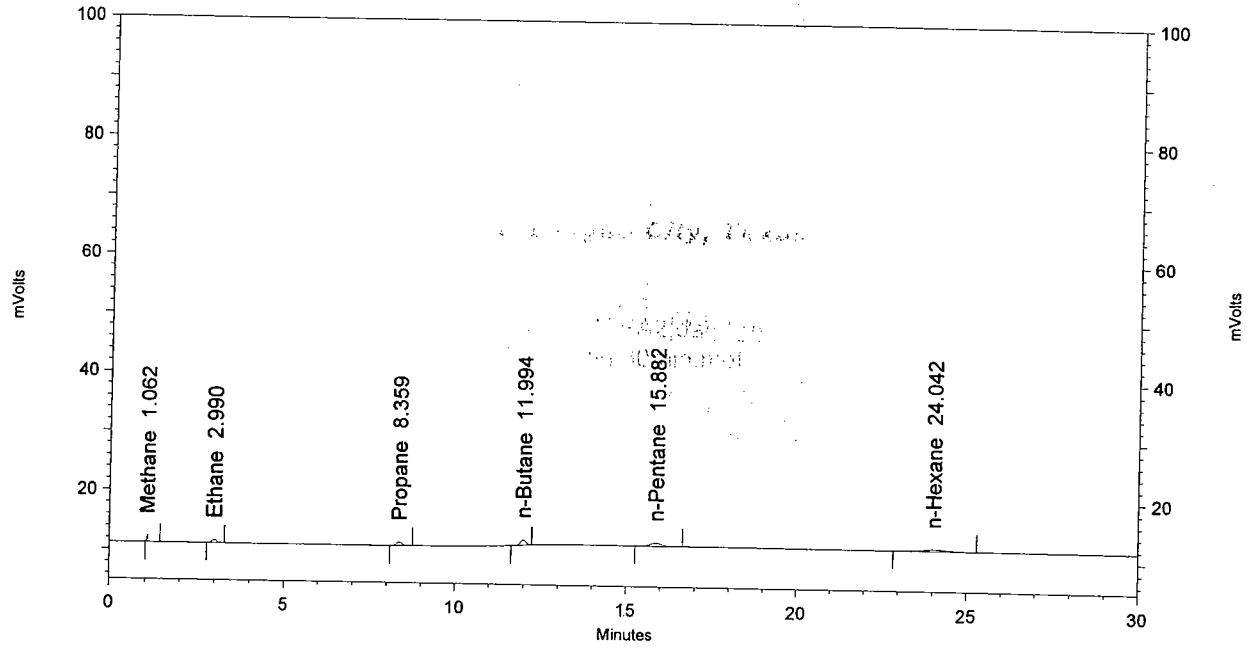


Operator km Date Sep 01, 2009

89

Entech Engineering Inc. League City, Texas

SAMPLE ID: 15 PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\15PA2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:26:45 AM
PRINTED: 9/1/2009 8:26:50 AM
USER: System

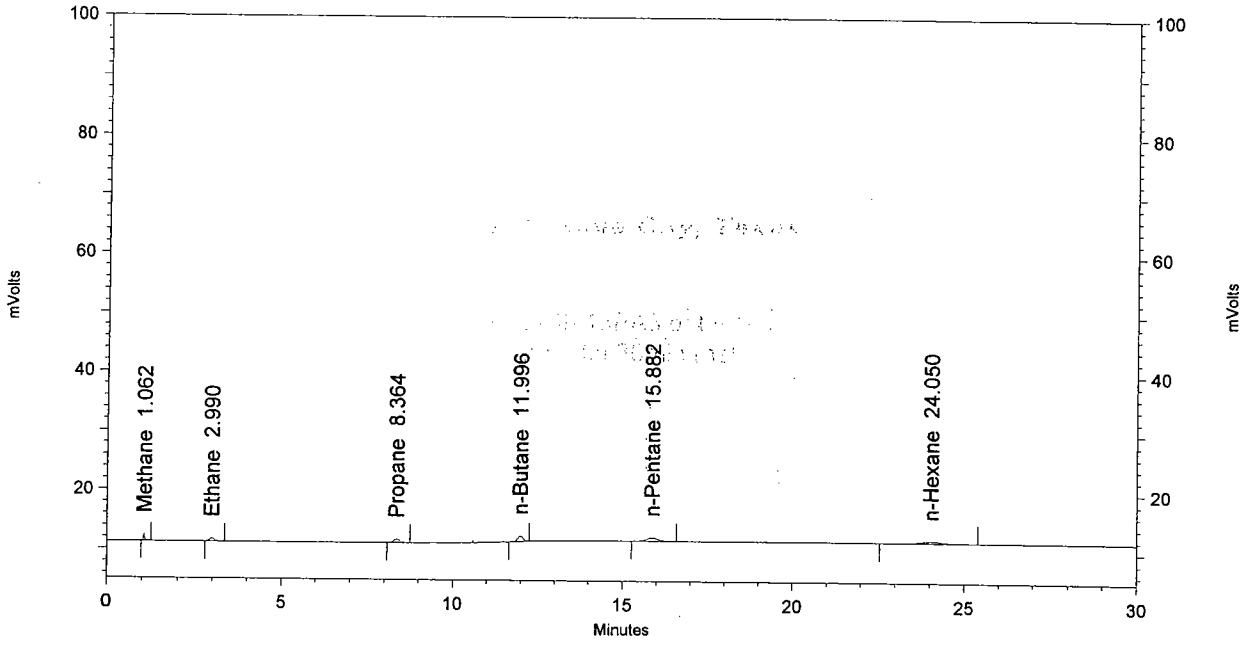


FID-2 Results

Name	Retention Time	Area
Methane	1.062	2641
Ethane	2.990	4860
Propane	8.359	7191
n-Butane	11.994	10212
n-Pentane	15.882	12994
n-Hexane	24.042	15659
Totals		53557

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 15 PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\15PA3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 8/31/2009 6:00:57 PM
PRINTED: 9/1/2009 8:27:00 AM
USER: System

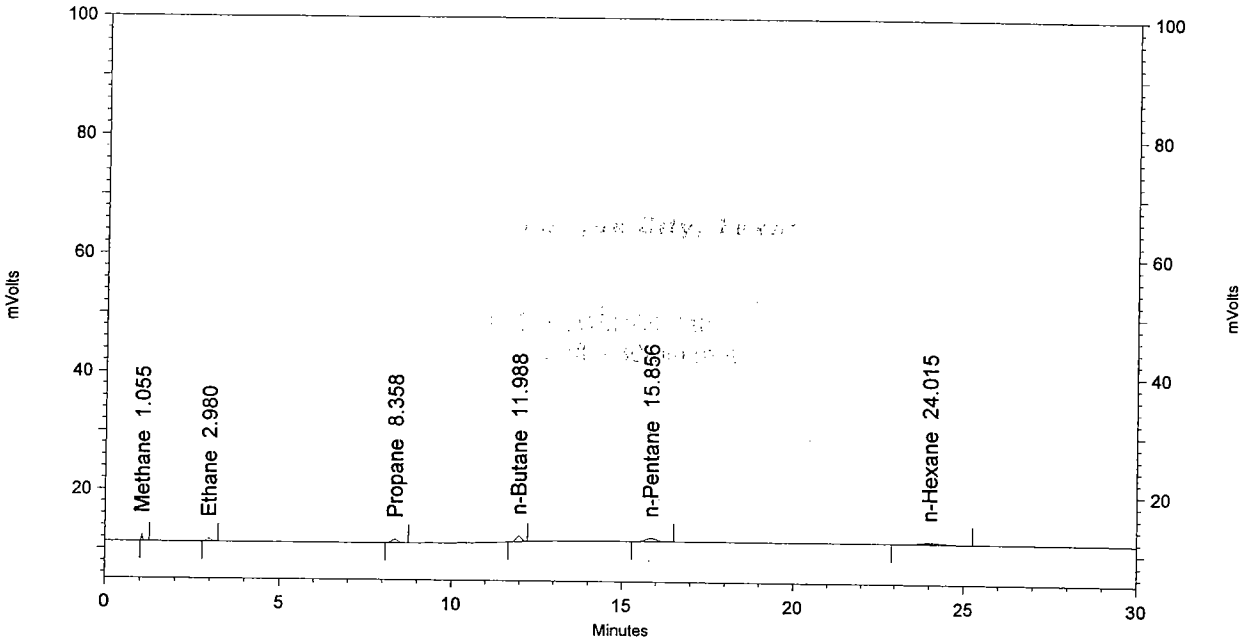


FID-2 Results

Name	Retention Time	Area
Methane	1.062	2644
Ethane	2.990	4898
Propane	8.364	7210
n-Butane	11.996	10263
n-Pentane	15.882	13078
n-Hexane	24.050	15845
Totals		53938

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 15 PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\15PA4.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:27:10 AM
PRINTED: 9/1/2009 8:27:14 AM
USER: System



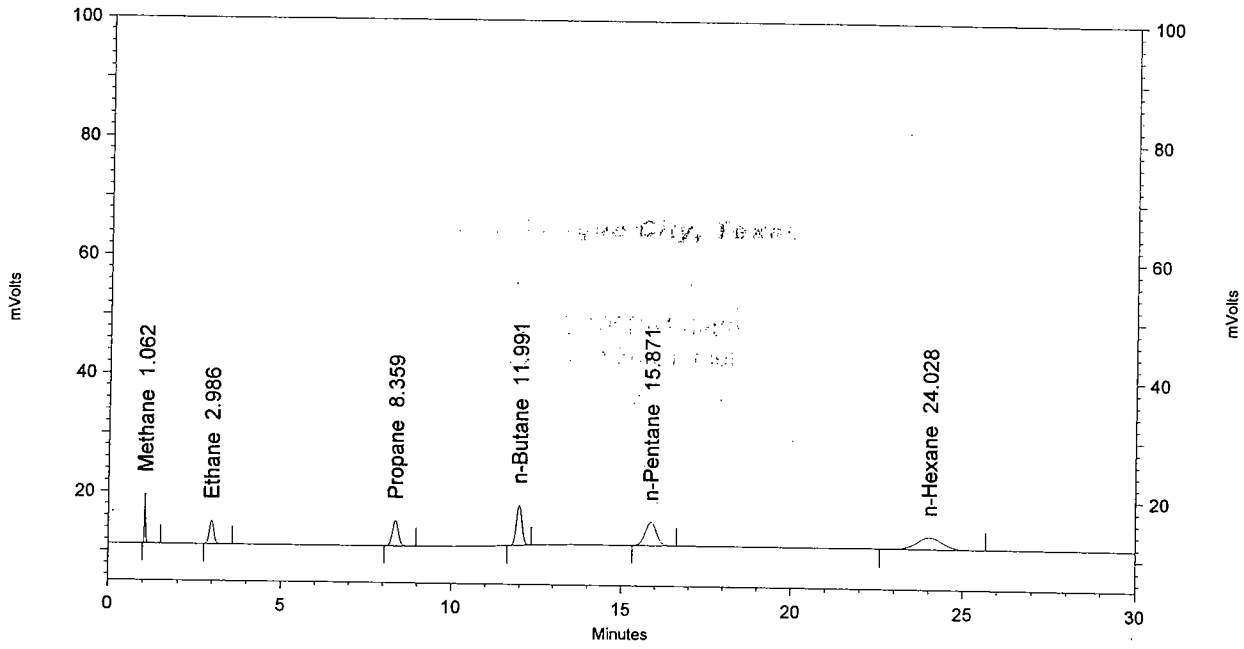
FID-2 Results

Name	Retention Time	Area
Methane	1.055	2618
Ethane	2.980	4841
Propane	8.358	7237
n-Butane	11.988	10123
n-Pentane	15.856	12926
n-Hexane	24.015	15678
Totals		53423

B12

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 100PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\100PA1.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:27:43 AM
PRINTED: 9/1/2009 8:27:48 AM
USER: System

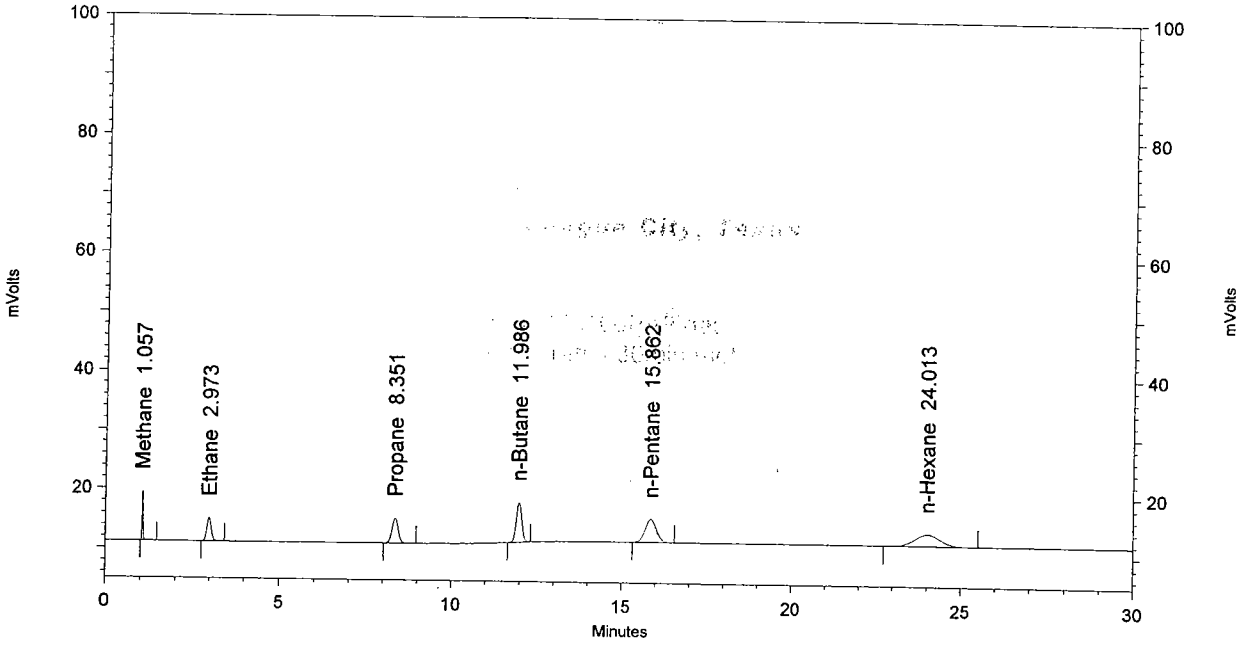


FID-2 Results

Name	Retention Time	Area
Methane	1.062	19034
Ethane	2.986	35725
Propane	8.359	52661
n-Butane	11.991	74462
n-Pentane	15.871	91881
n-Hexane	24.028	106642
Totals		380405

Entech Engineering Inc. League City, Texas

SAMPLE ID: 100PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\100PA2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:27:59 AM
PRINTED: 9/1/2009 8:28:02 AM
USER: System



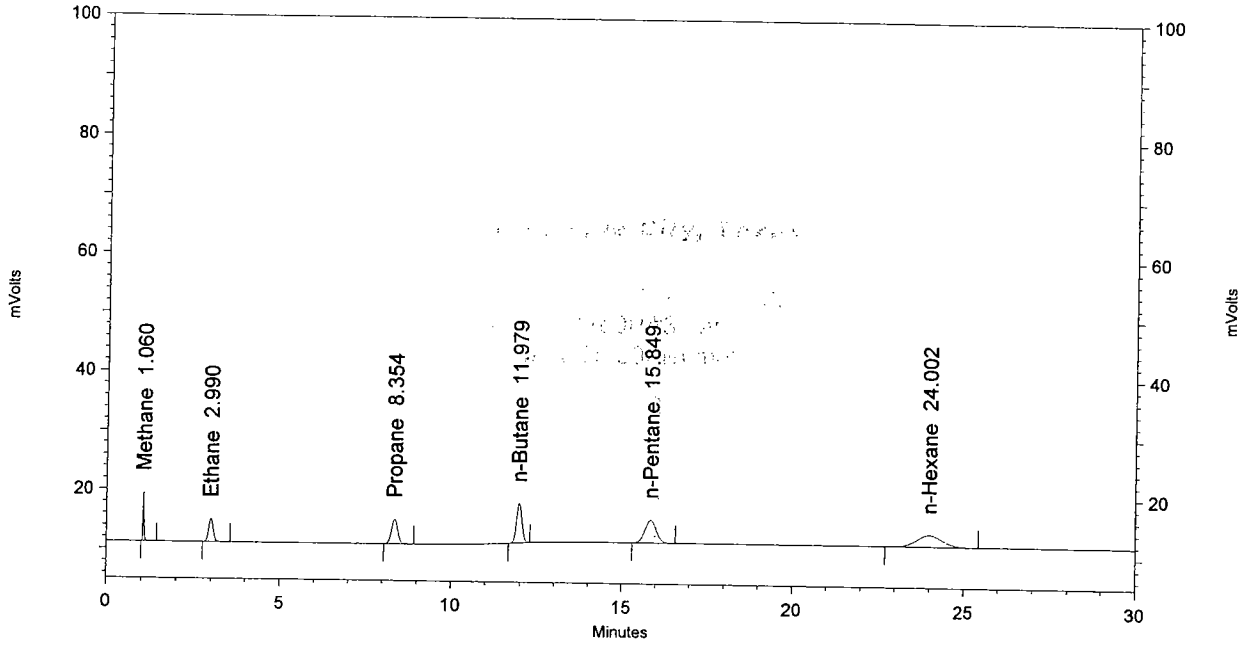
FID-2 Results

Name	Retention Time	Area
Methane	1.057	18757
Ethane	2.973	35188
Propane	8.351	51943
n-Butane	11.986	73465
n-Pentane	15.862	90786
n-Hexane	24.013	105449
Totals		375588

B14

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 100PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\100PA3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:28:25 AM
PRINTED: 9/1/2009 8:28:27 AM
USER: System



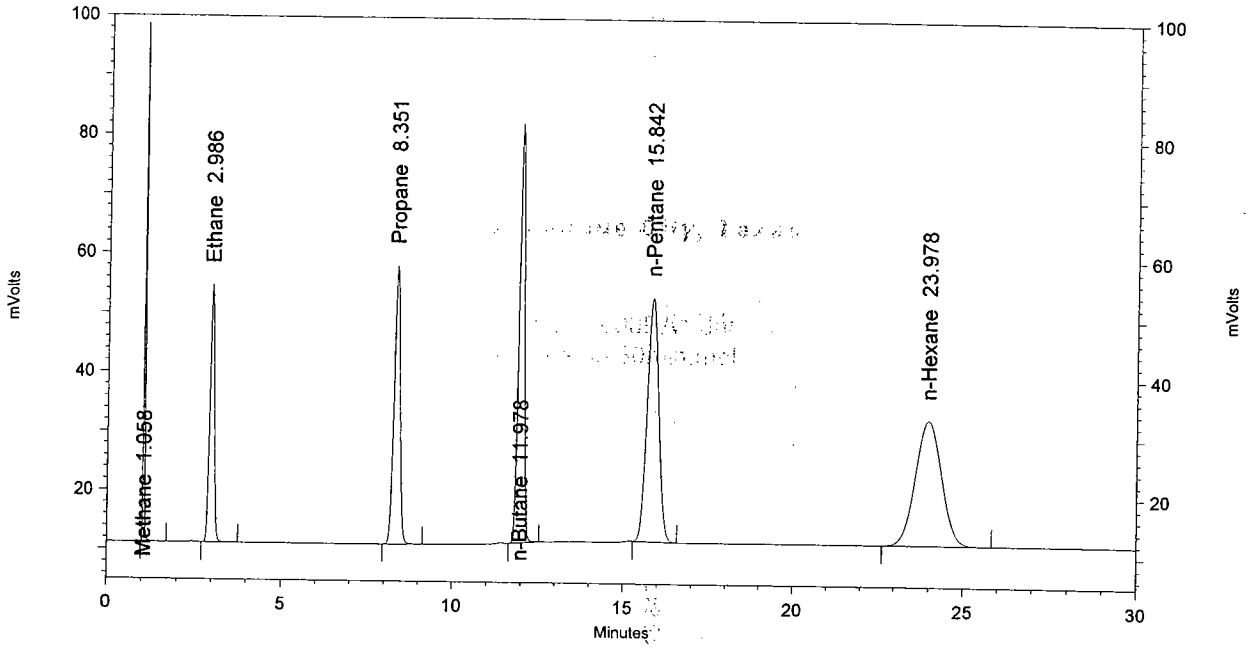
FID-2 Results

Name	Retention Time	Area
Methane	1.060	18565
Ethane	2.990	34838
Propane	8.354	51231
n-Butane	11.979	72588
n-Pentane	15.849	90012
n-Hexane	24.002	104695
Totals		371929

B15

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 1000PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\1000PA1.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:28:37 AM
PRINTED: 9/1/2009 8:28:40 AM
USER: System

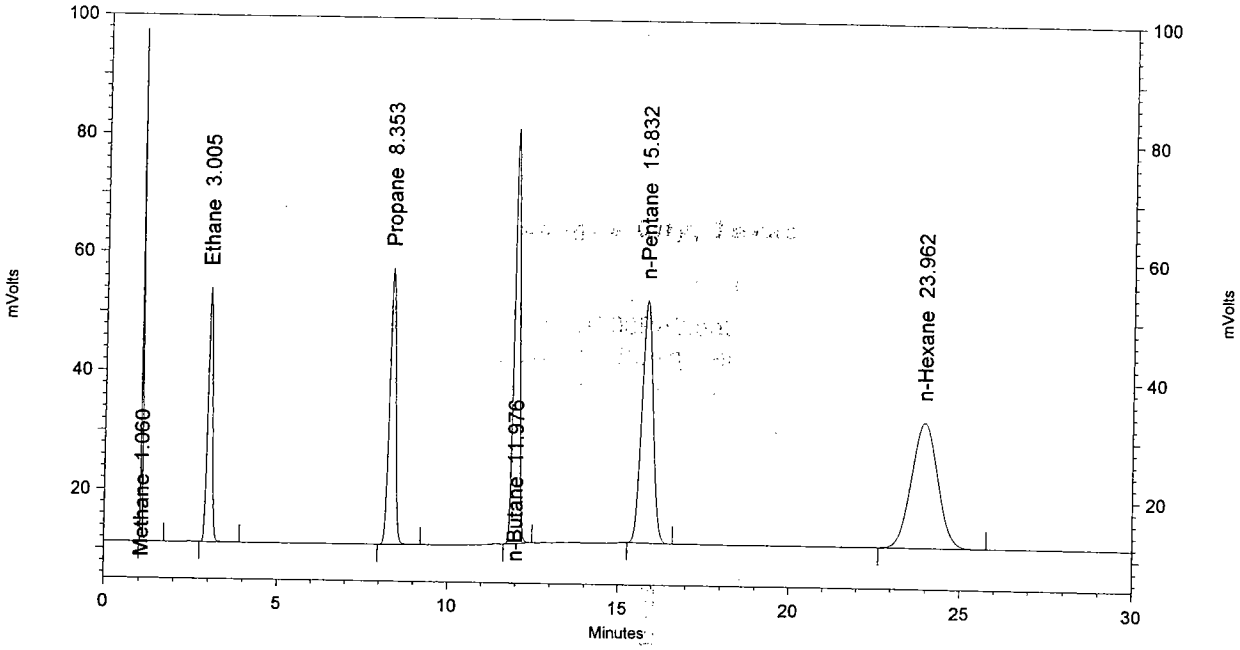


FID-2 Results

Name	Retention Time	Area
Methane	1.058	200507
Ethane	2.986	395934
Propane	8.351	587622
n-Butane	11.978	784763
n-Pentane	15.842	961837
n-Hexane	23.978	1118892
Totals		4049555

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 1000PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\1000PA2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:28:51 AM
PRINTED: 9/1/2009 8:28:53 AM
USER: System

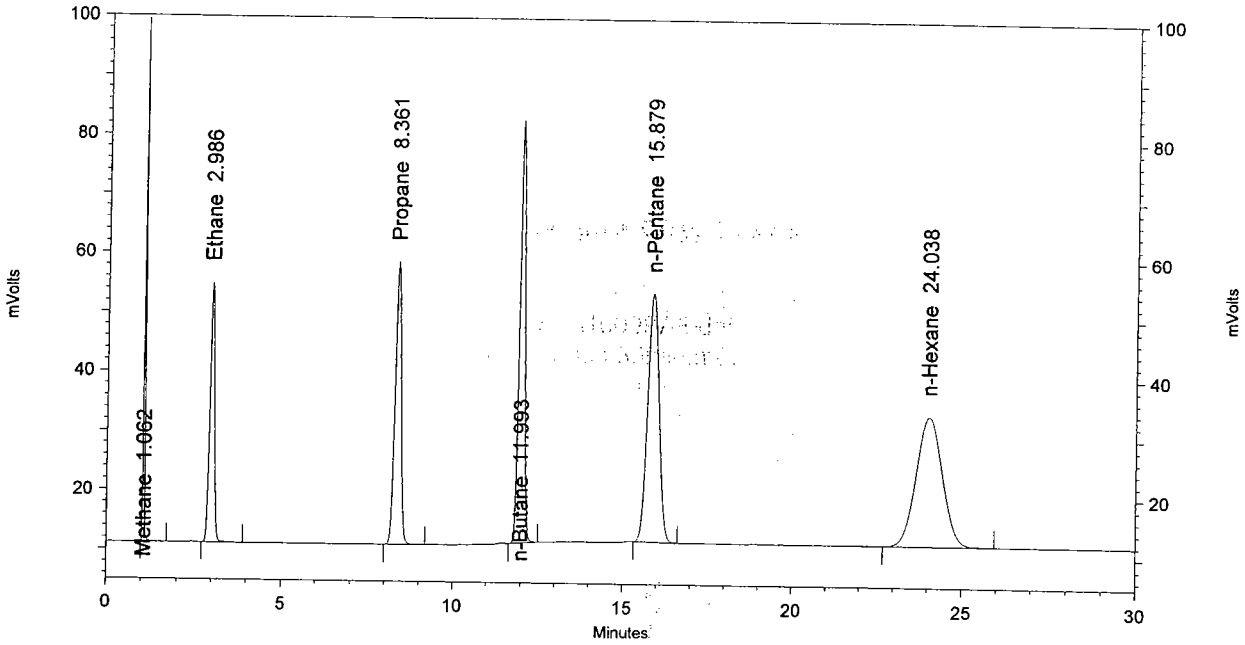


FID-2 Results

Name	Retention Time	Area
Methane	1.060	197983
Ethane	3.005	391092
Propane	8.353	580256
n-Butane	11.976	775704
n-Pentane	15.832	953281
n-Hexane	23.962	1115965
Totals		4014281

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 1000PPM PARAFFIN
FILE: E:\Calibration\GC#1\ICL082709\1000PA3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/1/2009 8:29:01 AM
PRINTED: 9/1/2009 8:29:04 AM
USER: System



FID-2 Results

Name	Retention Time	Area
Methane	1.062	202325
Ethane	2.986	400509
Propane	8.361	595947
n-Butane	11.993	797032
n-Pentane	15.879	980913
n-Hexane	24.038	1152943
Totals		4129669

GC VOC Analysis

Post-Calibration Standards
(EPA Method 18)

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC #1 FID (Channel B@Range 1) - Initial Calibration: August 27, 2009
Paraffin Standards Post Check Result
11/20/09

Sample ID No.	GC Run No.	Area Counts Methane area counts	Concentration Methane ppmv	Area Counts Ethane area counts	Concentration Ethane ppmv	Area Counts Propane area counts	Concentration Propane ppmv	Area Counts n-Butane area counts	Concentration n-Butane ppmv	Area Counts n-Pentane area counts	Concentration n-Pentane ppmv
Initial Cal. Standard Avg.		18785.3	95.00	35250.3	101.00	51945.0	97.00	73505.0	101.00	90893.0	97.00
Calibration Post-Check Run	1	19140	97.5	36876	94.18	54457	92.70	74701	96.07	91797	94.18
	2	18997	96.8	36435	93.06	53277	90.69	75639	97.28	92184	94.57
	3	18903	96.3	37083	94.71	54753	93.20	75310	96.85	92583	94.98
		Average =	96.8		93.98		92.20		96.73		94.58
		Standard Response Factor =	197.74		349.01		535.52		727.77		937.04
		QA Response Factor =	200.14		364.34		558.37		744.72		950.39
		Mean Response Factor =	198.94		356.67		546.95		736.25		943.72
		Percent Difference, % =	1.21		4.30		4.18		2.30		1.41
		Pass/Fail Criterion (<5%) =	Pass		Pass		Pass		Pass		Pass

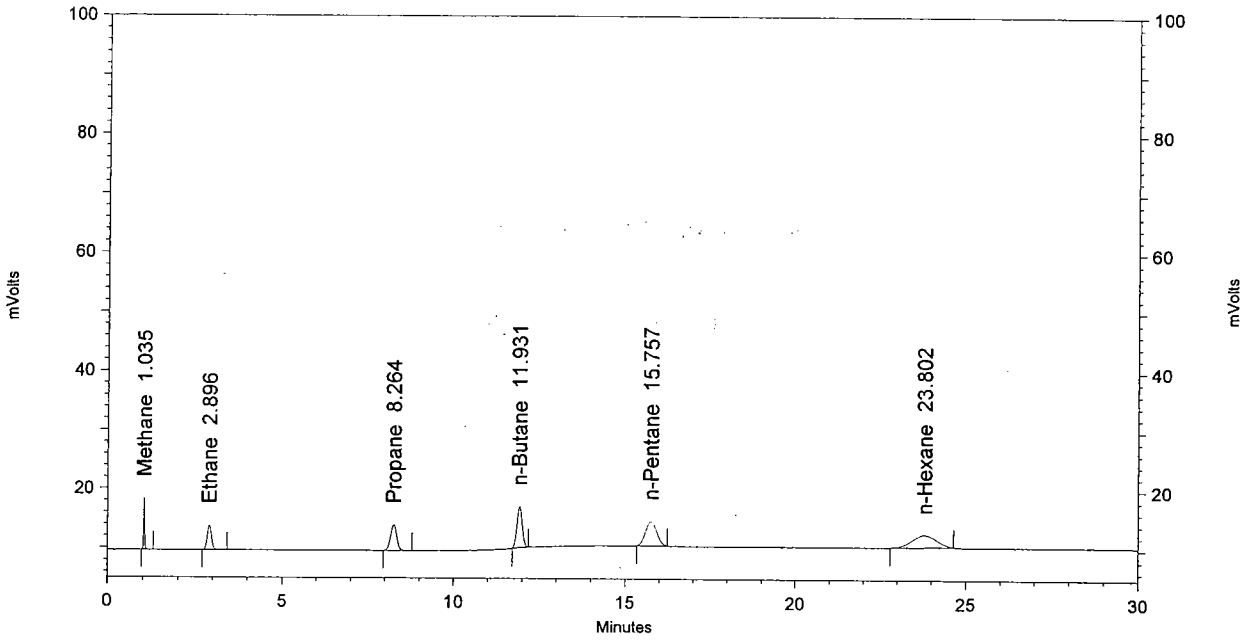
820

Sample ID No.	GC Run No.	Area Counts n-Hexane area counts	Concentration n-Hexane ppmv
Initial Cal. Standard Avg.		105595.3	96.000
Calibration Post-Check Run	1	101790	88.374
	2	102862	89.305
	3	108239	93.973
		Average =	90.551
		Standard Response Factor =	1099.95
		QA Response Factor =	1086.43
		Mean Response Factor =	1093.19
		Percent Difference, % =	1.24
		Pass/Fail Criterion (<5%) =	Pass

Operator _____ Date 11-20-09

Entech Engineering Inc. League City, Texas

SAMPLE ID: 100ppm paraffin
FILE: E:\Calibration\GC#1\post_112009\100pa2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/23/2009 10:47:35 AM
PRINTED: 11/23/2009 10:47:46 AM
USER: System

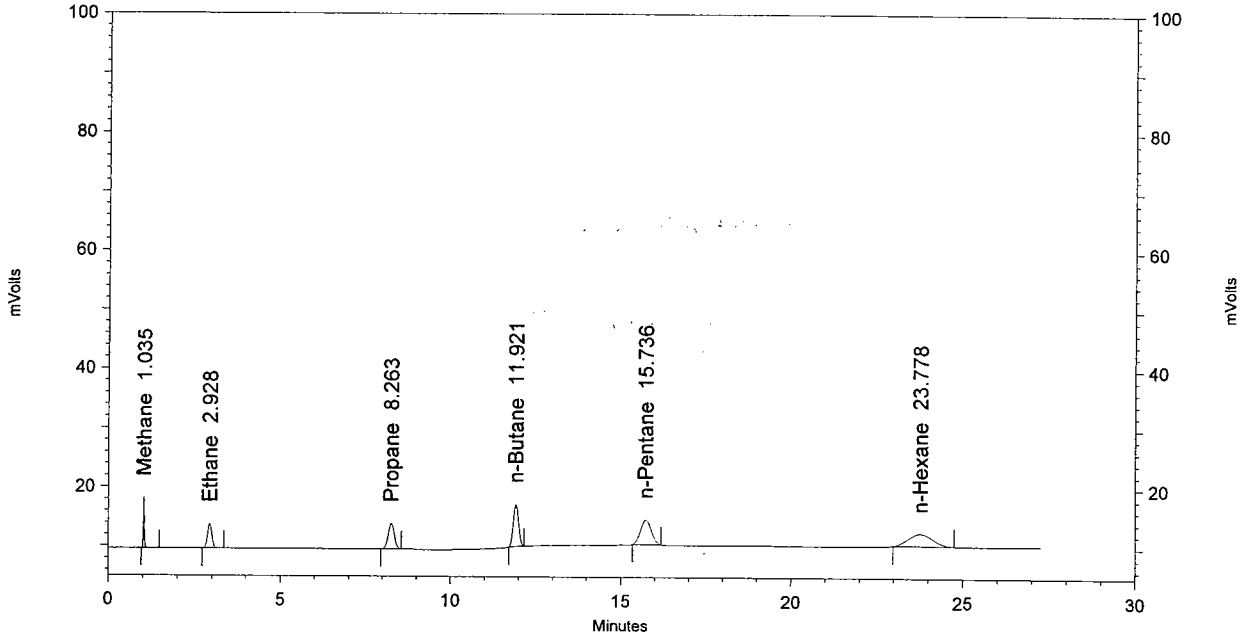


FID-2 Results

Name	Retention Time	Area
Methane	1.035	19140
Ethane	2.896	36876
Propane	8.264	54457
n-Butane	11.931	74701
n-Pentane	15.757	91797
n-Hexane	23.802	101790
Totals		378761

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 100ppm paraffin
FILE: E:\Calibration\GC#1\post_112009\100pa3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/23/2009 10:48:52 AM
PRINTED: 11/23/2009 10:48:58 AM
USER: System

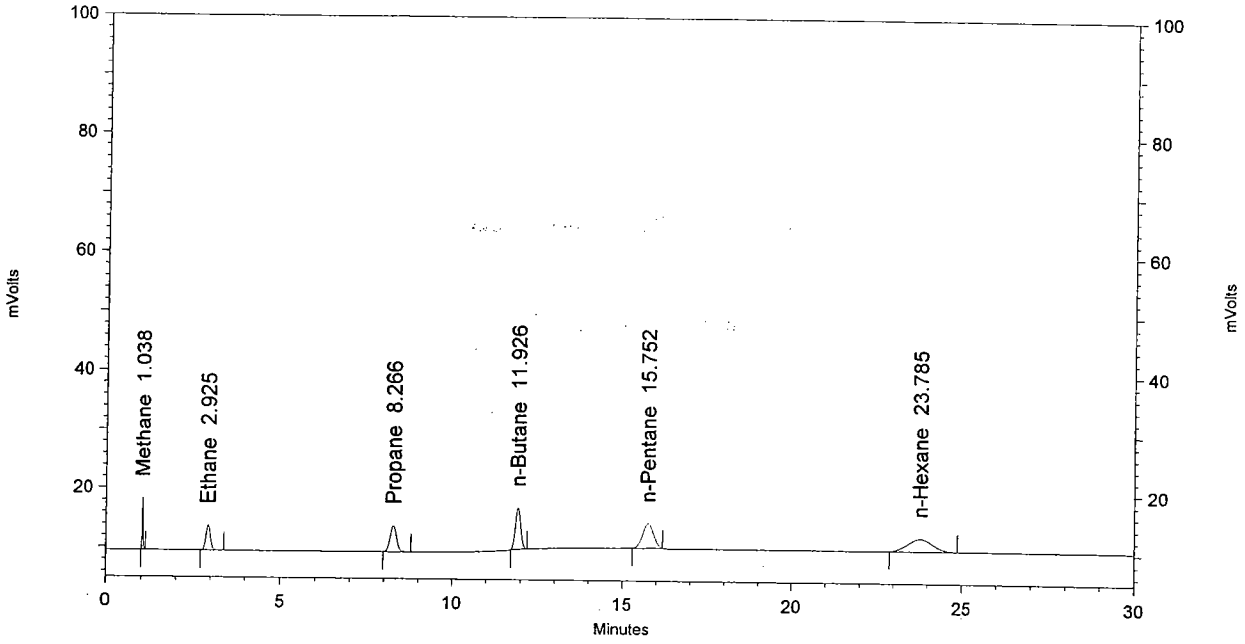


FID-2 Results

Name	Retention Time	Area
Methane	1.035	18996
Ethane	2.928	36435
Propane	8.263	53277
n-Butane	11.921	75639
n-Pentane	15.736	92184
n-Hexane	23.778	102862
Totals		379393

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 100ppm paraffin
FILE: E:\Calibration\GC#1\post_112009\100pa4.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/23/2009 10:50:08 AM
PRINTED: 11/23/2009 10:50:13 AM
USER: System



FID-2 Results

Name	Retention Time	Area
Methane	1.038	18903
Ethane	2.925	37083
Propane	8.266	54753
n-Butane	11.926	75310
n-Pentane	15.752	92583
n-Hexane	23.785	108239
Totals		386871

B23

GC VOC Analysis

QA/QC Results and Raw Data
(EPA Method 18)

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC#1 - Paraffins & Olefins Minimum Detection Limits Study (EPA Method 18) - September 02, 2009

Initial Calibration Date: August 27, 2009 - GC#1 FID-2 (Range1), Haysep Q Column

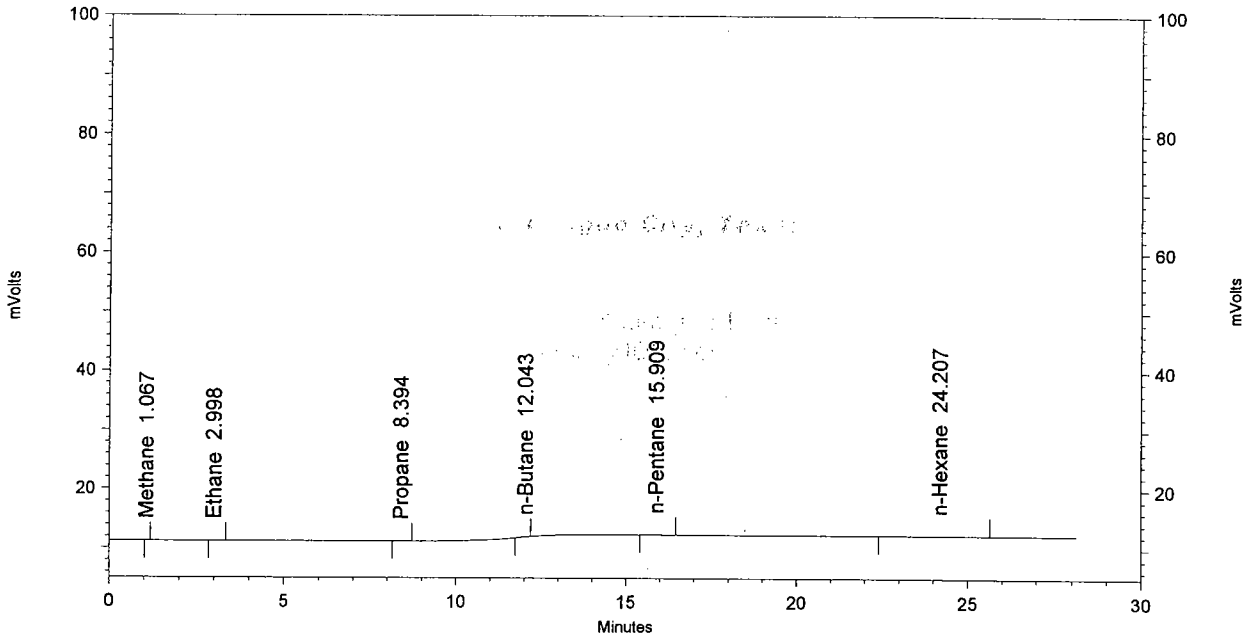
ID	Run 1	Run 2	Run 3	Concentration 1 (ppmv)	Concentration 2 (ppmv)	Concentration 3 (ppmv)	Average Conc. (ppmv)	**Detection Limit**	Recovered Concentration (ppmv)	Spiking Concentration (ppmv)	Spike Percent Recovery	Control Limit (70-130)%
Methane	239	226	240	1.22	1.15	1.22	1.20	**0.24**	1.20	1.53	78%	Pass
Ethane	447	410	447	1.14	1.05	1.14	1.11	**0.22**	1.11	1.52	73%	Pass
Propane	713	693	729	1.21	1.18	1.24	1.21	**0.24**	1.21	1.50	81%	Pass
n-Butane	1024	999	1065	1.32	1.31	1.39	1.34	**0.27**	1.34	1.52	88%	Pass
n-Pentane	1289	1222	1203	1.32	1.25	1.23	1.27	**0.25**	1.27	1.49	86%	Pass
n-Hexane	1585	1489	1518	1.38	1.29	1.32	1.33	**0.27**	1.33	1.47	90%	Pass
Ethylene	469	481	463	1.27	1.30	1.25	1.27	**0.25**	1.27	1.50	85%	Pass
Propylene	696	696	623	1.26	1.26	1.13	1.22	**0.24**	1.22	1.52	81%	Pass
1-Butene	983	962	991	1.31	1.29	1.33	1.31	**0.26**	1.31	1.49	88%	Pass
1-Pentene	1324	1367	1350	1.44	1.49	1.47	1.47	**0.29**	1.47	1.50	98%	Pass
1-Hexene	1685	1680	1617	1.59	1.58	1.52	1.56	**0.31**	1.56	1.49	105%	Pass

Note: The MDL Standard Prepared by Diluting 1.5ml of Paraffin/Olefins Standard (1000ppm) to 1L of Nitrogen Bag.

Operator km Date Sep 03/2009

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: paraffin MDL
FILE: E:\Calibration\GC#1\Post_090209\para_mdl1.dat
METHOD E:\Calibration\GC#1\FID-2 30min_MDL.met
ACQUIRED: 9/2/2009 7:14:27 PM
PRINTED: 9/2/2009 7:14:33 PM
USER: System

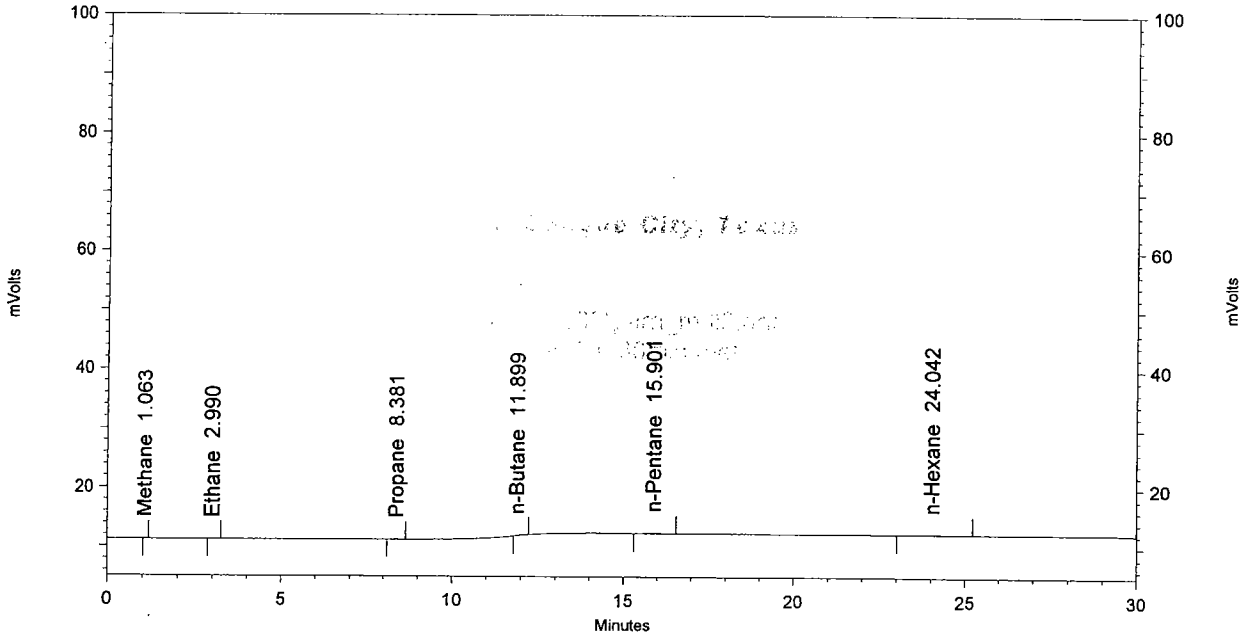


FID-2 Results

Name	Retention Time	Area
Methane	1.067	239
Ethane	2.998	447
Propane	8.394	713
n-Butane	12.043	1024
n-Pentane	15.909	1289
n-Hexane	24.207	1585
Totals		5297

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: paraffin MDL
FILE: E:\Calibration\GC#1\Post_090209\para_mdl2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/3/2009 8:32:02 AM
PRINTED: 9/3/2009 8:32:29 AM
USER: System

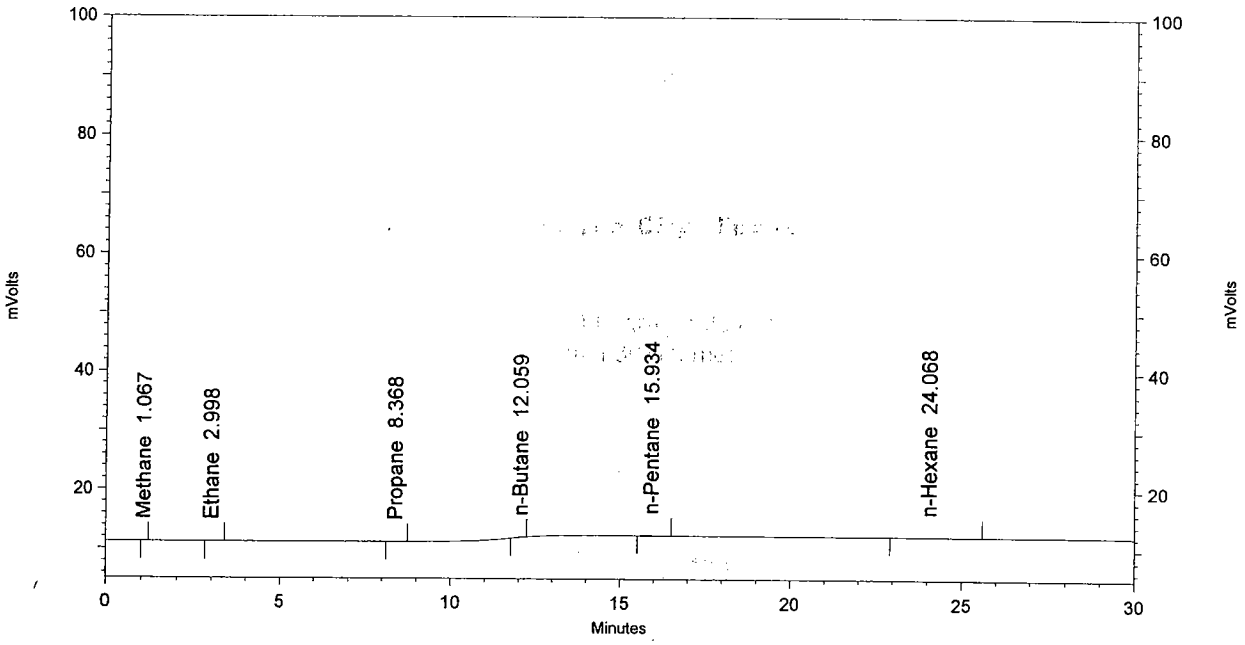


FID-2 Results

Name	Retention Time	Area
Methane	1.063	226
Ethane	2.990	410
Propane	8.381	693
n-Butane	11.899	999
n-Pentane	15.901	1222
n-Hexane	24.042	1489
Totals		5039

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: paraffin MDL
FILE: E:\Calibration\GC#1\Post_090209\para_mdl3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 9/3/2009 8:40:47 AM
PRINTED: 9/3/2009 8:40:58 AM
USER: System



FID-2 Results

Name	Retention Time	Area
Methane	1.067	240
Ethane	2.998	447
Propane	8.368	729
n-Butane	12.059	1065
n-Pentane	15.934	1203
n-Hexane	24.068	1518
Totals		5202

528

GC VOC Analysis

Gas Dilution System Validation
(EPA Method 205)

B29

ENTECH ENGINEERING INC.

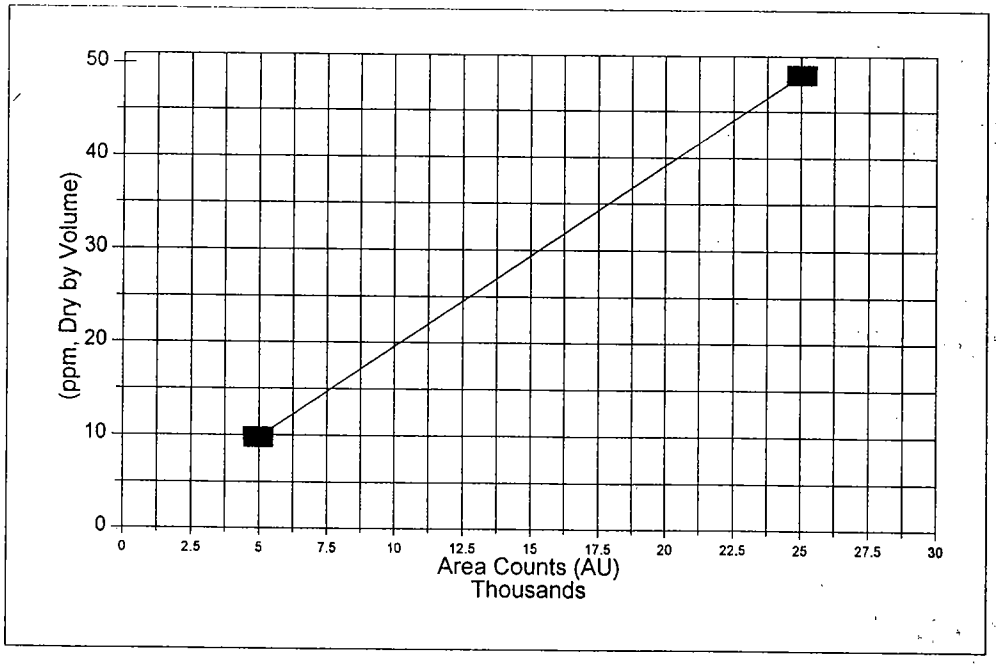
Gas Chromatograph Analysis Standard Curve Data
GC #1 FID (Channel B @ Range 1)
Propane Standard (Air Liquide CC115715, 490ppm Propane certified)

10/14/08

Dilution System : ENGASDL002

Dilution Factor	Predicted Concentration (ppmv)	Area Count				Precision Error			Calculated Concetration (ppmv)	% Difference (%)
		Run 1	Run 2	Run 3	Average	Run 1 (%)	Run 2 (%)	Run 3 (%)		
1:50	9.80	4979	4952	5015	4982.0	-0.06	-0.60	0.66	9.80	0.00
1:10	49.00	25288	24650	25176	25038.0	1.00	-1.55	0.55	48.90	-0.20

Constant	0.0625
R Squared	1.0000
No. of Observations	2
Degrees of Freedom	0
X Coefficient(s)	1.954527E-03



Operator pm Date Oct 20 / 2008

630

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC115715

Customer: Entech Engineering
P.O. Number: 51831
Item Number:
Notes:

Shipping Order #: 25000221
Transfer #: 25000221
LOT #: LPX220350
Valve CGA350
Cyl. Pressure:* 1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 7-May-07 **Expiration Date: 6-May-10**

Component	Requested Concentration	Assay Concentration
Propane	500 ppm	490 ±5 ppm
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS290	GMIS290	497.0	ppm	2.52	C3H8	N2	CC61240	5/3/2008	N.A.

Analysis Information:

Component 1:	Propane
Analyzer Information	
Manufacturer:	HP
Model Number:	6890
Serial Number:	8295
Analytical Principle:	GC-FID
MPC Calibrated:	05/07/07

	First Triad Analysis On: 5/7/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.00	0.00	
Reference	474.10	477.14	475.61	
Candidate	469.16	469.72	468.19	
Result	490.25	490.84	489.23	ppm
		Mean Result:	490.11	ppm

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

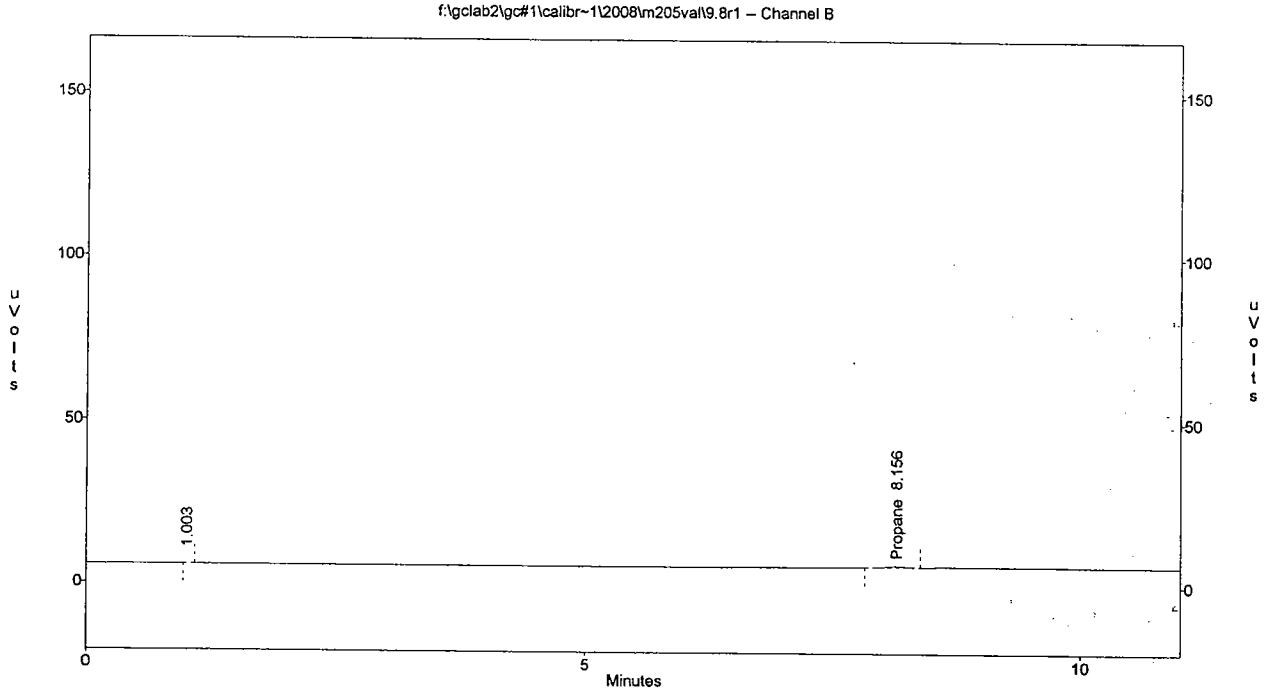
Analyst Signature: Warren Pereira **Calculated by:** Warren Pereira

B31

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\9.8r1
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 9.8ppm propane
Acquired : Oct 20, 2008 13:18:53
Printed : Oct 20, 2008 13:31:04
User : System



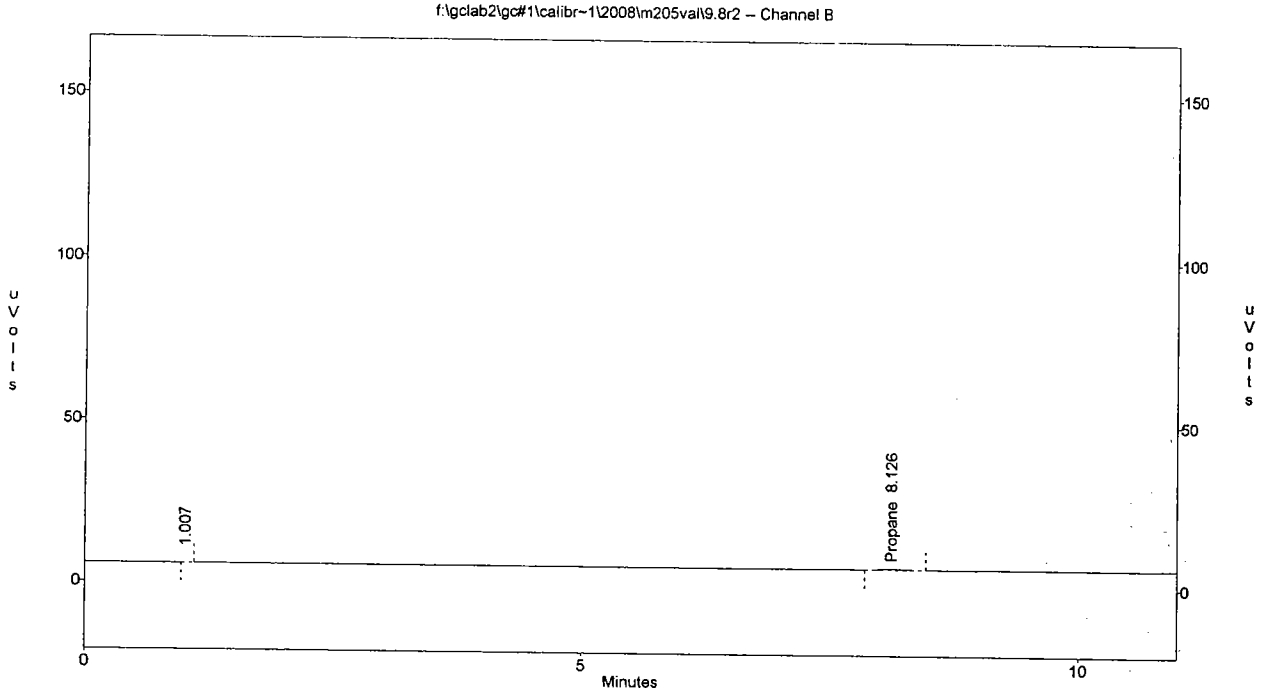
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	41	0.0
Propane	8.16	4979	9.7
Totals :		5020	9.7

B32

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\9.8r2
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 9.8ppm propane
Acquired : Oct 20, 2008 13:33:34
Printed : Oct 20, 2008 13:46:17
User : System

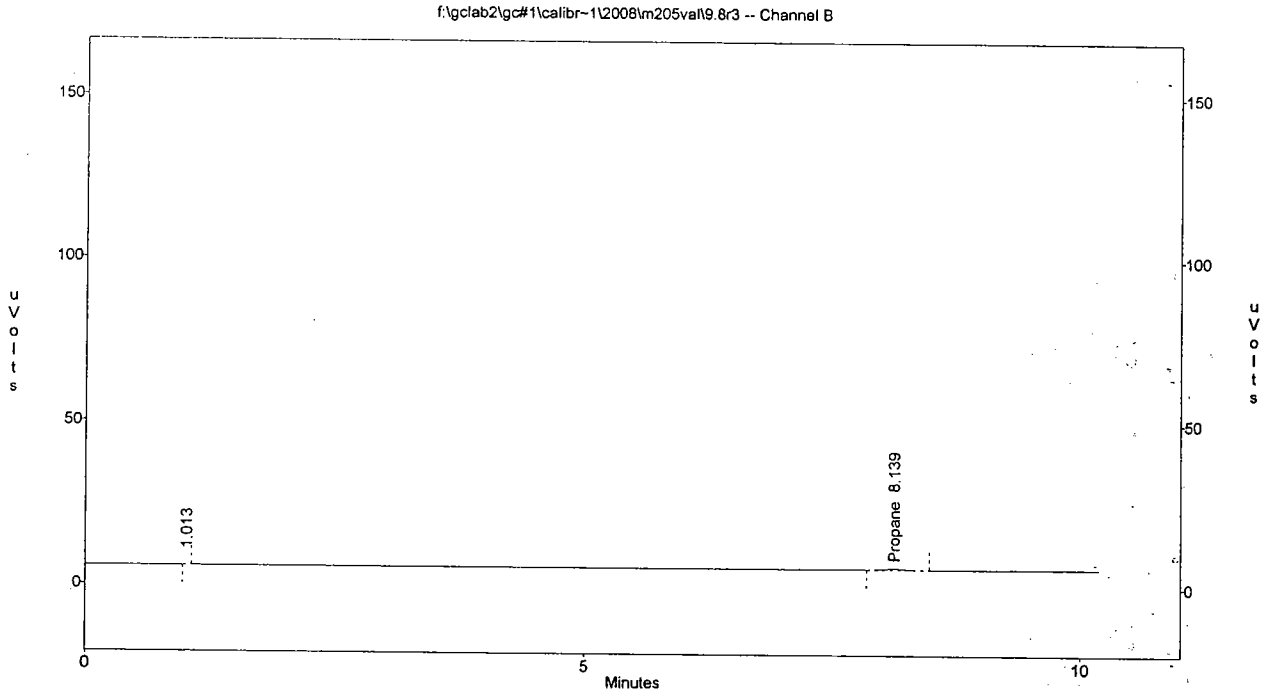


Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	42	0.0
Propane	8.13	4952	9.6
Totals :		4994	9.6

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\9.8r3
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 9.8ppm propane
Acquired : Oct 20, 2008 13:48:23
Printed : Oct 20, 2008 13:58:35
User : System



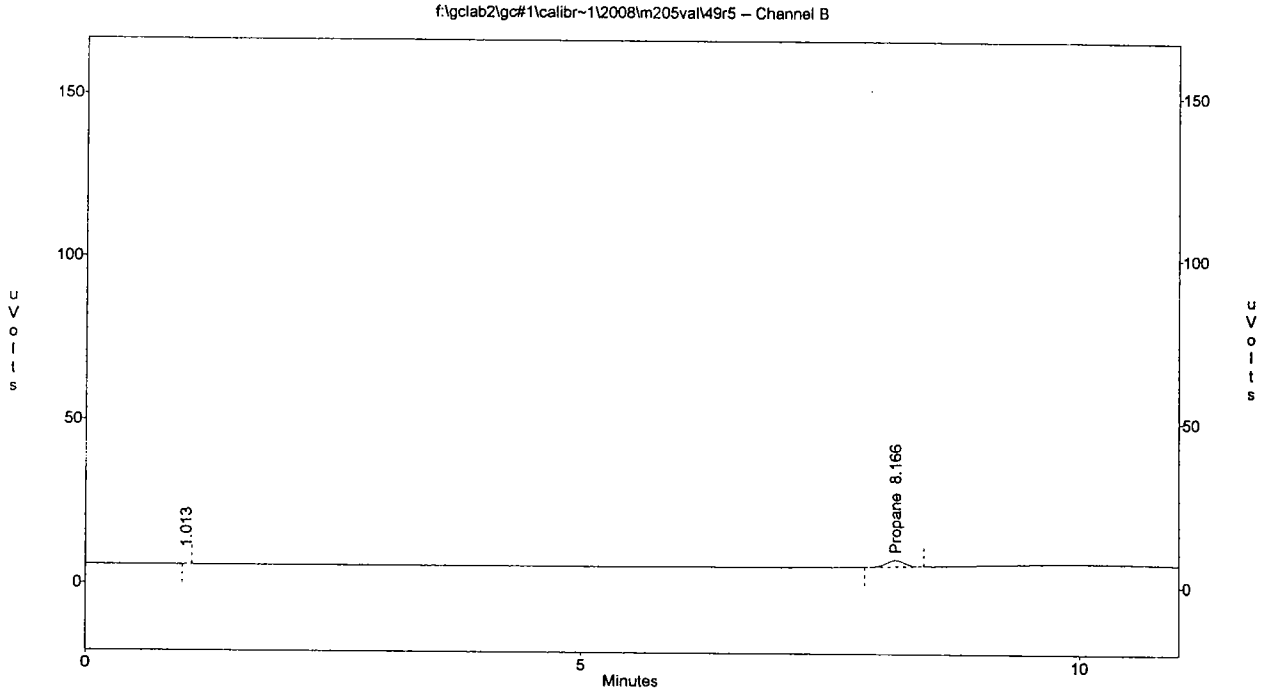
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	38	0.0
Propane	8.14	5015	9.7
Totals :		5053	9.7

634

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\49r5
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 49ppm propane
Acquired : Oct 17, 2008 14:58:35
Printed : Oct 17, 2008 16:08:28
User : System



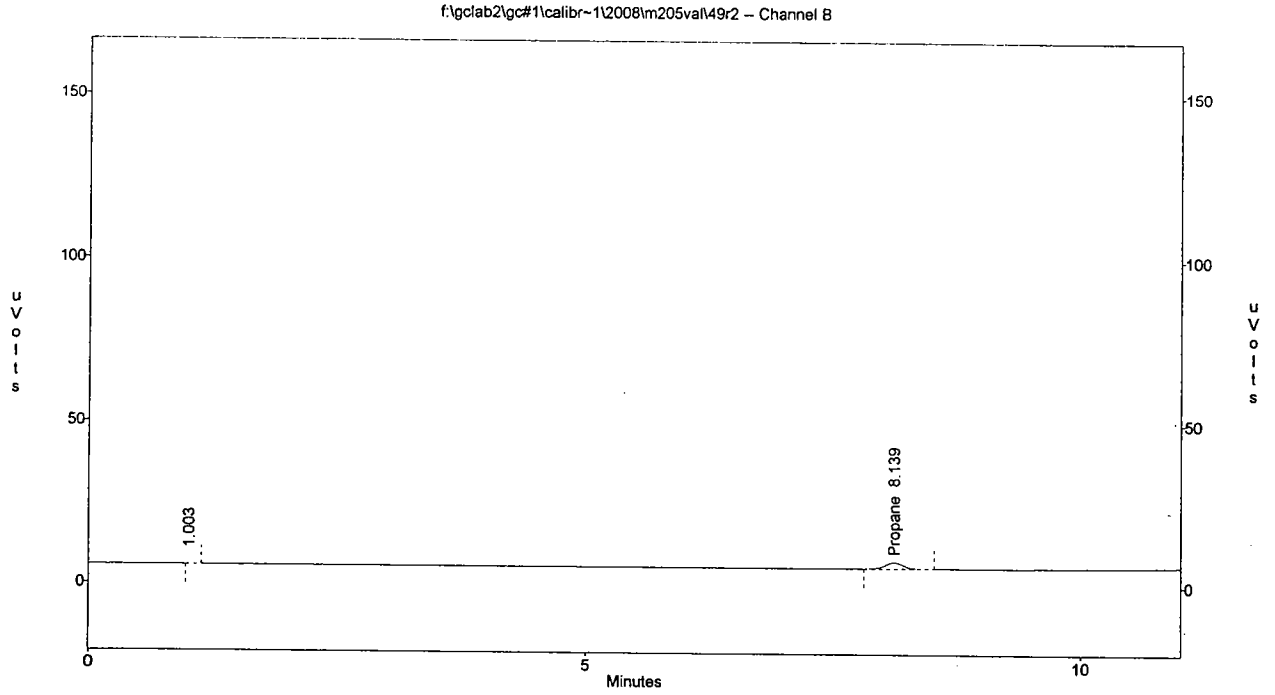
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	40	0.0
Propane	8.17	25288	49.1
Totals :		25328	49.1

635

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\49r2
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 49ppm propane
Acquired : Oct 14, 2008 14:58:24
Printed : Oct 14, 2008 15:11:06
User : System



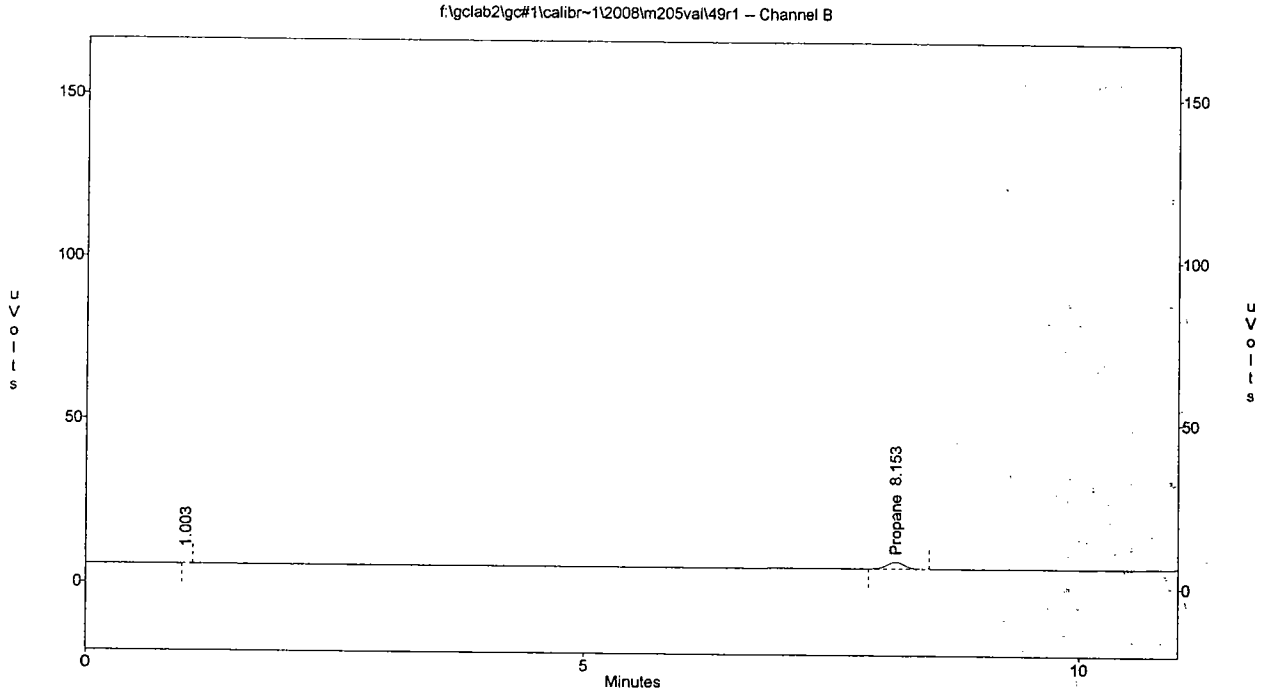
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	50	0.0
Propane	8.14	24650	47.9
Totals :		24700	47.9

B36

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\49r1
Method : f:\gclab2\gc#1\fid_m205.met
Sample ID : 49ppm propane
Acquired : Oct 14, 2008 14:43:35
Printed : Oct 20, 2008 12:57:13
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	42	0.0
Propane	8.15	25176	48.9
Totals :		25218	48.9

B37

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Dilution System Validation Study (EPA Method 205)

Gas Dilution System ID: ENGASDL002
Calibration Standard: Air Liquide CC115715
Calibration Date: October 14, 2008
Propane X Coefficent: 1.954527E-03

Validation Gas Standard: Air Liquide CC161053
Validation Date: October 17, 2008
Certified Concentration: 31.0 ppm

Instrument: GC#1 FID-2, Range 1 **Column:** 80/100 Haysep Q, 6 ft X 1/8 in, S.S. (316) **Sample Injection Loop:** 1000 ul

ID	Run 1 Area	Run 2 Area	Run 3 Area	Average Area	Precision Error (%) Run 1	Run 2	Run 3	Average Conc. (ppmv)	Certified Std. Conc. (ppmv)	Percent Difference	Control Limit (< 2)%
Propane	15537	15718	15642	15632	0.61%	0.55%	0.06%	30.55	31.00	1.45%	Pass

Operator [signature] Date Oct 20/2008

B38

AIR LIQUIDE™

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC161053

Customer:	Entech Engineering	**Shipping Order #:**	25000357
P.O. Number:	51831	**Transfer #:**	25000357
Item Number:		**LOT #:**	LPX220344
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig

Assay Date: 3-May-07 **Expiration Date: 2-May-10**

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Propane	**30 ppm**	**31.0 ±0.5 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS281	GMIS281	49.9	ppm	0.184	C3H8	N2	CC28041	5/3/2008	N.A.

Analysis Information:

Component 1: Propane

Analyzer Information	
Manufacturer:	HP
Model Number:	6890
Serial Number:	8295
Analytical Principle:	GC-FID
MPC Calibrated:	04/05/07

	First Triad Analysis On: 5/3/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.00	0.00	
Reference	47.99	47.96	47.93	
Candidate	29.79	29.77	29.84	
Result	31.00	30.98	31.05	ppm
Mean Result:			31.01	ppm

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
Mean Result:				

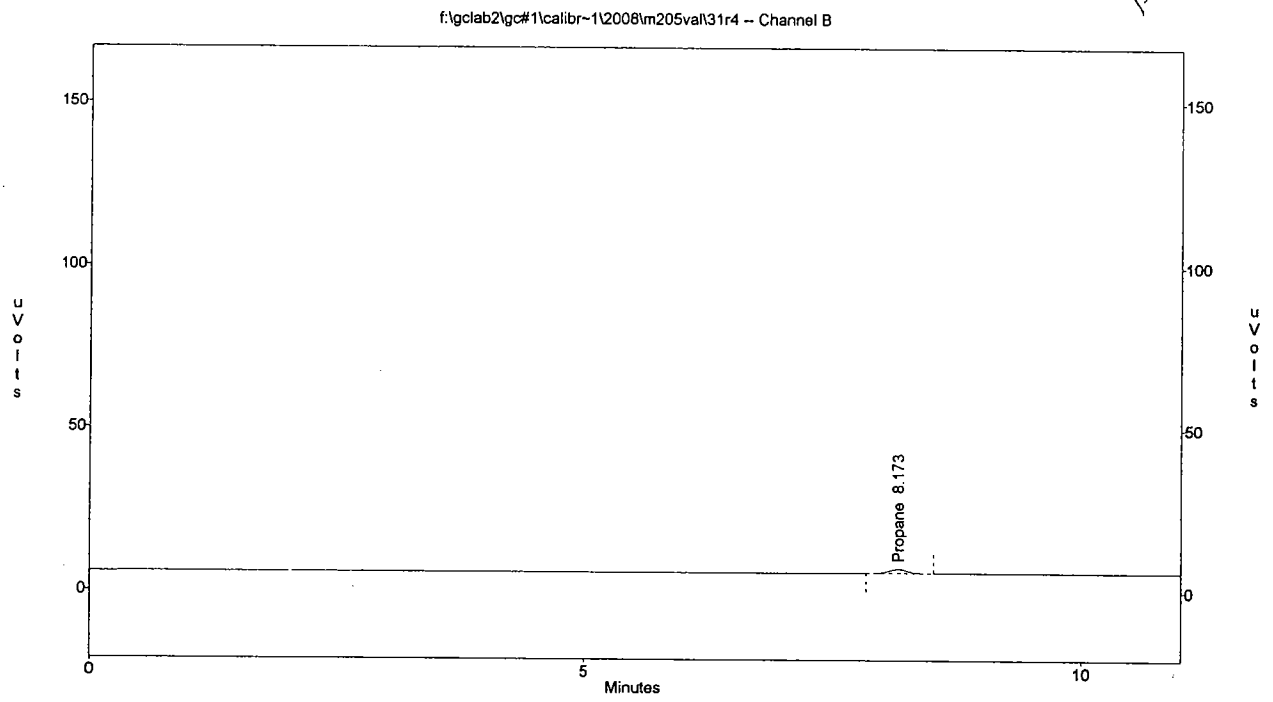
Analyst Signature: _____ Warren Pereira **Calculated by:** _____ Warren Pereira

B39

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\31r4
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 31ppm propane
Acquired : Oct 17, 2008 10:06:24
Printed : Oct 17, 2008 10:31:37
User : System

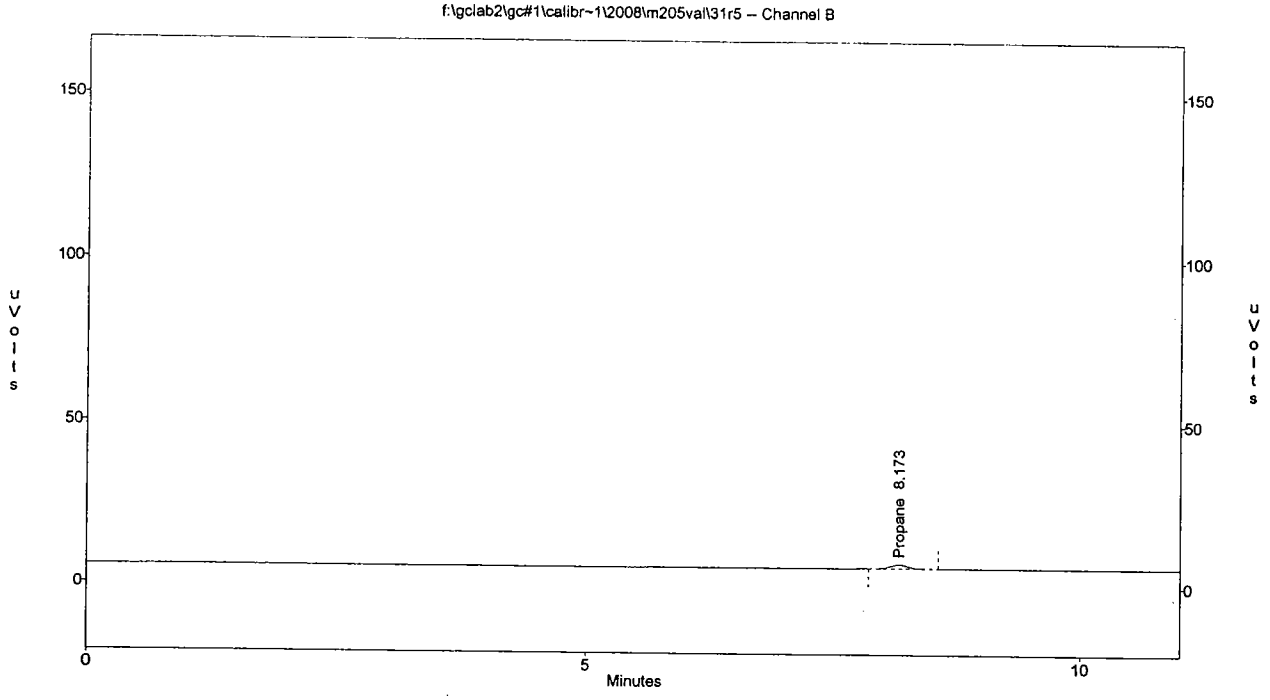


Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.17	15537	30.2
Totals :		15537	30.2

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\31r5
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 31ppm propane
Acquired : Oct 17, 2008 10:46:51
Printed : Oct 17, 2008 11:11:43
User : System



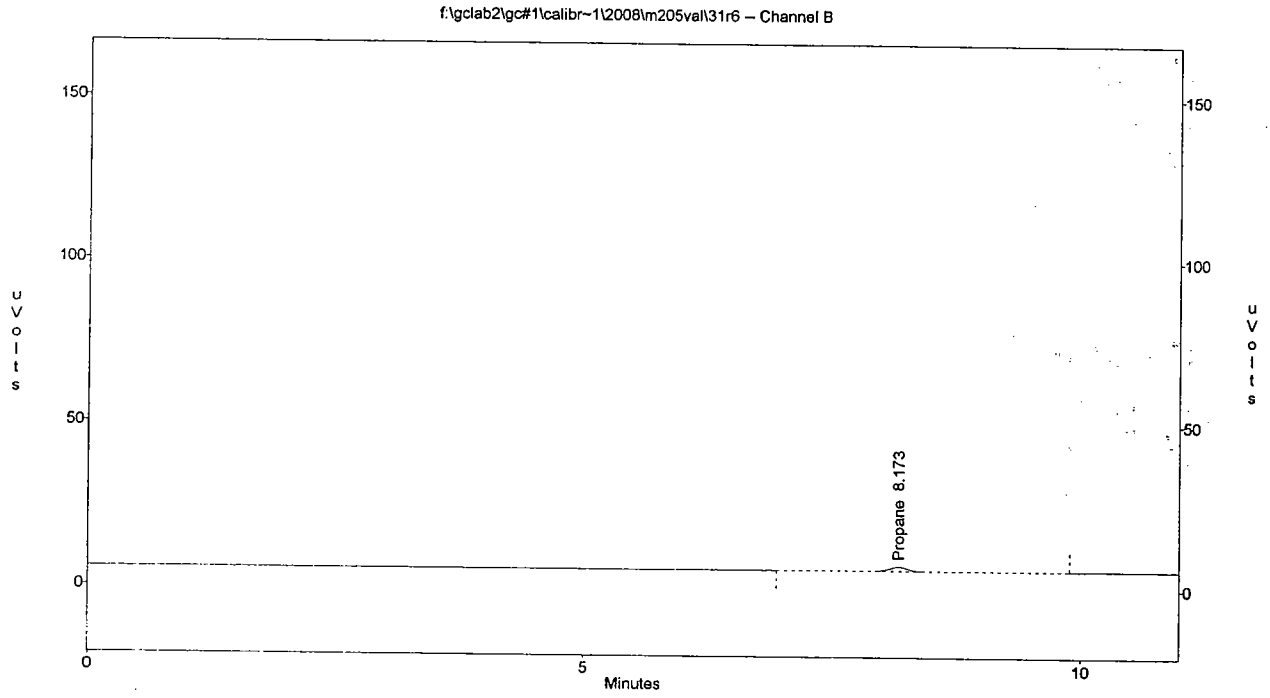
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.17	15642	30.4
Totals :		15642	30.4

B41

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\31r6
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 31ppm propane
Acquired : Oct 17, 2008 11:14:00
Printed : Oct 20, 2008 14:12:01
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.17	15718	30.5
Totals :		15718	30.5

B42

ENTECH ENGINEERING INC.

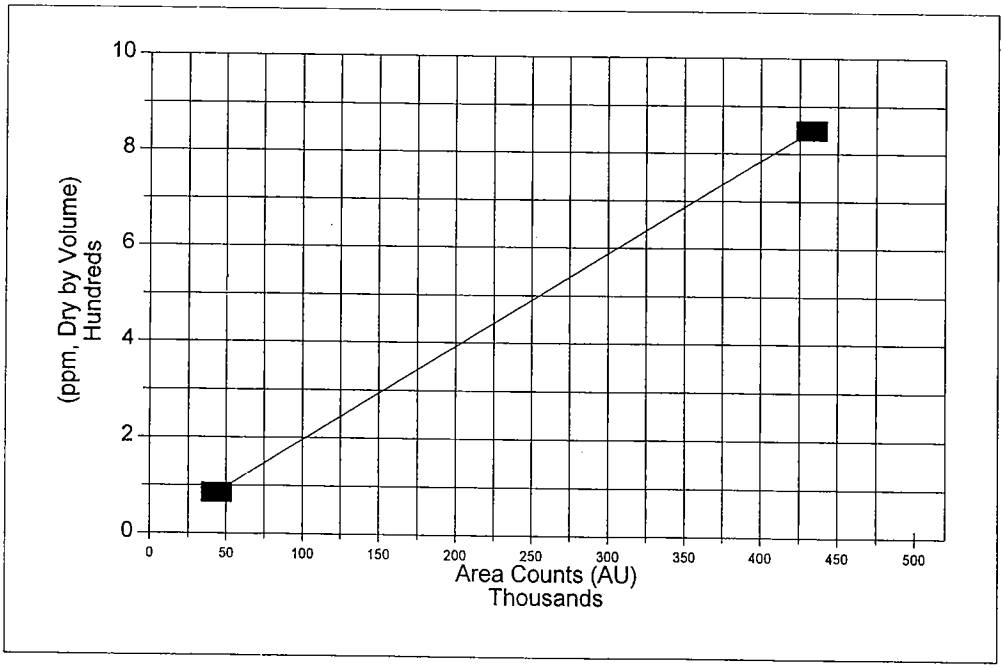
Gas Chromatograph Analysis Standard Curve Data
GC #1 FID (Channel B @ Range 1)
Propane Standard (AirGas SG1014905, 8.49% Propane certified)

10/20/08

Dilution System : ENGASDL003

Dilution Factor	Predicted Concentration (ppmv)	Area Count				Precision Error			Calculated Concetration (ppmv)	% Difference (%)
		Run 1	Run 2	Run 3	Average	Run 1 (%)	Run 2 (%)	Run 3 (%)		
1:1000	84.90	43801	43004	44511	43772.0	0.07	-1.75	1.69	85.96	1.25
1:100	849.00	436916	432059	429614	432863.0	0.94	-0.19	-0.75	850.06	0.12

Constant	-1.0598
R Squared	1.0000
No. of Observations	2
Degrees of Freedom	0
X Coefficient(s)	1.963808E-03



Operator _____ Date Nov 05/2008

B43

AIR LIQUIDE™

CERTIFICATE OF ANALYSIS

Customer : Entech Engineering, Inc.
P.O. Number : 51915
Doc. # : 26216901-1B
Mix/Lot # : LPX225415
Item Number :
Valid Until : 11 August, 2012

Specification : Custom Certified
Phase : GAS
Cyl. Size : 30AL Valve : CGA 350
Pressure : 767 Psia
Volume : 55 SCF

Cylinder Number: **CC78830**

Requested Concentrations Mole	Component	Actual Concentration Mole	Analytical Uncertainty	Equipment Used Scale	Analyt. Inst.	Calibration Standard
Balance	NITROGEN	Balance		1399		
8.5 %	PROPANE	8.49 %	+/-2%	1399		

This mixture was prepared and certified by weight using one or more scales certified against weights traceable to N.I.S.T.

Comments:

Dewpoint calculated to 40 F, unless otherwise stated. Improper storage or use may affect the accuracy of this standard.

Certified by _____ Date: 13-Aug-2007

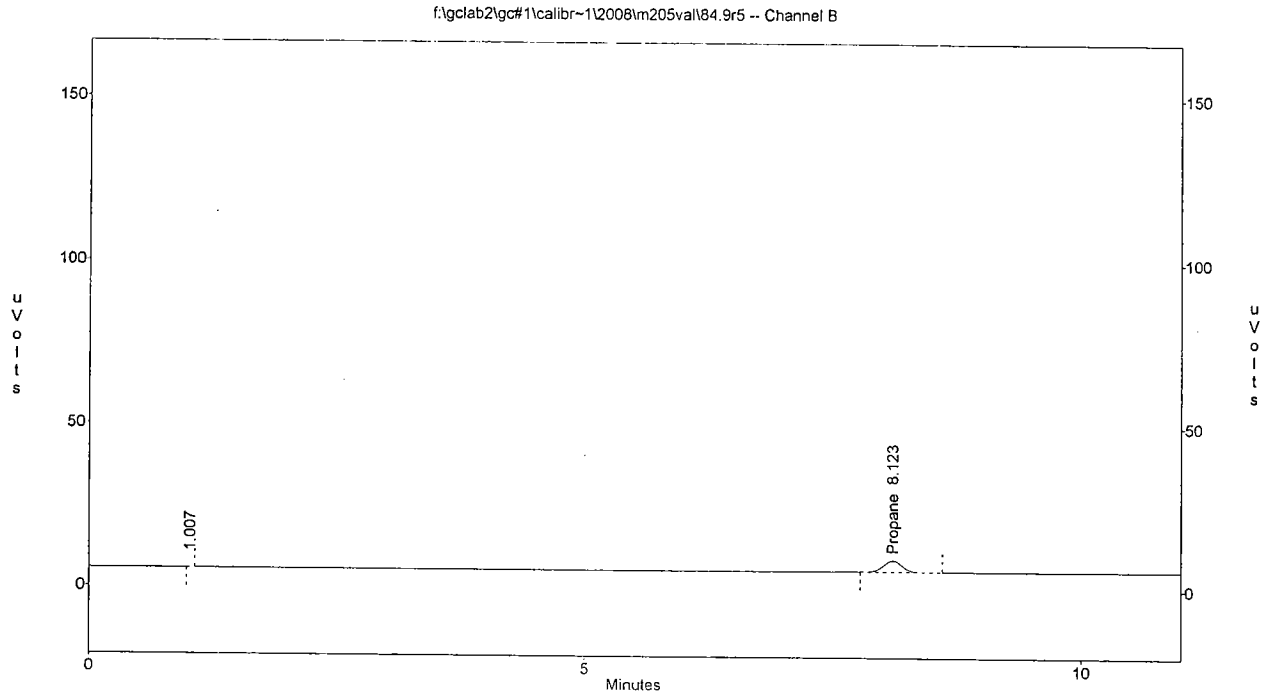
11426 Fairmont Pkwy -- LaPorte, TX 77571
Phone (281) 474-8400 **Fax** (281) 474-8419 **USA** (800) 248-1427

ISO: 9001-2000

844

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\84.9r5
Method : f:\gclab2\gc#1\fid_m205.met
Sample ID : 84.9ppm propane
Acquired : Oct 20, 2008 17:04:15
Printed : Nov 3, 2008 11:52:05
User : System



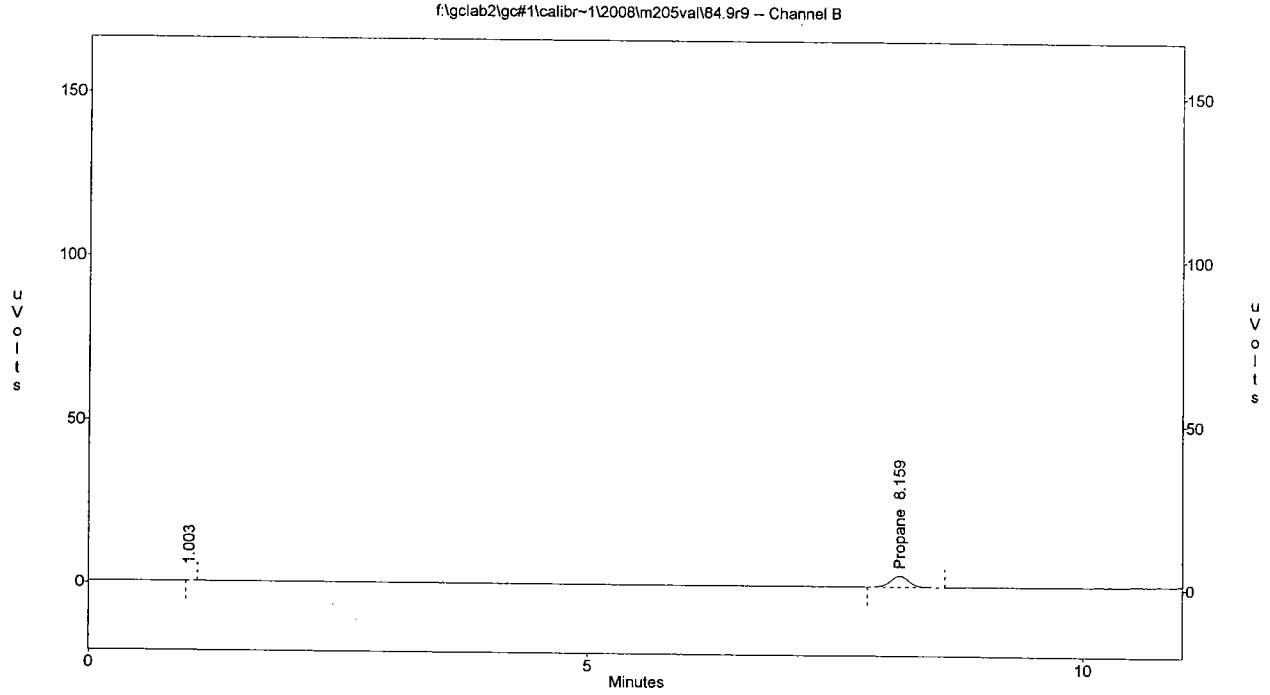
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	23	0.0
Propane	8.12	44511	86.4
Totals :		44534	86.4

B45

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\84.9r9
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 84.9ppm
Acquired : Nov 3, 2008 16:07:01
Printed : Nov 3, 2008 16:29:20
User : System



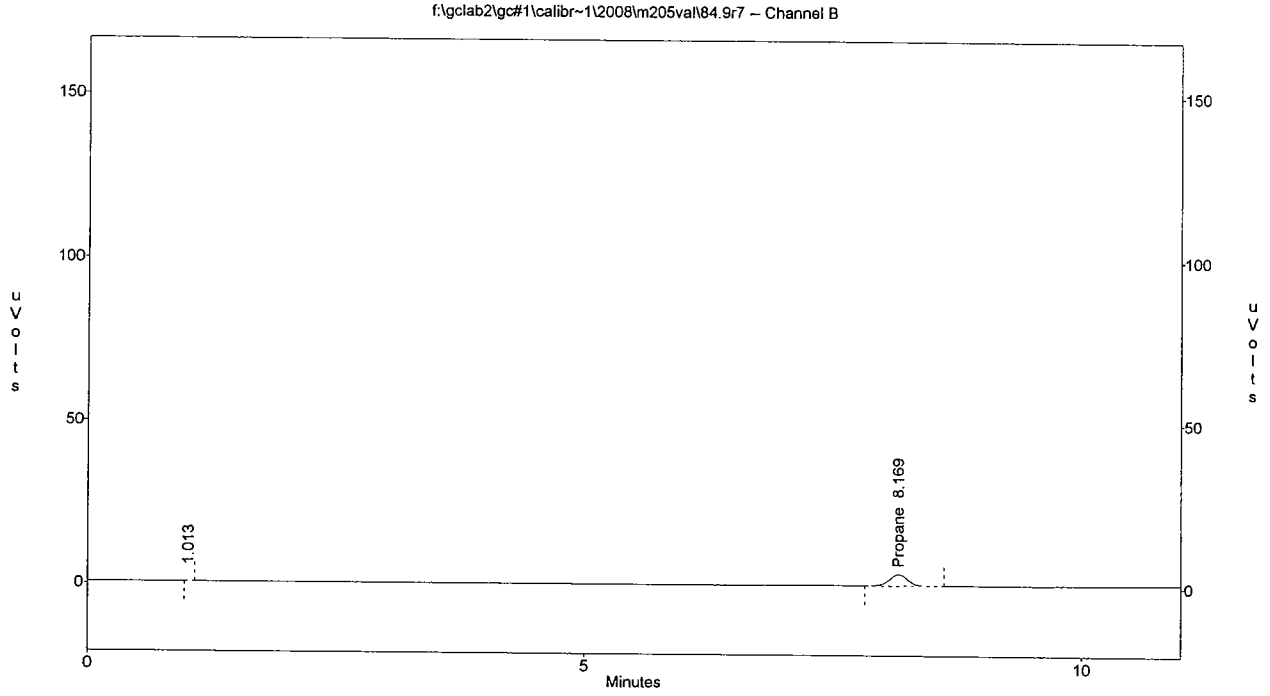
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	32	0.0
Propane	8.16	43004	83.5
Totals :		43036	83.5

B46

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\84.9r7
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 84.9ppm
Acquired : Nov 3, 2008 15:34:49
Printed : Nov 3, 2008 15:47:20
User : System



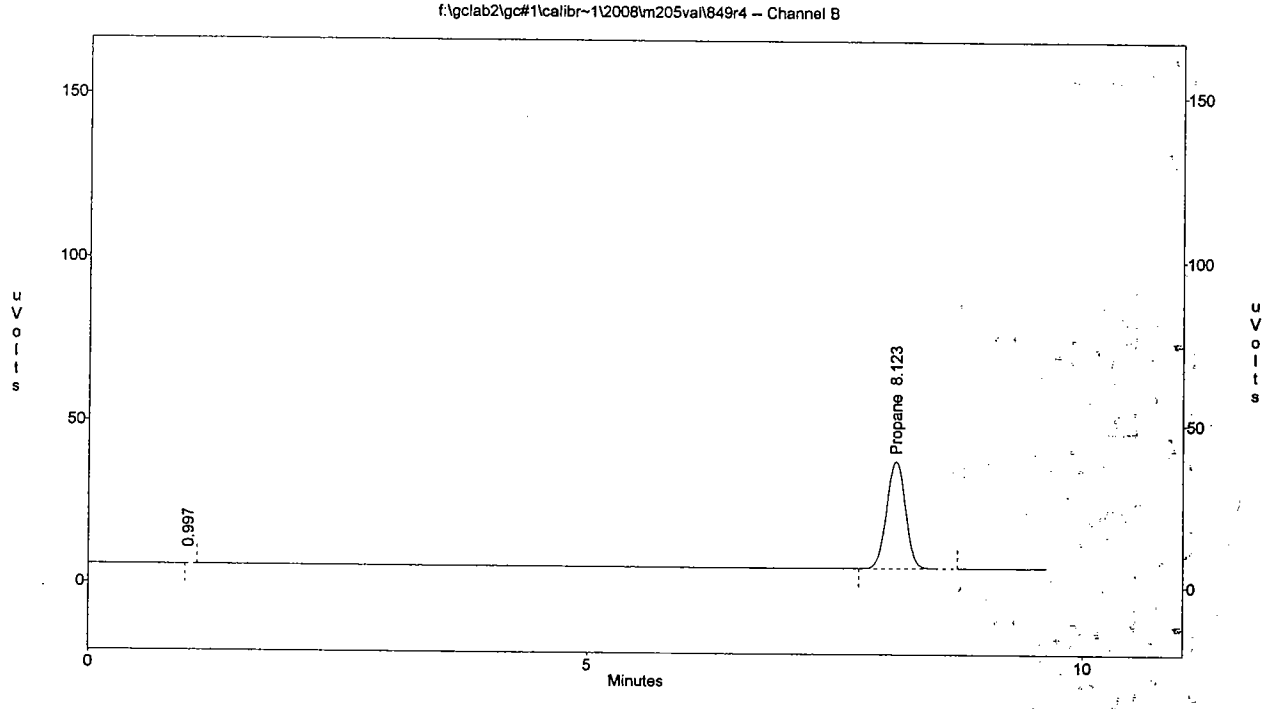
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	35	0.0
Propane	8.17	43801	85.1
Totals :		43836	85.1

B47

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\849r4
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 849ppm propane
Acquired : Oct 21, 2008 16:45:17
Printed : Oct 21, 2008 16:55:02
User : System



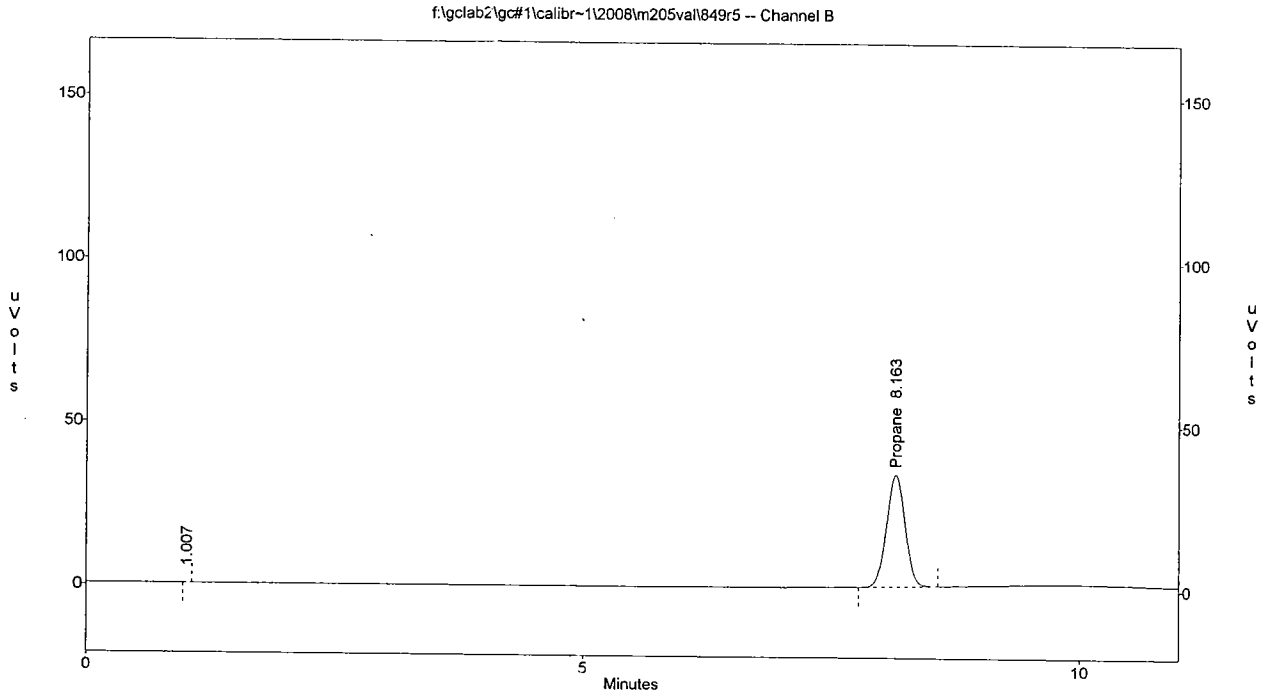
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	29	0.0
Propane	8.12	429614	834.2
Totals :		429643	834.2

848

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\849r5
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 849ppm
Acquired : Nov 3, 2008 12:46:33
Printed : Nov 3, 2008 13:17:05
User : System



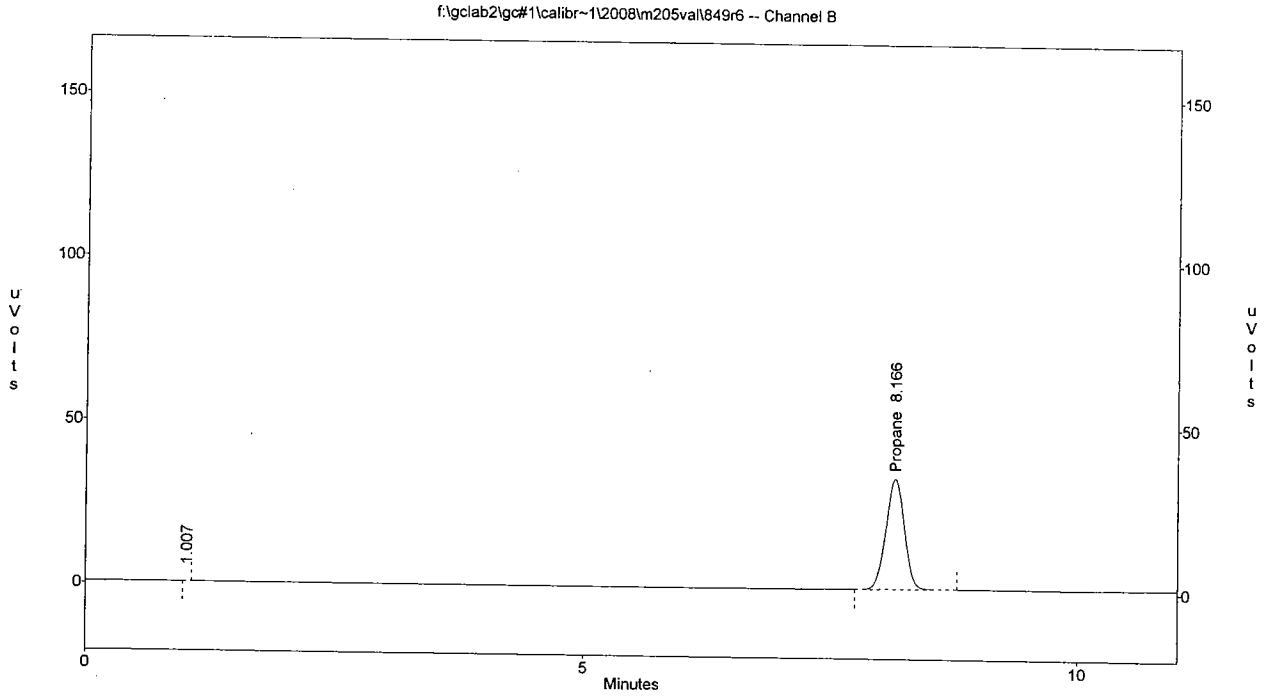
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	51	0.0
Propane	8.16	436916	848.4
Totals :		436967	848.4

B 49

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\849r6
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 849ppm
Acquired : Nov 3, 2008 13:40:15
Printed : Nov 3, 2008 14:11:59
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	45	0.0
Propane	8.17	432059	839.0
Totals :		432104	839.0

B 50

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Dilution System Validation Study (EPA Method 205)

Gas Dilution System ID: ENGASDL003
Calibration Standard: AirGas CC78830
Calibration Date: October 20, 2008
Propane X Coefficent: 1.963808E-03

Validation Gas Standard: Air Liquide (CC115715)
Validation Date: November 04, 2008
Certified Concentration: 490 ppmv

Instrument: GC#1 FID-2, Range 1 **Column:** 80/100 Haysep Q, 6 ft X 1/8 in, S.S. (316) **Sample Injection Loop:** 1000 ul

ID	Run 1 Area	Run 2 Area	Run 3 Area	Average Area	Precision Error (%) Run 1	Run 2	Run 3	Average Conc. (ppmv)	Certified Std. Conc. (ppmv)	Percent Difference	Control Limit (< 2)%
Propane	242063	245641	249971	245892	1.56%	0.10%	1.66%	482.88	490.00	1.45%	Pass

Operator RM Date Nov 05/2008

B51

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC115715

Customer:	Entech Engineering	**Shipping Order #:**	25000221
P.O. Number:	51831	**Transfer #:**	25000221
Item Number:		**LOT #:**	LPX220350
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig
Assay Date:	7-May-07	**Expiration Date: 6-May-10**	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Propane	**500 ppm**	**490 ±5 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS290	GMIS290	497.0	ppm	2.52	C3H8	N2	CC61240	5/3/2008	N.A.

Analysis Information:

Component 1:	Propane
Analyzer Information	
Manufacturer:	HP
Model Number:	6890
Serial Number:	8295
Analytical Principle:	GC-FID
MPC Calibrated:	05/07/07

	First Triad Analysis On: 5/7/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.00	0.00	
Reference	474.10	477.14	475.61	
Candidate	469.16	469.72	468.19	
Result	490.25	490.84	489.23	ppm
	Mean Result:		490.11	ppm

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
	Mean Result:			

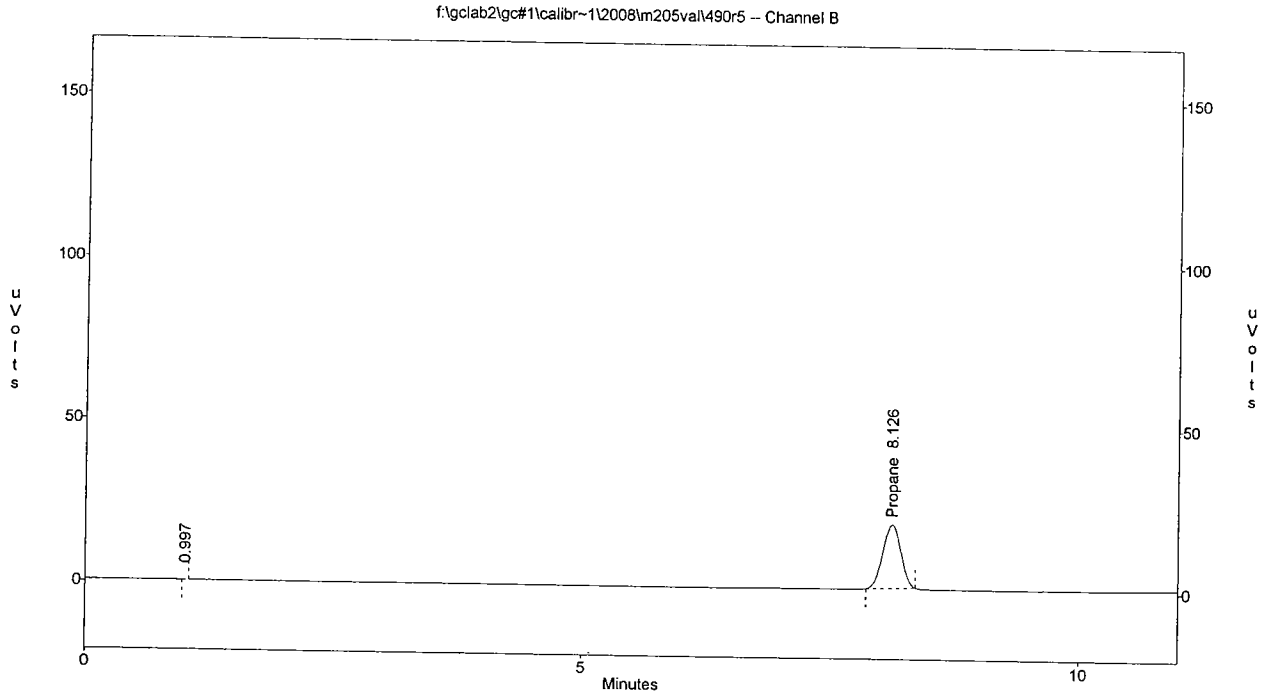
Analyst Signature: _____ Warren Pereira **Calculated by:** _____ Warren Pereira

B52

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\490r5
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 490ppm
Acquired : Nov 4, 2008 12:35:42
Printed : Nov 5, 2008 15:38:41
User : System



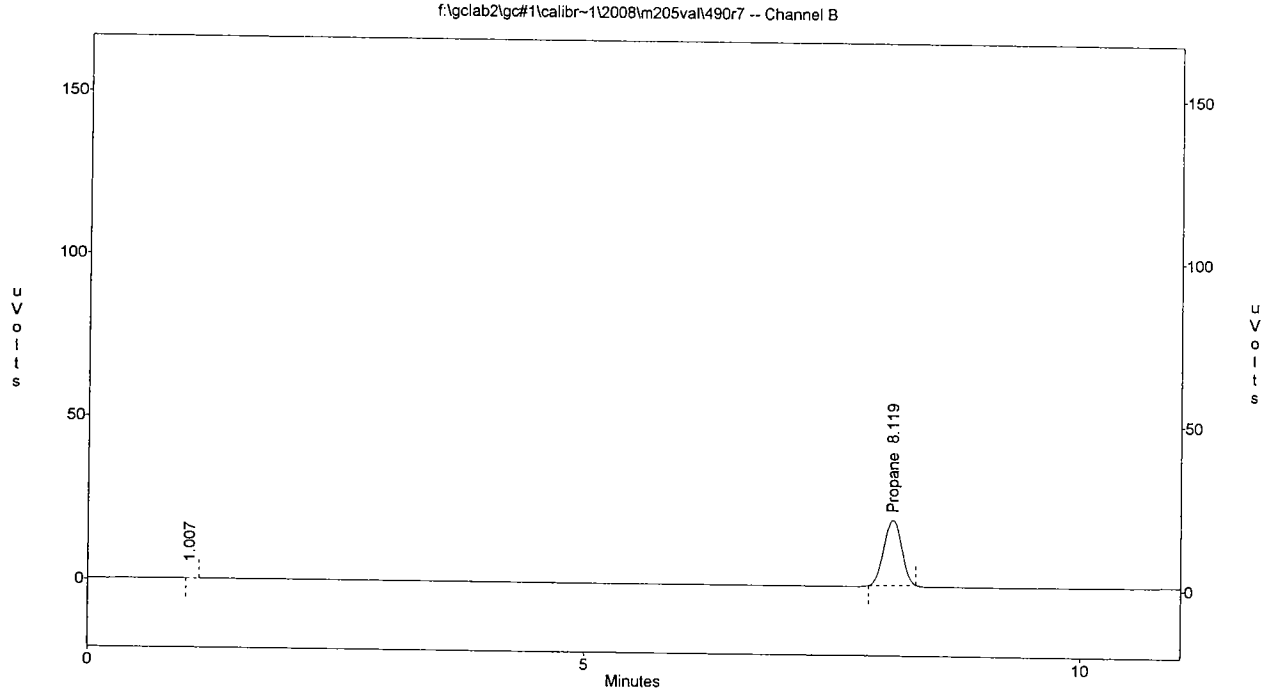
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	19	0.0
Propane	8.13	242063	470.0
Totals :		242082	470.0

B-53

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\490r7
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 490ppm
Acquired : Nov 4, 2008 15:22:50
Printed : Nov 5, 2008 15:39:28
User : System



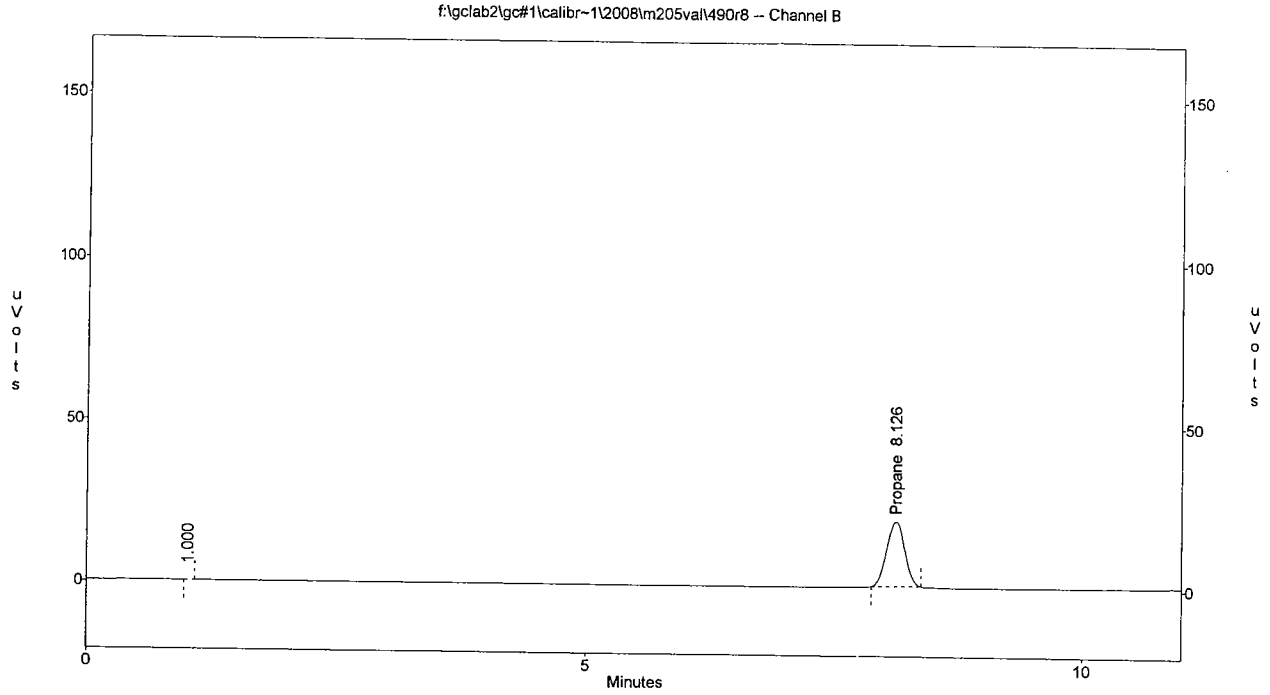
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.01	40	0.0
Propane	8.12	245641	477.0
Totals :		245681	477.0

B-54

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2008\m205val\490r8
Method : f:\gclab2\gc#1\Fid_m205.met
Sample ID : 490ppm
Acquired : Nov 4, 2008 16:24:22
Printed : Nov 5, 2008 15:40:05
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
	1.00	34	0.0
Propane	8.13	249971	485.4
Totals :		250005	485.4

11-5-5

GC VOC Analysis

Sample Results and Raw Data
(EPA Method 18)

ENTECH ENGINEERING INC.

ConocoPhilips. - Sweeny Refinery, Old Ocean, Texas - November 17, 2009

ES09-11-20832 / stack T1

	GC #1 X Coefficient	DF	Area Counts Run 1	Run 2	Run 3	Average	Concentration (%) Run 1	Run 2	Run 3	Averages	High Standard (%)
Methane	5.09E-03	1	385	397	385	389	1.961	2.022	1.961	1.981	1020.000
Ethane	2.55E-03	1	0	0	0	0	0.000	0.000	0.000	0.000	1010.000

GC#1 FID initial Calibration Date: 08-27-2009.

DF = Dilution Factor.

ENTECH ENGINEERING INC.

ConocoPhilips. - Sweeny Refinery, Old Ocean, Texas - November 18, 2009

ES09-11-20851 / stack T2

	GC #1 X Coefficient	DF	Area Counts Run 1	Run 2	Run 3	Average	Concentration (%) Run 1	Run 2	Run 3	Averages	High Standard (%)
Methane	5.09E-03	1	397	415	433	415	2.022	2.114	2.205	2.114	1020.000
Ethane	2.55E-03	1	0	0	0	0	0.000	0.000	0.000	0.000	1010.000

GC#1 FID initial Calibration Date: 08-27-2009.

DF = Dilution Factor.

ES09-11-20852 / stack T3

	GC #1 X Coefficient	DF	Area Counts Run 1	Run 2	Run 3	Average	Concentration (%) Run 1	Run 2	Run 3	Averages	High Standard (%)
Methane	5.09E-03	1	944	927	914	928	4.808	4.721	4.655	4.728	1020.000
Ethane	2.55E-03	1	0	0	0	0	0.000	0.000	0.000	0.000	1010.000

GC#1 FID initial Calibration Date: 08-27-2009.

DF = Dilution Factor.

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: Conoco Phillips
Plant Name:
Unit/EPN: 39.1
Company Address:
City: Old Ocean | State: Tx | Zip:
Entech Proposal No.:
Entech Supervisor Name: Ed Pasternak
Entech Supervisor Signature:

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Number of Containers	Preservatives	Orsat	Methane / Ethane						Remarks:
E509-11-20832	Stack T1	G	11/17/09	1510	G	1	—	X	X						Turnaround Time:
															Detection Limits Required (Yes) No. Circle one, if Yes, describe below or include separate sheet detailing requirements.

GC#1

Person Taking Sample (a.-Print Name & b.-Signature)	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
See above for date and time a. Joseph Mac b.					Y	Y	Y	none
Received By (Signature):	**Date:**	**Time:**	**QAQC LAB acceptance checks. Place a Y or N after text**		**Container Type and volume OK?**	**Holding time OK?**	**Temperature OK?**	**Sample deficiencies - list on reverse. If none, write "none" in this box.**
	11-18-09	630	Y		✓	✓	Y	none

Sample Remainder Disposal
I Requested Lab To Dispose Of All Sample Remainders
Return Sample remainder to Entech Via:
(Signature) (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

f\templates\datasheets\field\chain of custody datasheets\chain of custody sheet.rev6 QAQC BACKUP.qpw 08/06

COC Lab Doc Number 803 | COC unfilled form controlled document number: COCRev6c

original ORIGINAL

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: ConocoPhillips
Plant Name: Sweeny Refinery
Unit/EPN: Unit 39.1 CEPN 39.1-95-1187
Company Address: HWY 35 & FM 524
City: Old Ocean | State: Tx | Zip: 77480

Entech Proposal No.: EP2009-06-39

Entech Supervisor Name: Ed Pasternak
Entech Supervisor Signature:

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Container Info. Number of Containers	Container Info. Preservatives	Analysis Parameters: Orsat	Analysis Parameters: Methane / Ethane
ES09-11-20851	Stack T2	C	11/18	1115	G	1	—	X	X
ES09-11-20852	Stack T3	C	11/18	1515	G	1	—	X	X

Remarks:

Turnaround Time:

Detection Limits Required: (Yes) No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Person Taking Sample (a.-Print Name & b.-Signature) See above for date and time	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
a. Joseph Matis b.					Y	Y	Y	none
Received By (Signature): Katie Mc	Date: Nov 19 2009	Time: 1233pm	QAQC LAB acceptance checks. Place a Y or N after text: Yes		Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
								none

Sample Remainder Disposal
I Requested Lab To Dispose Of All Sample Remainders
Return Sample remainder to Entech Via:
(Signature) (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

f\templates\datasheets\field\chain of custody datasheets\chain of custody sheet.rev6 QAQC BACKUP.qpw 08/06

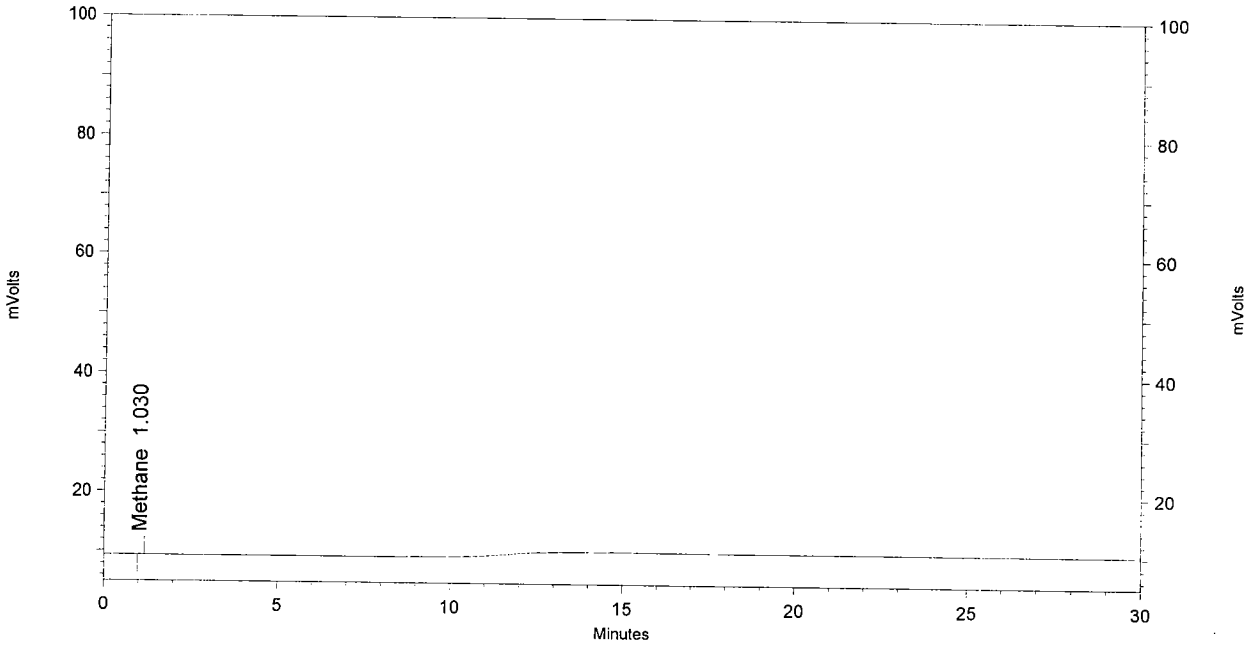
COC Lab Doc Number 805 | COC unfilled form controlled document number: COCRev6c

Original ORIGINAL

860

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20832 stack t1
FILE: E:\Sample\2009\ConocoPhillips Company\111709\20832r1.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/18/2009 10:35:21 PM
PRINTED: 11/19/2009 4:28:41 PM
USER: System

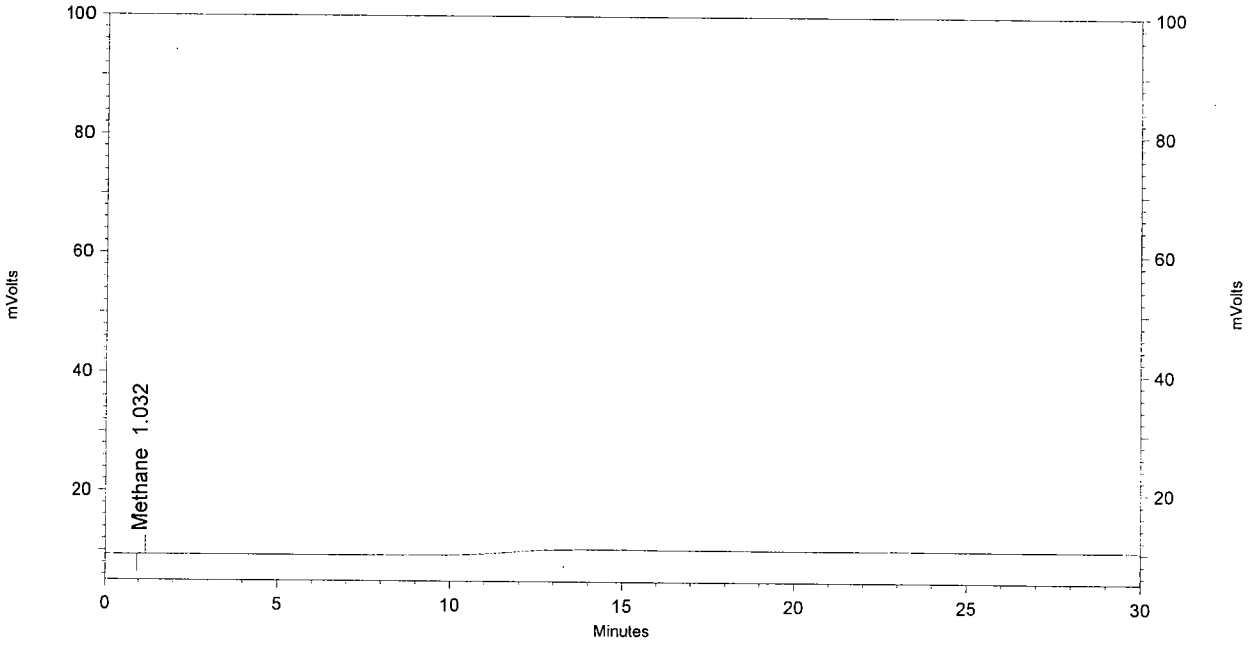


FID-2 Results

Name	Retention Time	Area
Methane	1.030	385
Totals		385

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20832 stack t1
FILE: E:\Sample\2009\ConocoPhillips Company\111709\20832r2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/18/2009 9:23:42 PM
PRINTED: 11/19/2009 4:44:10 PM
USER: System



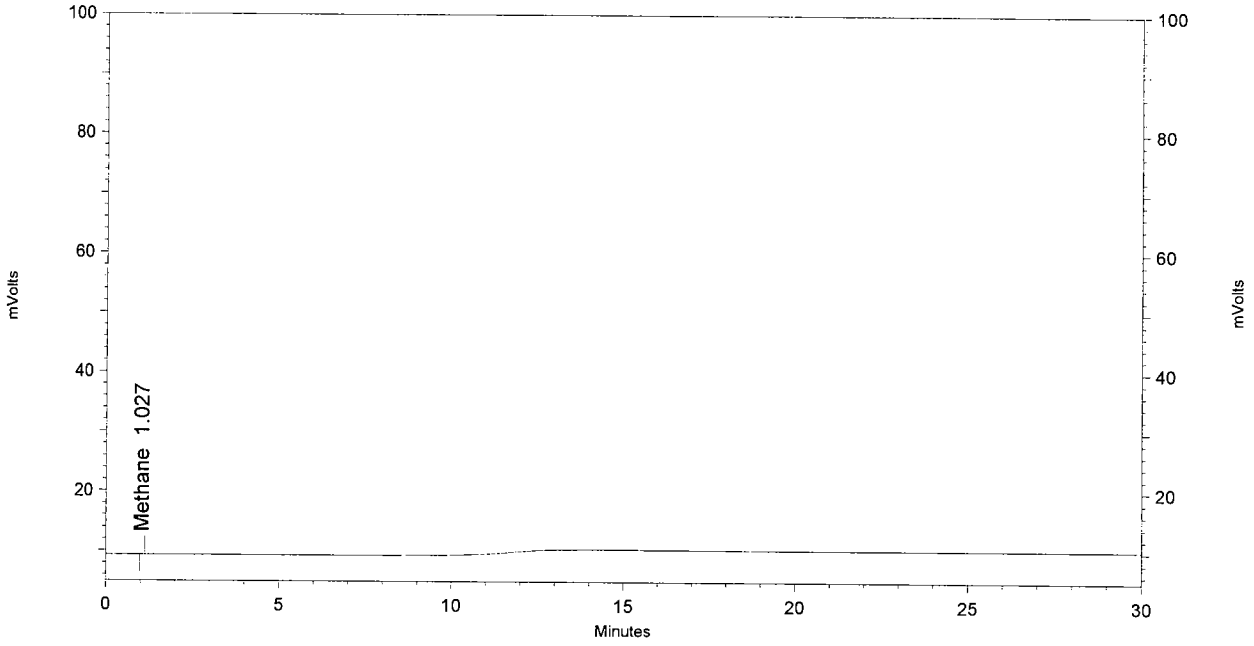
FID-2 Results

Name	Retention Time	Area
Methane	1.032	397
Totals		397

B62

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20832 stack t1
FILE: E:\Sample\2009\ConocoPhillips Company\111709\20832r3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/18/2009 10:01:22 PM
PRINTED: 11/19/2009 4:46:29 PM
USER: System

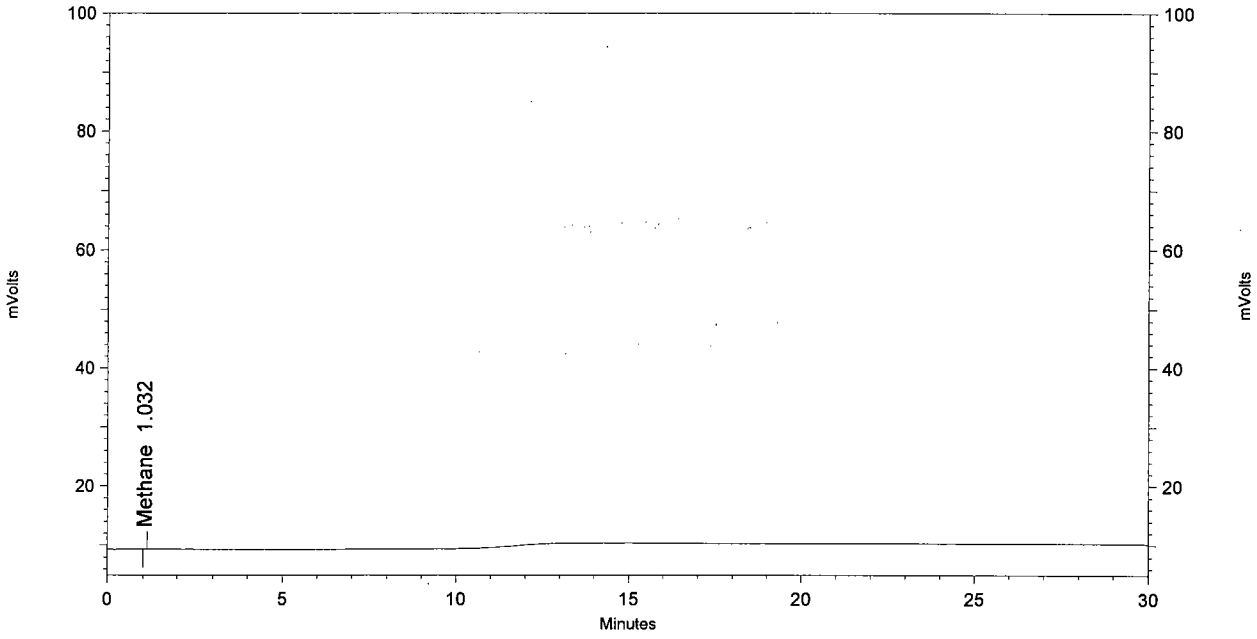


FID-2 Results

Name	Retention Time	Area
Methane	1.027	385
Totals		385

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20851 stack t2
FILE: E:\Sample\2009\ConocoPhillips Company\111809\20851r1.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 6:19:41 PM
PRINTED: 11/19/2009 6:19:59 PM
USER: System



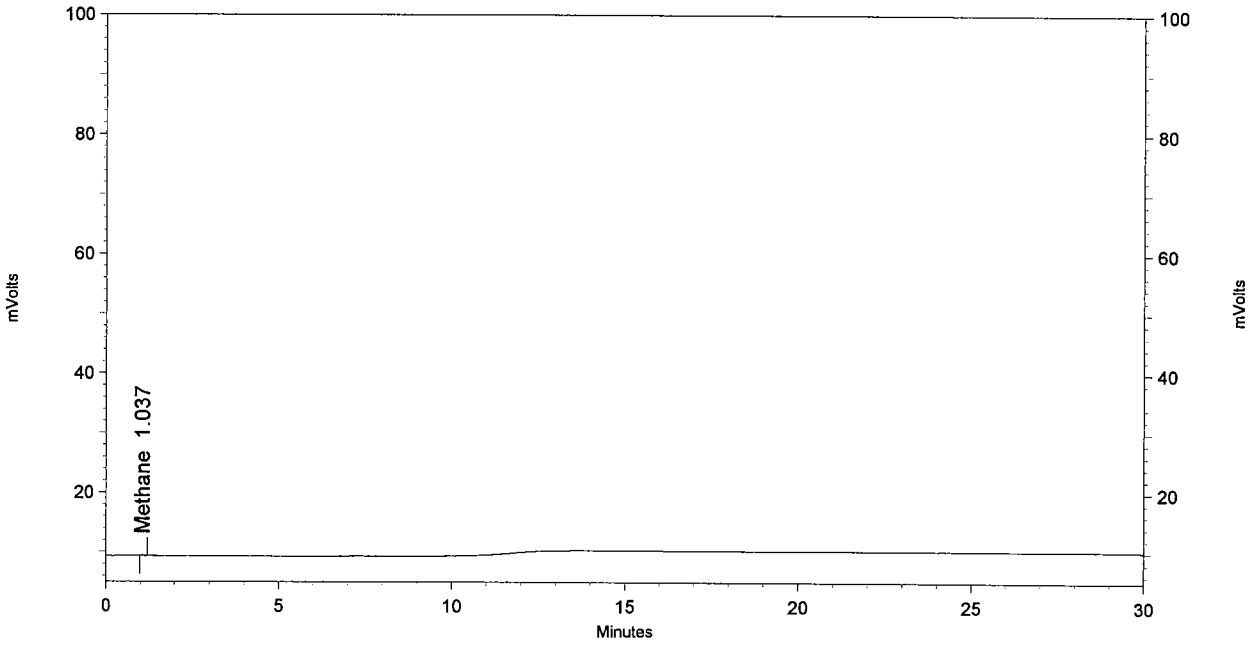
FID-2 Results

Name	Retention Time	Area
Methane	1.032	397
Totals		397

B64

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20851 stack t2
FILE: E:\Sample\2009\ConocoPhillips Company\111809\20851r2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 6:52:17 PM
PRINTED: 11/19/2009 6:52:30 PM
USER: System



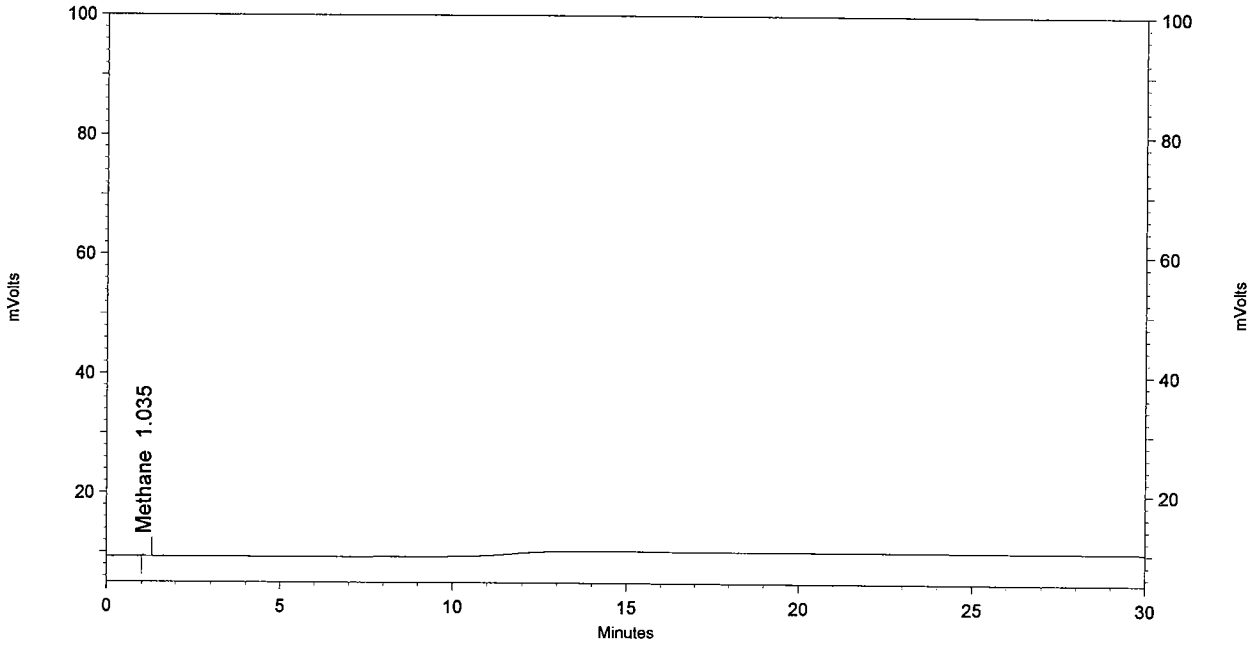
FID-2 Results

Name	Retention Time	Area
Methane	1.037	415
Totals		415

B-65

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 20851 stack t2
FILE: E:\Sample\2009\ConocoPhillips Company\111809\20851r3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 7:25:55 PM
PRINTED: 11/19/2009 7:26:07 PM
USER: System



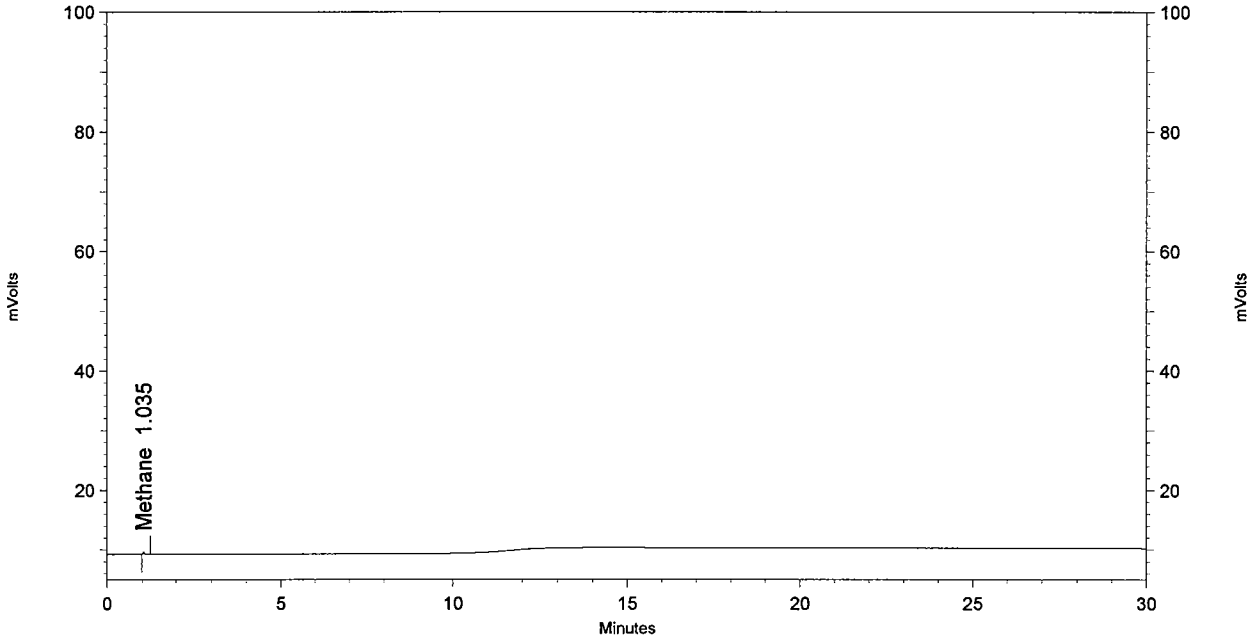
FID-2 Results

Name	Retention Time	Area
Methane	1.035	433
Totals		433

B66

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20852 stack t3
FILE: E:\Sample\2009\ConocoPhillips Company\111809\20852r1.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 7:59:53 PM
PRINTED: 11/19/2009 7:59:58 PM
USER: System



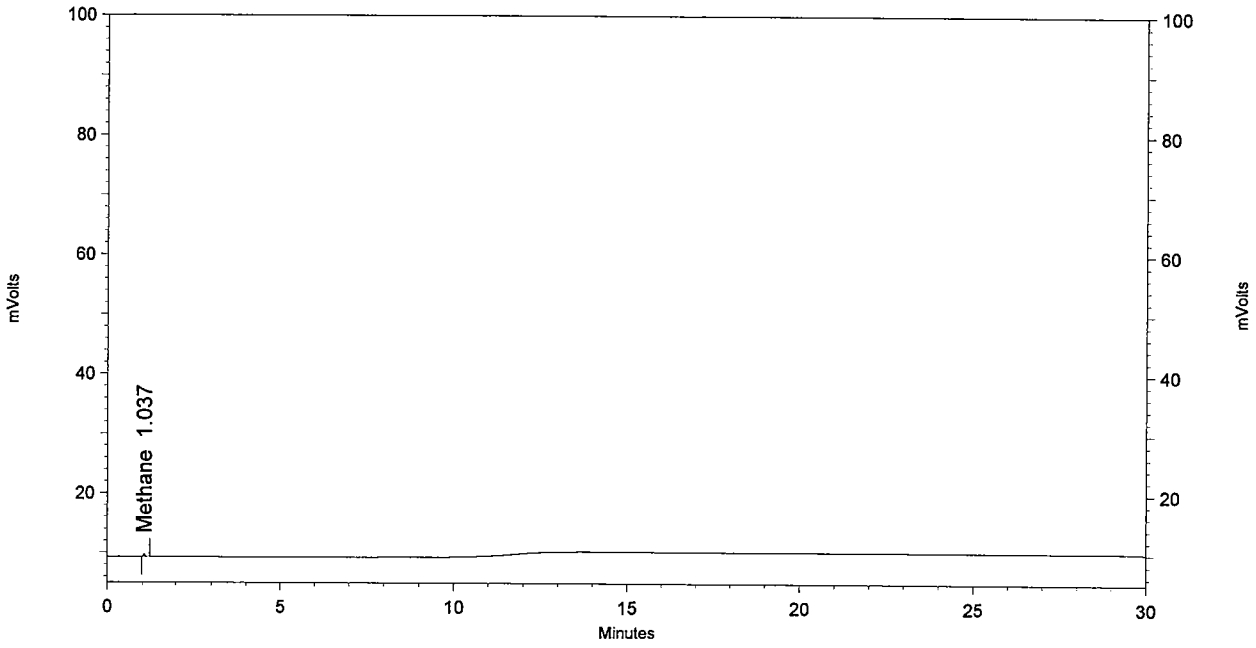
FID-2 Results

Name	Retention Time	Area
Methane	1.035	944
Totals		944

B67

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20852 stack t3
FILE: E:\Sample\2009\ConocoPhillips Company\111809\20852r2.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 8:33:25 PM
PRINTED: 11/19/2009 8:33:34 PM
USER: System



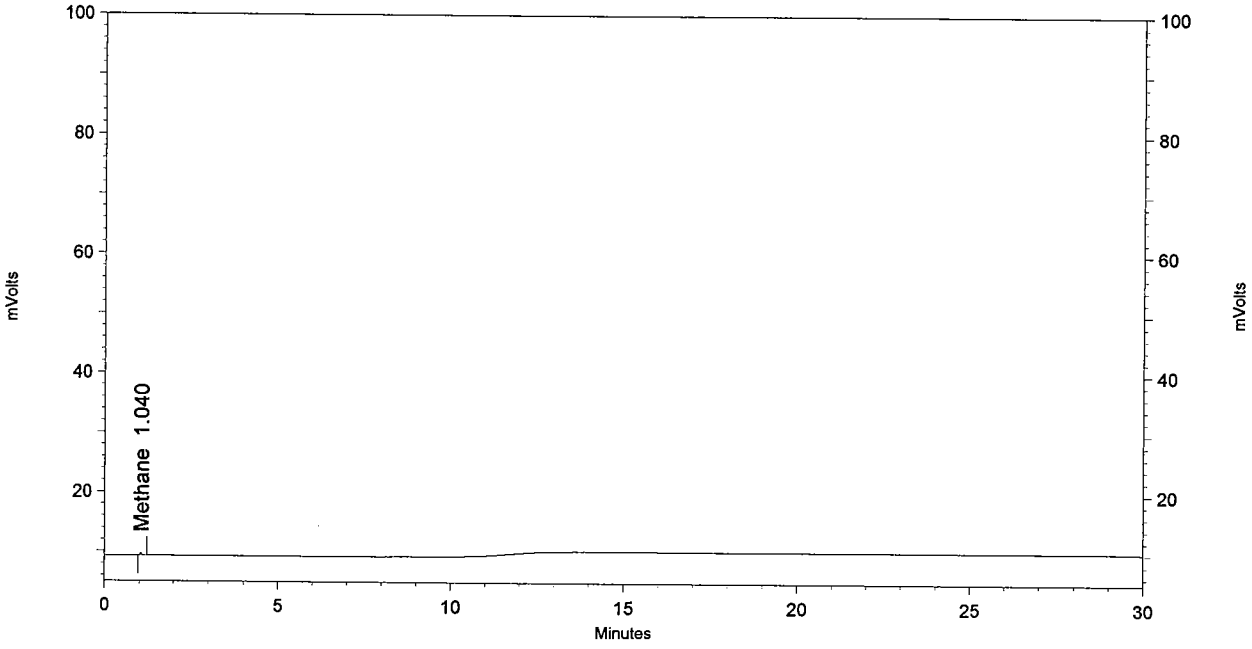
FID-2 Results

Name	Retention Time	Area
Methane	1.037	927
Totals		927

B68

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 20852 stack t3
FILE: E:\Sample\2009\ConocoPhillips Company\111809\20852r3.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 9:06:48 PM
PRINTED: 11/19/2009 9:06:54 PM
USER: System



FID-2 Results

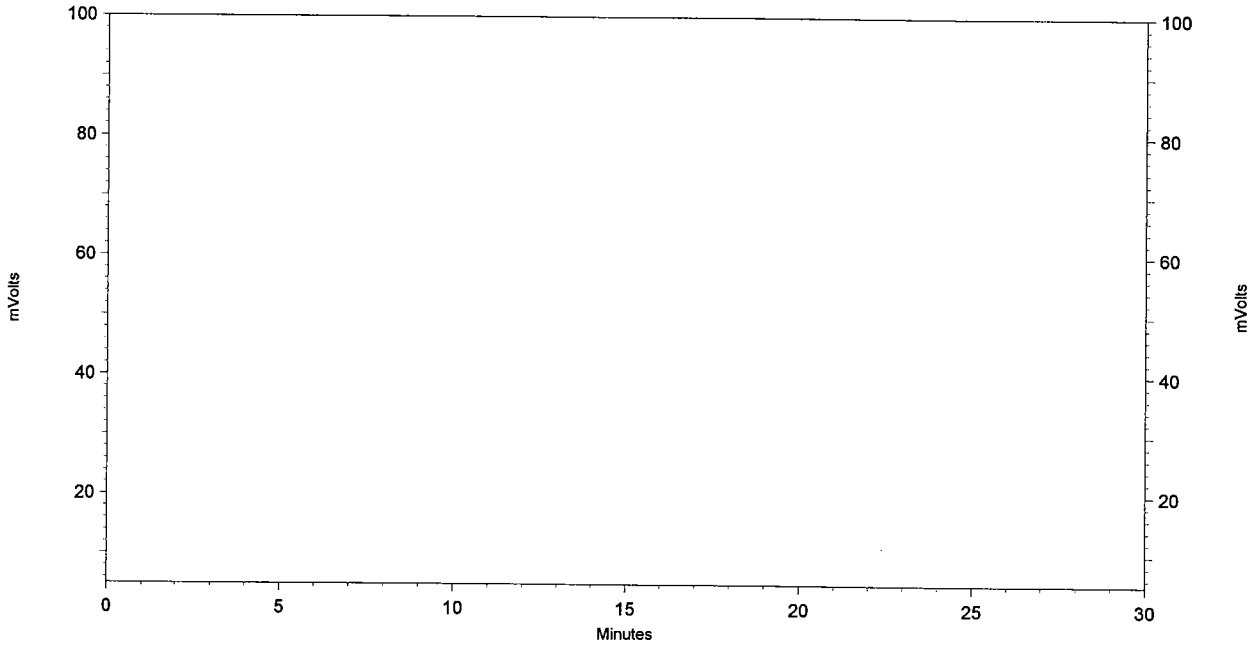
Name	Retention Time	Area
Methane	1.040	914
Totals		914

B69

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: blk
FILE: E:\Sample\2009\ConocoPhillips Company\111709\blkr1.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/18/2009 7:59:03 PM
PRINTED: 11/18/2009 7:59:17 PM
USER: System

FID



FID-2 Results

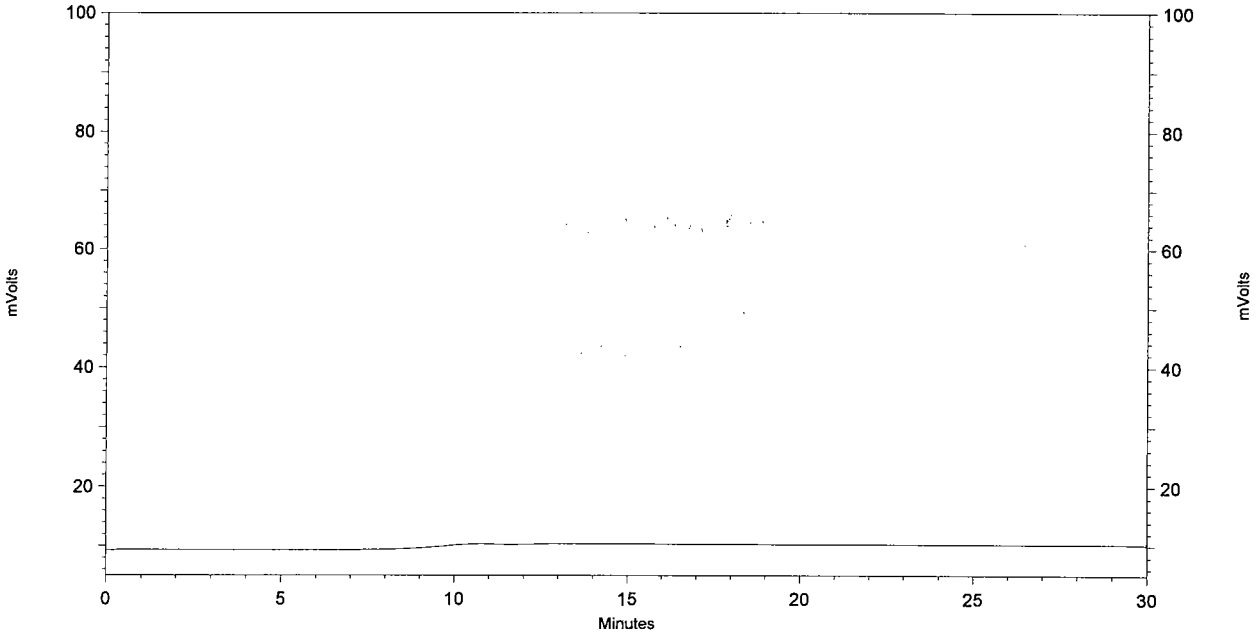
Name	Retention Time	Area

B 70

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: blk
FILE: E:\Sample\2009\ConocoPhillips Company\111809\blk.dat
METHOD E:\Calibration\GC#1\FID-2 paraffin 30min.met
ACQUIRED: 11/19/2009 5:46:48 PM
PRINTED: 11/19/2009 5:47:02 PM
USER: System

710



FID-2 Results

Name	Retention Time	Area

B 71

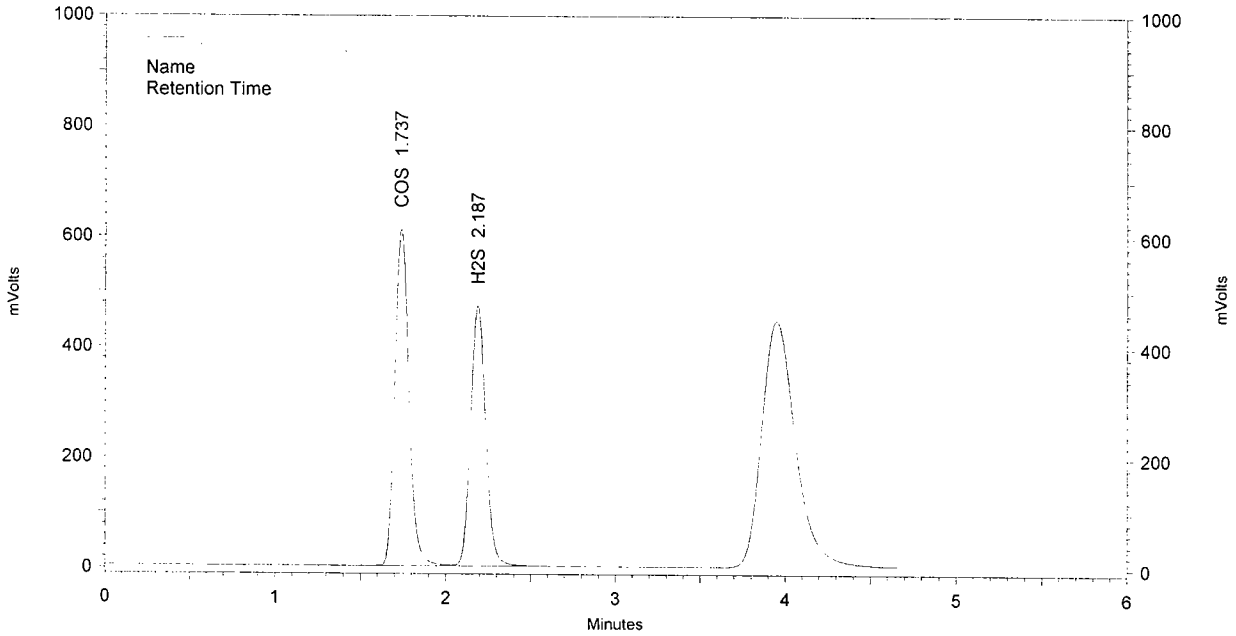
Sulfur Analysis - GC / FPD

Column Resolution Check

(EPA method 15)

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: 5ppm @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\Std_Resolution Chk.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD.met
ACQUIRED: 11/17/2009 10:24:25 AM
PRINTED: 11/17/2009 10:29:04 AM
USER: System

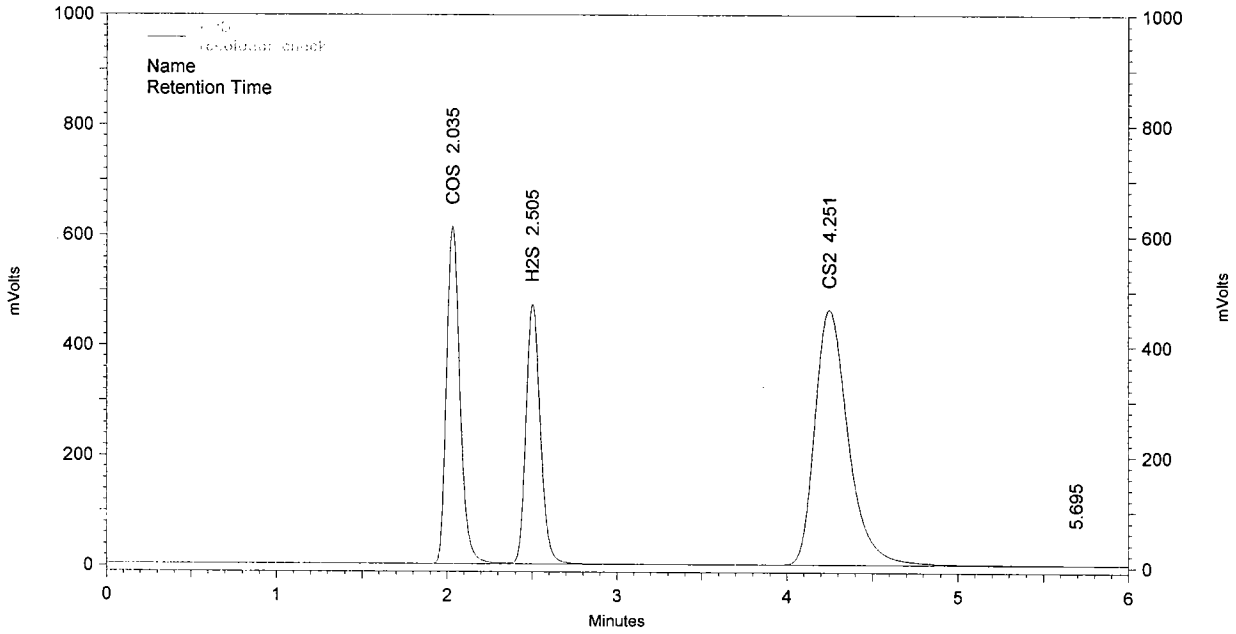


FPD Results

Name	Retention Time	Area
COS	1.737	3508864
H2S	2.187	2878128
Totals		6386992

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: resolution check
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\res_chk.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 8:47:27 AM
PRINTED: 11/18/2009 8:56:11 AM
USER: System



FPD Results

Name	Retention Time	Area
COS	2.035	3402408
H2S	2.505	2806964
CS2	4.251	6332231
	5.695	6766

Totals		12548369

Sulfur Analysis - GC / FPD

Pre-Test Calibration

(EPA method 15)

B-75

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Chromatography Data Sheet

Gas Chromatograph Information

GC Type:	Shimadzu GC-14A		
Detector:	Photo Ionization Detector (FPD). Channel: A		
GC ID #:	6	DAS:	Shimadzu EZChrom
GC Serial #:	C10552911593		
Column Type:	Chromosil 310 Column, 8'x1/8" OD Teflon.		
Date in Service:	Oct. 14, 2005	Cond.:	Used
Location:	Entech GC Lab		

Gas Chromatograph Operating Parameters

GC Oven Temperature Parameters:			
Isothermal Column Temperature (C):	37	Injector Temperature (C):	220
Initial Column Temperature (C):	37	Detector Temperature (C):	220
Duration of initial temperature (min):	na	TCD Oven Temperature (C):	na
Program Rate (C/min):	na	Methanizer Temperature (C):	na
Final Temperature (C):	na		
Final Time (min):	na		
Carrier Gas Mass Flow Setting (Kpa):	100	Carrier Gas Type:	Nitrogen
Air Flow (Kpa):	50	Hydrogen Flow (Kpa)	50
Detector Range:	2	Back-flush Time (min):	NA
Sample Size (ul):	250	TCD Bridge Current (mA):	NA

Calibration Data

ID	Retention Time (min)	ID Time Band (+/- min)	Regression Data: y = mx + b Where: x = Area & y = molar ppm Range	m	b	r

* See Data Calculations Section

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data

GC #6 FPD (Range 2)

H_2S Standard - Dynacalibrator

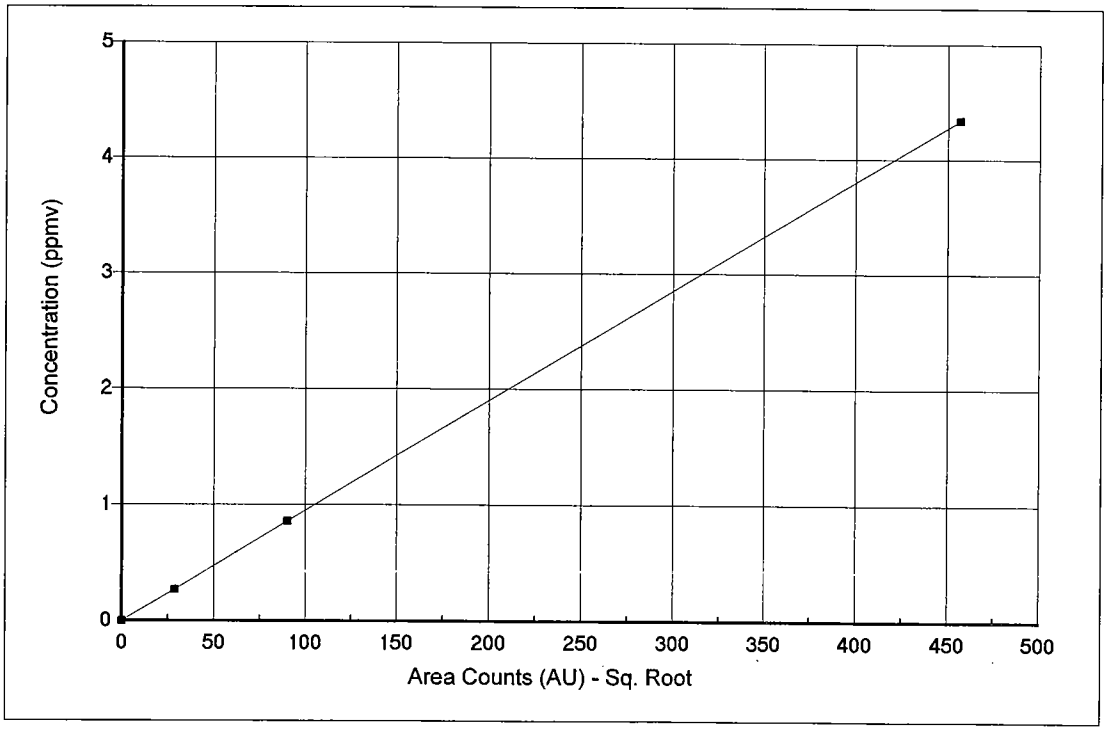
11/17/09

(Retention Time = 2.49 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Avg. Area (Square Root) (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
0.27	819	826	827	28.7	0.60%
0.86	8139	8131	8140	90.2	0.07%
4.34	209378	212058	204178	456.7	2.79%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.002
R Squared	0.999999
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	9.504556E-03
Std Err of Coef.	4.825793E-06

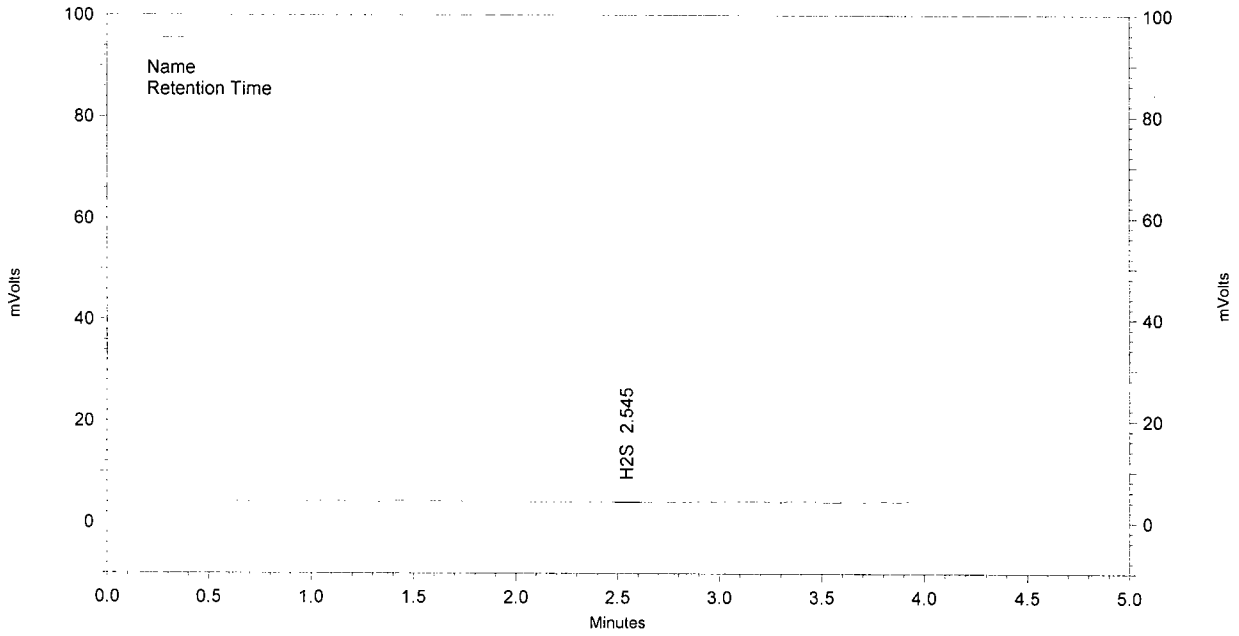


Permeation Device: Metronics Dynacal H2S Rate: 3590 ng/ml @ 30C

Operator _____ Date 11-18-09

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: Dyna Set 8 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET8_R1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:07:16 AM
PRINTED: 11/17/2009 11:22:35 AM
USER: System



FPD Results

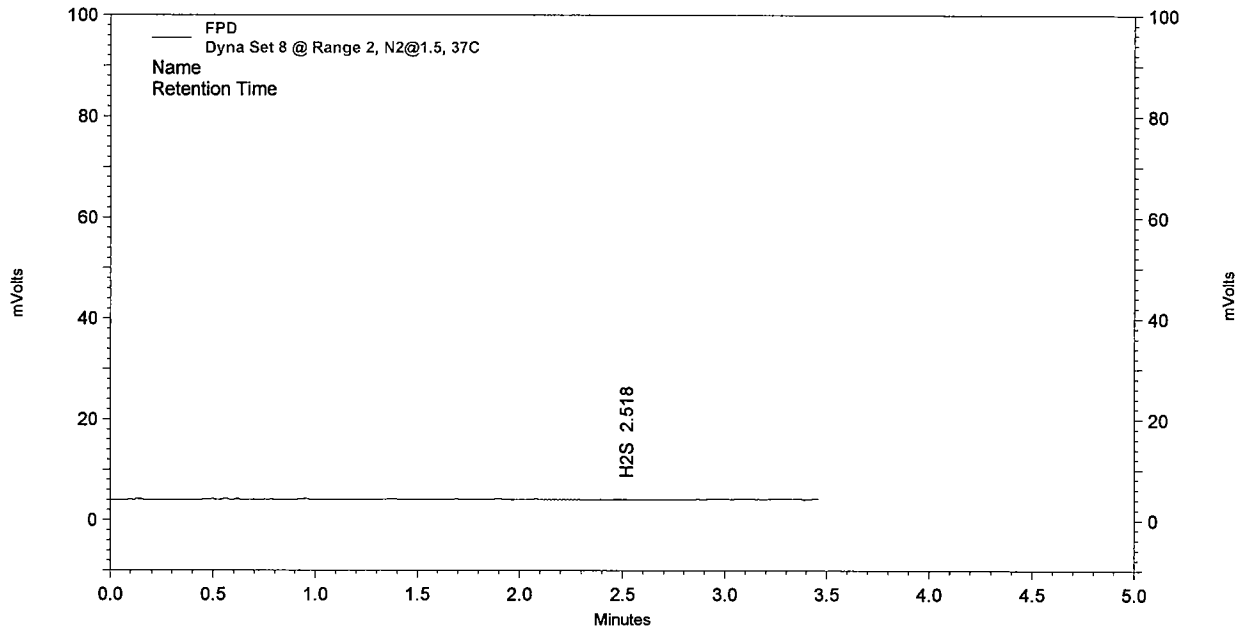
Name	Retention Time	Area
H2S	2.545	819

Totals		819

B 78

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: Dyna Set 8 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709ical\H2S_SET8_R2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:12:16 AM
PRINTED: 12/2/2009 4:40:10 PM
USER: System

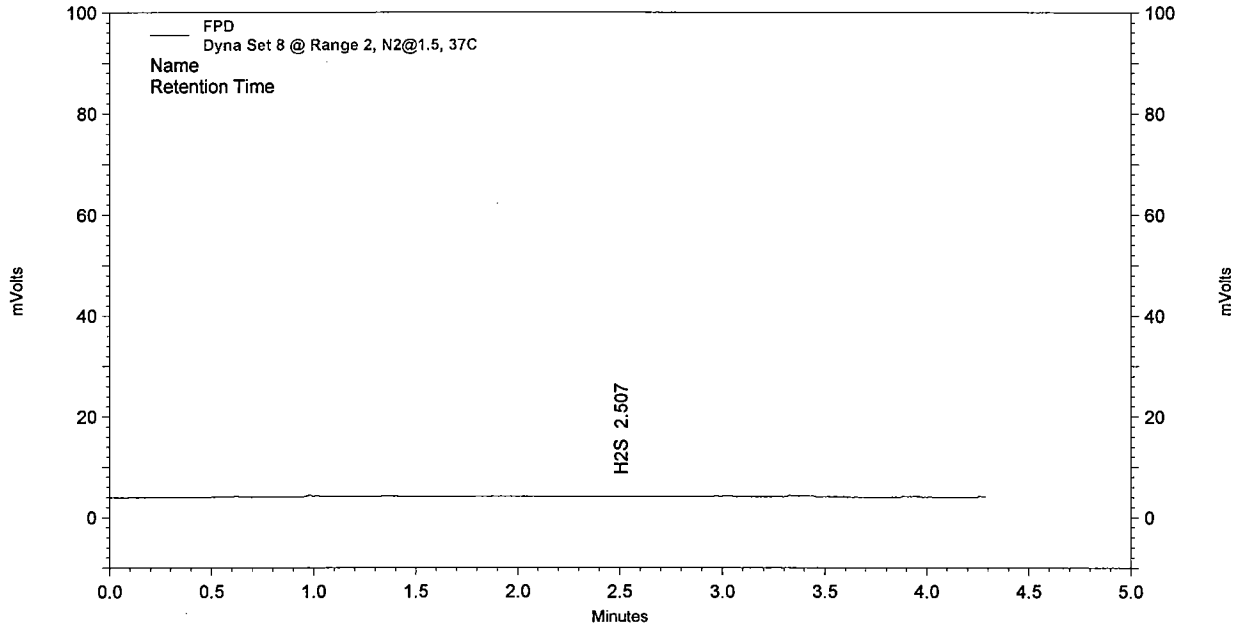


FPD Results

Name	Retention Time	Area
H2S	2.518	826
Totals		826

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: Dyna Set 8 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709ical\H2S_SET8_R3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:16:29 AM
PRINTED: 12/2/2009 4:36:54 PM
USER: System



FPD Results

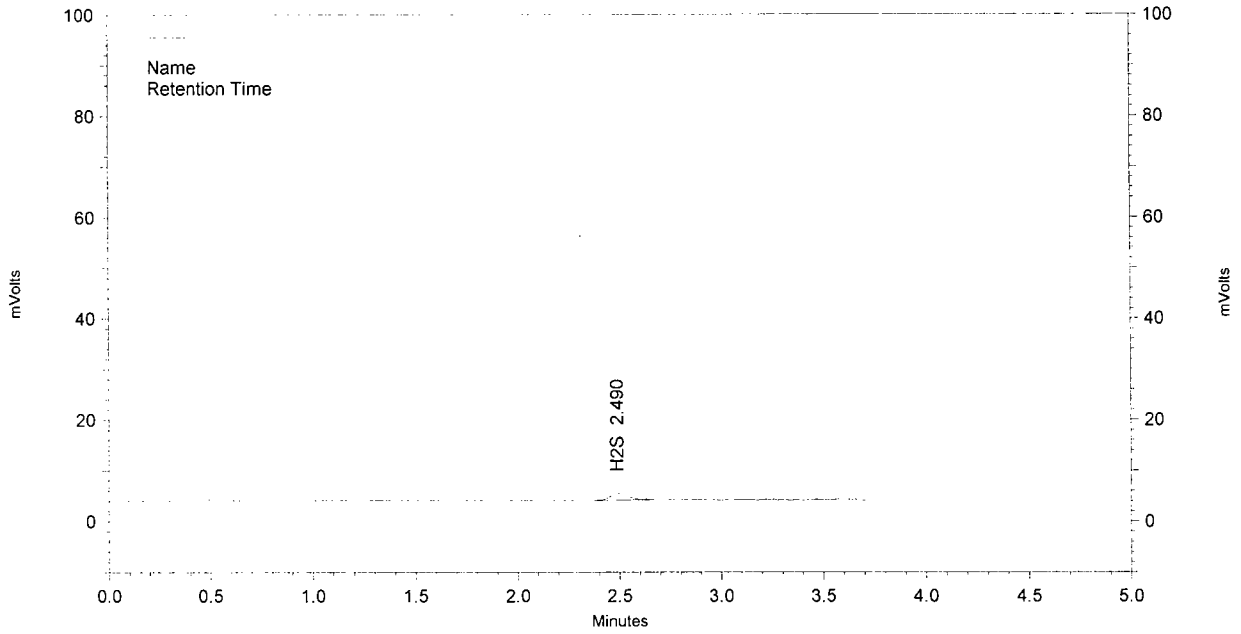
Name	Retention Time	Area
H2S	2.507	827

Totals		827

B 80

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: Dyna Set 3 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET3_RR1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:47:31 AM
PRINTED: 11/17/2009 11:51:13 AM
USER: System



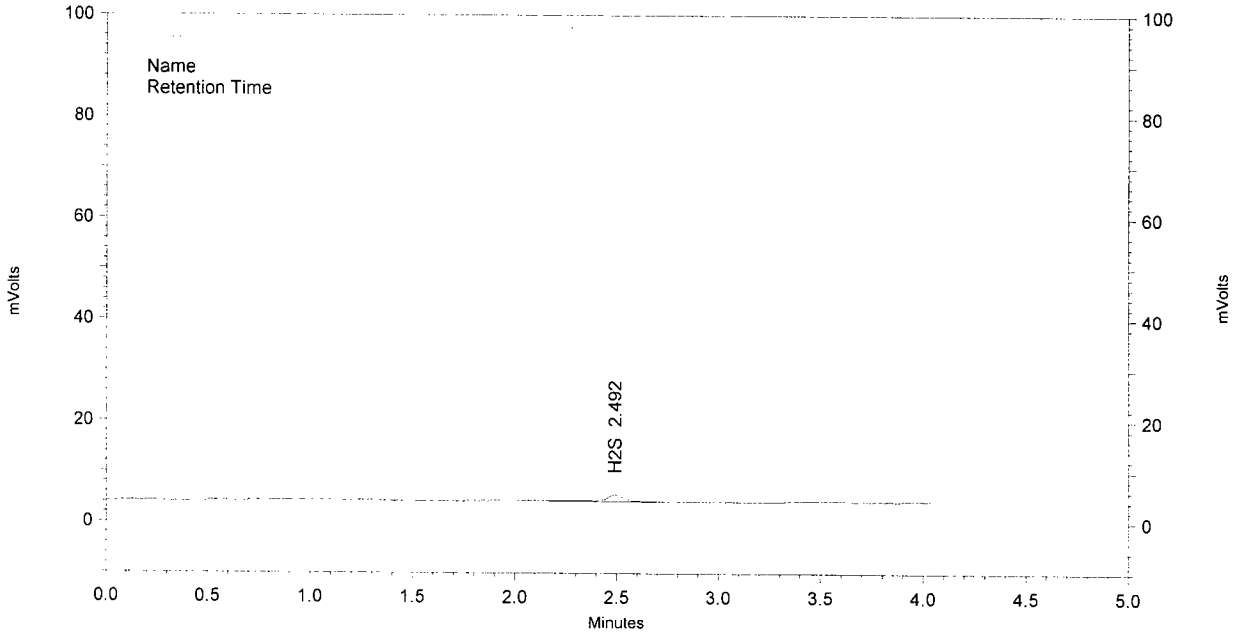
FPD Results

Name	Retention Time	Area
H2S	2.490	8139

Totals		8139

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: Dyna Set 3 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET3_RR2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:51:47 AM
PRINTED: 11/17/2009 11:55:49 AM
USER: System

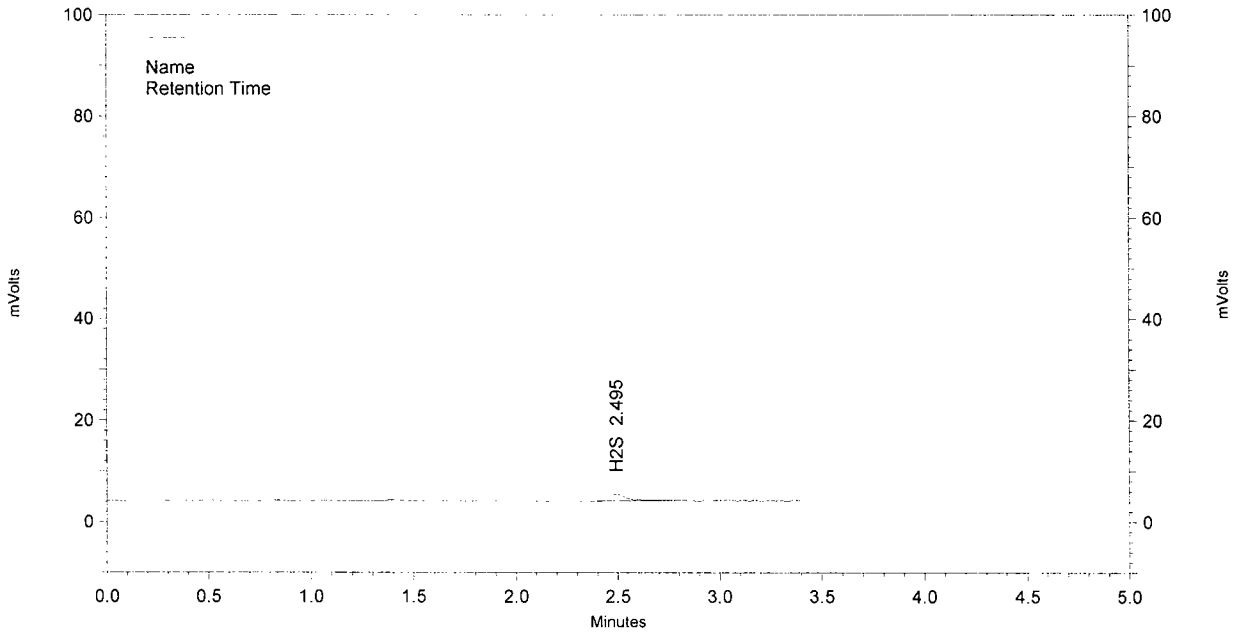


FPD Results

Name	Retention Time	Area
H2S	2.492	8131
Totals		8131

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: Dyna Set 3 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET3_RR3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:56:15 AM
PRINTED: 11/17/2009 11:59:39 AM
USER: System



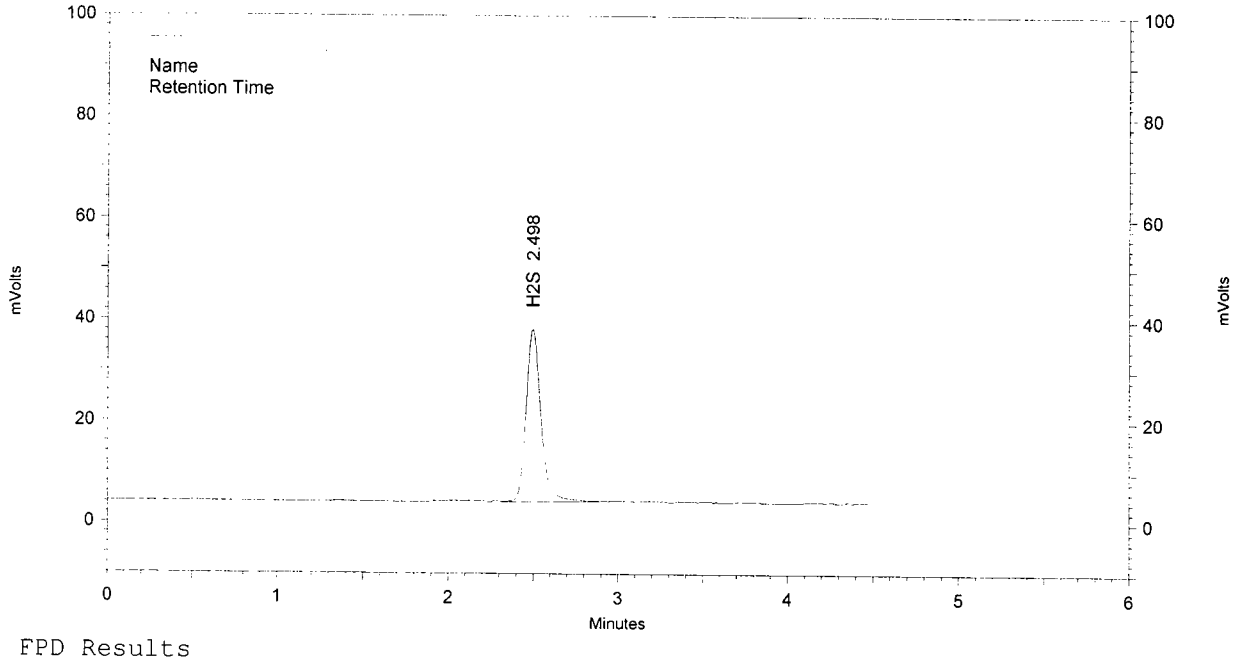
FPD Results

Name	Retention Time	Area
H2S	2.495	8140

Totals		8140

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: Dyna Set 1 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET1_R1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 10:40:25 AM
PRINTED: 11/17/2009 10:44:53 AM
USER: System

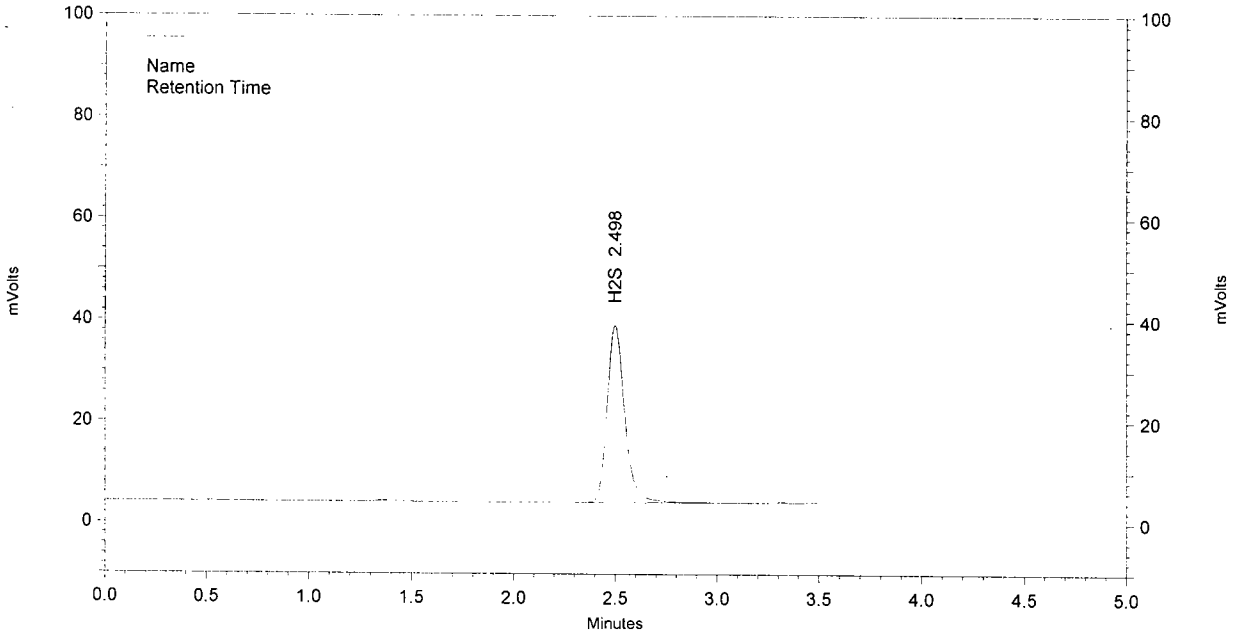


FPD Results

Name	Retention Time	Area
H2S	2.498	209378
Totals		209378

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: Dyna Set 1 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET1_R4.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 10:56:14 AM
PRINTED: 11/17/2009 10:59:47 AM
USER: System



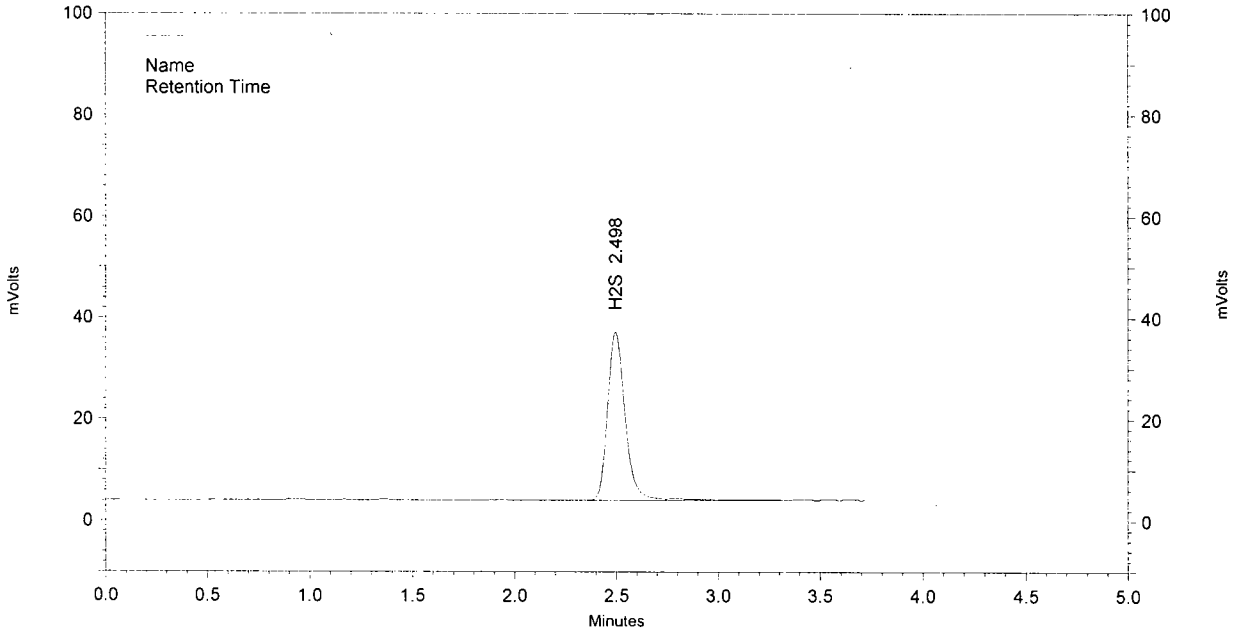
FPD Results

Name	Retention Time	Area
H2S	2.498	212058
Totals		212058

B85

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: Dyna Set 1 @ Range 2, N2@1.5, 37C
FILE: E:\GC DATA\2009\Calibration\GC#6\111709\H2S_SET1_R5.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 11:00:07 AM
PRINTED: 11/17/2009 11:03:49 AM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.498	204178

Totals		204178

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data

GC #6 FPD (Range 2)

H_2S Standard - Dynacalibrator

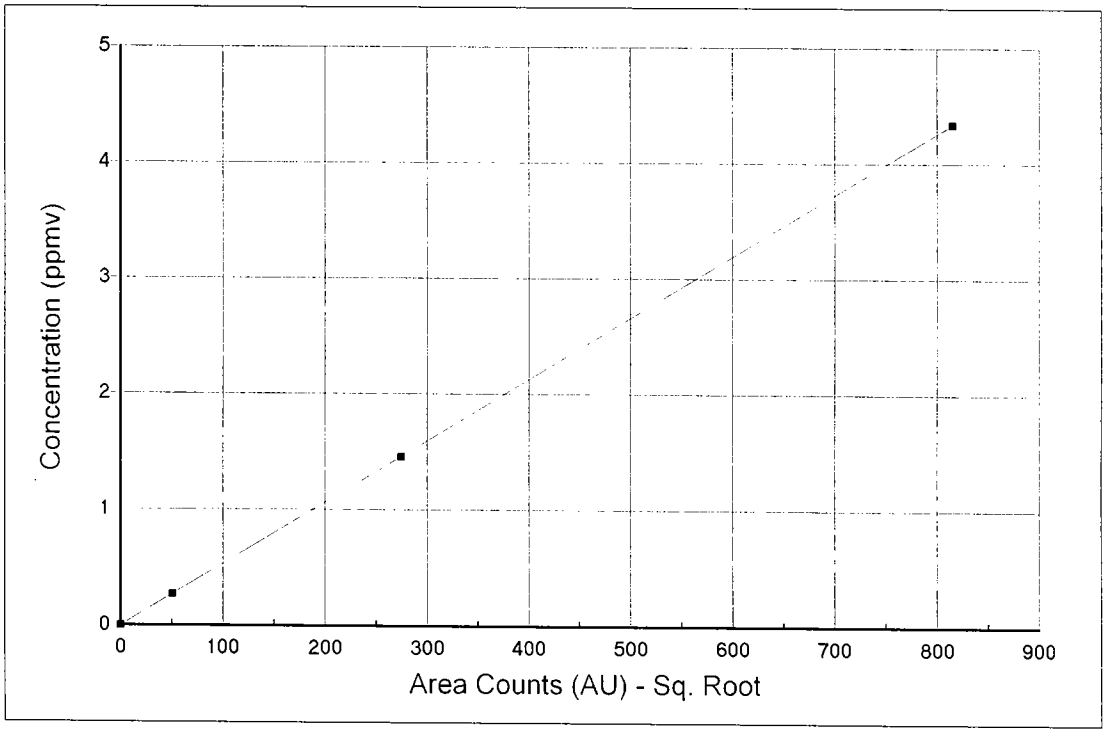
11/18/09

(Retention Time = 2.49 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Avg. Area (Square Root) (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
0.27	2600	2558	2578	50.8	0.90%
1.46	75391	75246	75444	274.5	0.10%
4.34	659483	666388	666240	814.9	0.30%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.001
R Squared	1.000000
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	5.325114E-03
Std Err of Coef.	1.337038E-06

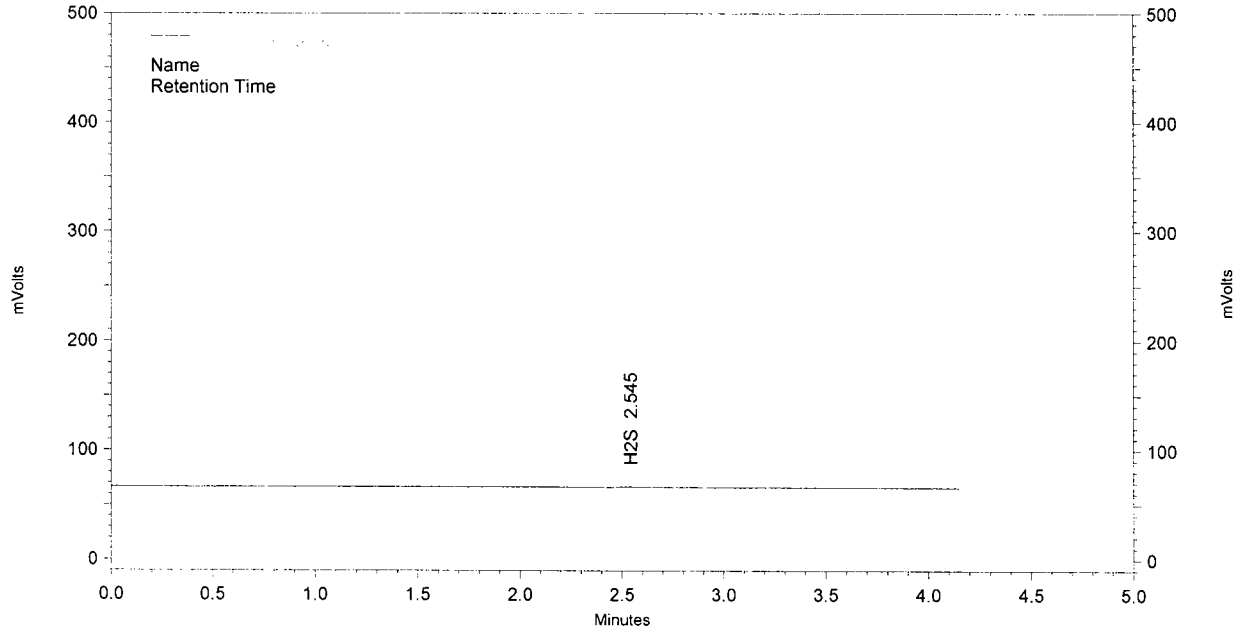


Permeation Device: Metronics Dynacal H2S Rate: 3590 ng/ml @ 30C

Operator SLG Date 11-18-09 B87

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET8
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET8R1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 10:21:04 AM
PRINTED: 11/18/2009 10:43:53 AM
USER: System



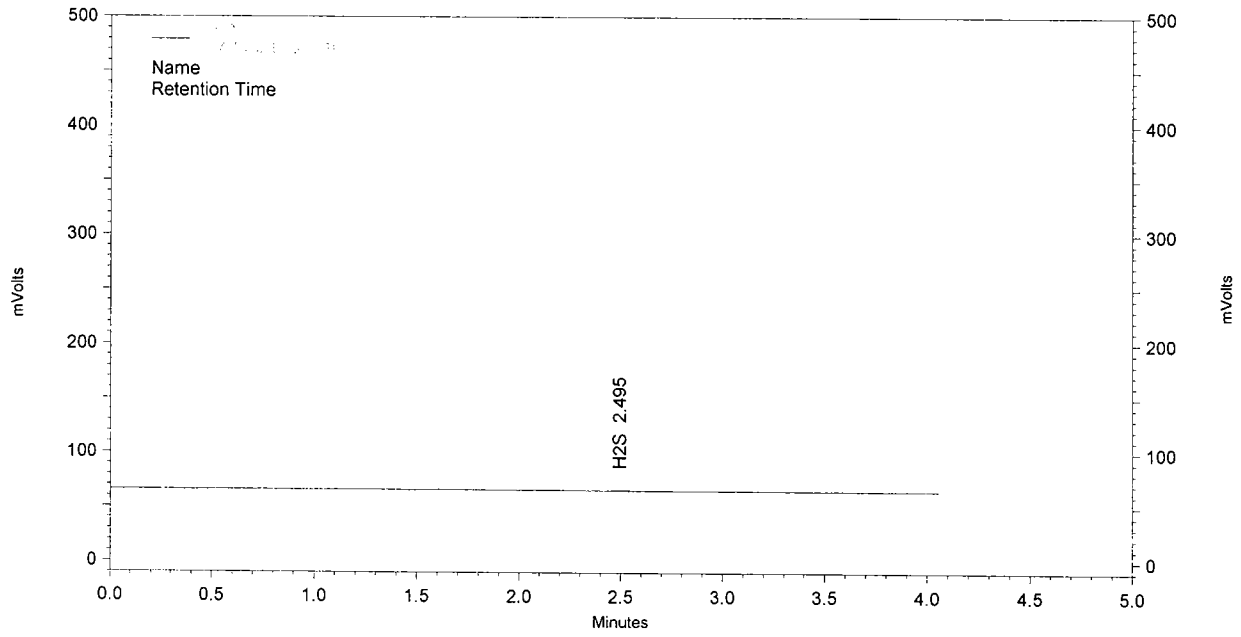
FPD Results

Name	Retention Time	Area
H2S	2.545	2600

Totals		2600

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET8
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET8R2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 10:25:36 AM
PRINTED: 11/18/2009 10:30:47 AM
USER: System

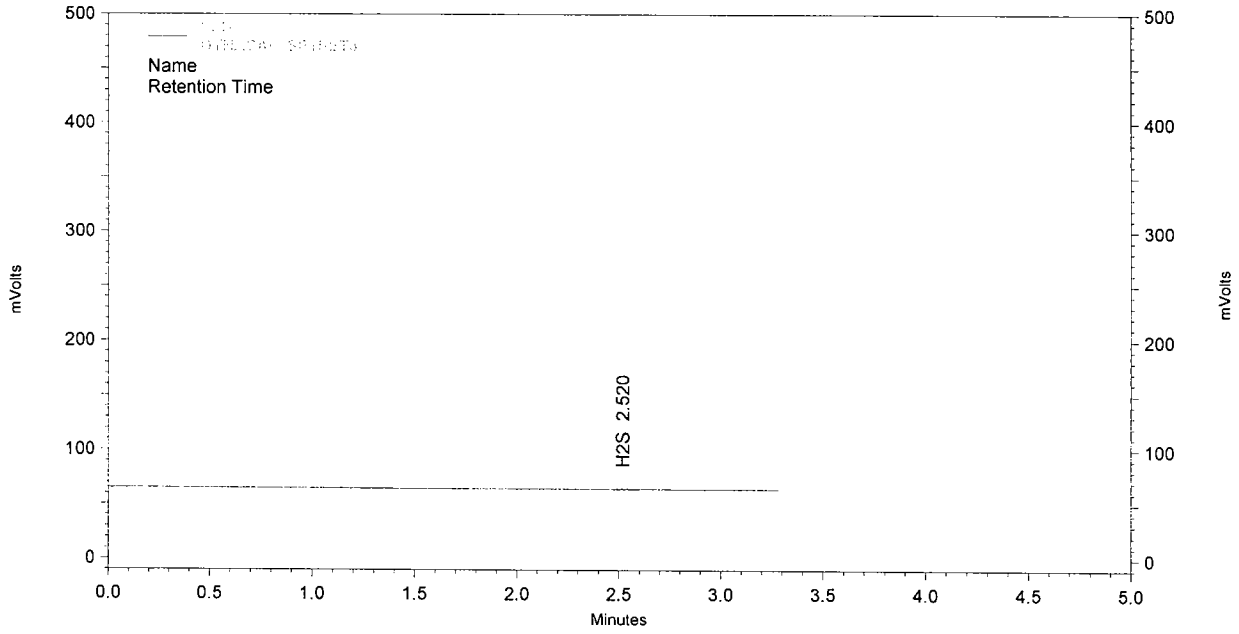


FPD Results

Name	Retention Time	Area
H2S	2.495	2558
Totals		2558

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET8
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET8R3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 10:31:19 AM
PRINTED: 11/18/2009 10:34:36 AM
USER: System



FPD Results

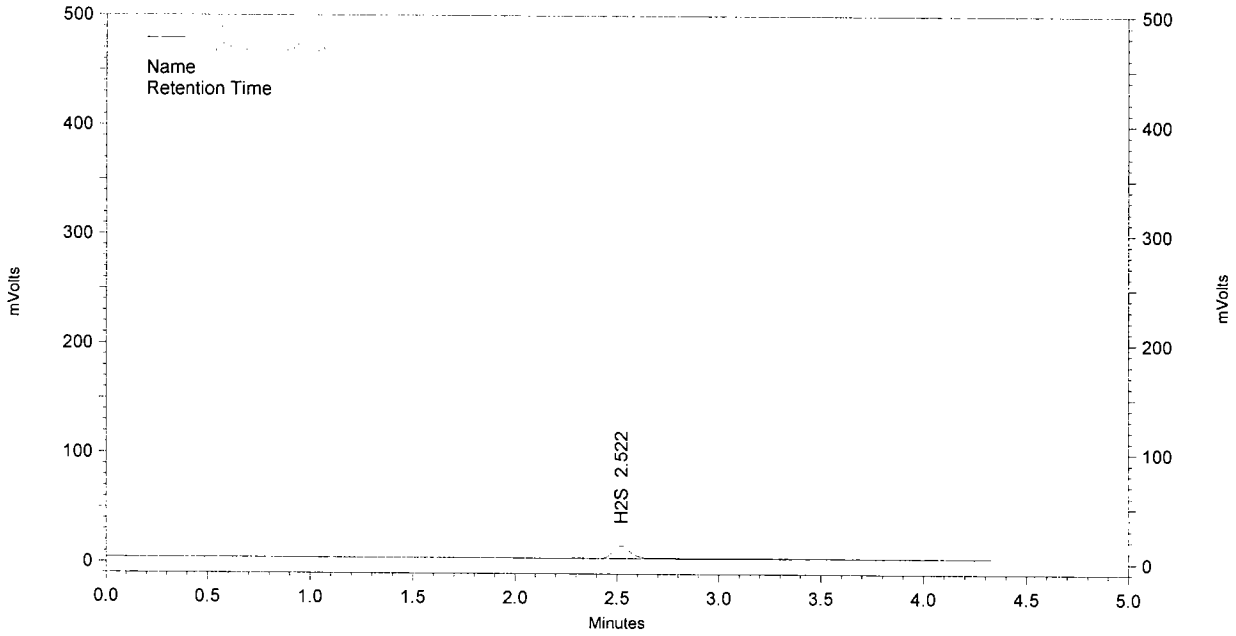
Name	Retention Time	Area
H2S	2.520	2578

Totals		2578

B 90

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET2
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET2R2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 9:52:15 AM
PRINTED: 11/18/2009 10:03:39 AM
USER: System

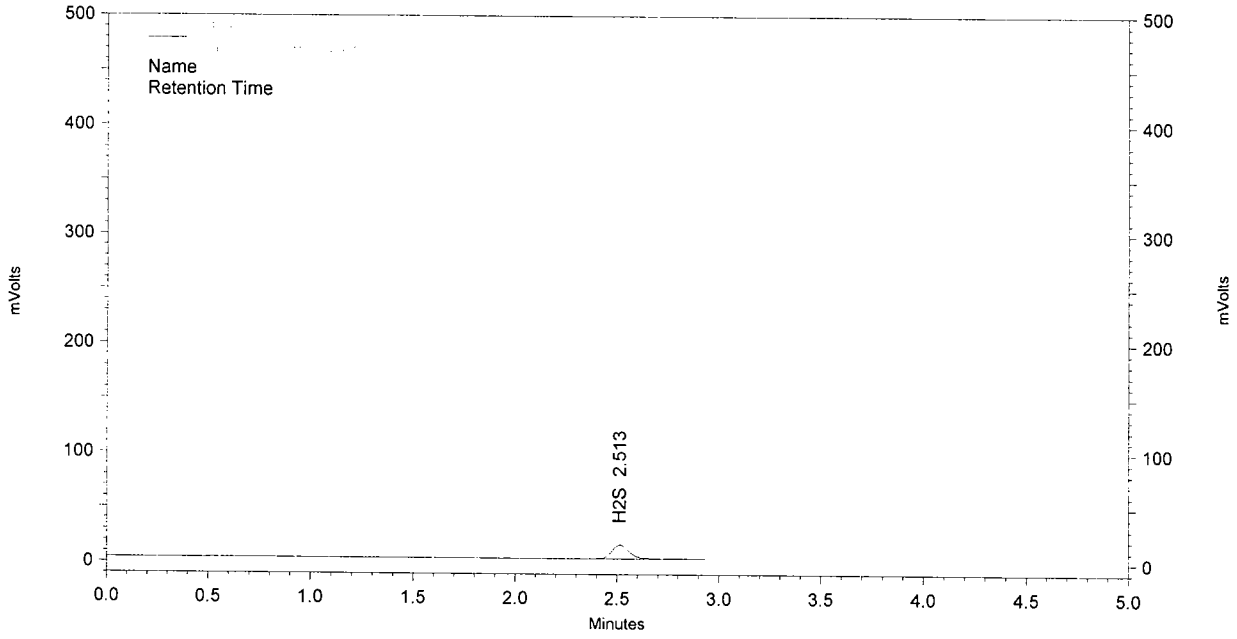


FPD Results

Name	Retention Time	Area
H2S	2.522	75246
Totals		75246

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET2
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET2R3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 9:48:13 AM
PRINTED: 11/18/2009 10:04:41 AM
USER: System

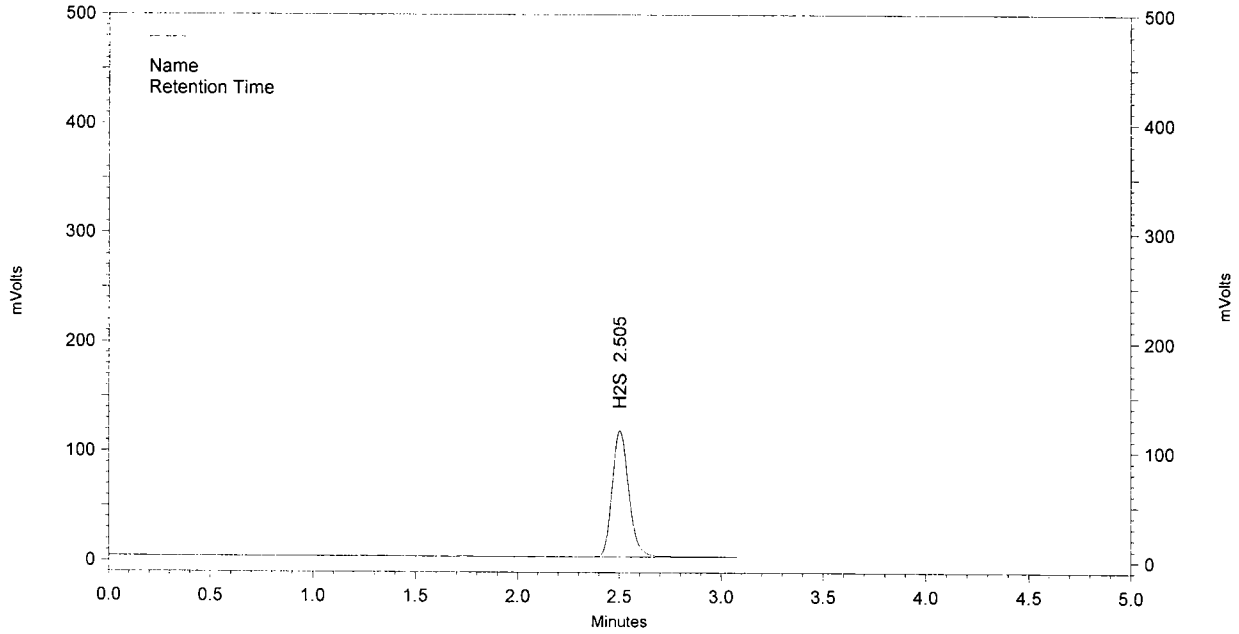


FPD Results

Name	Retention Time	Area
H2S	2.513	75444
Totals		75444

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET1
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET1R2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 9:13:04 AM
PRINTED: 11/18/2009 9:36:53 AM
USER: System

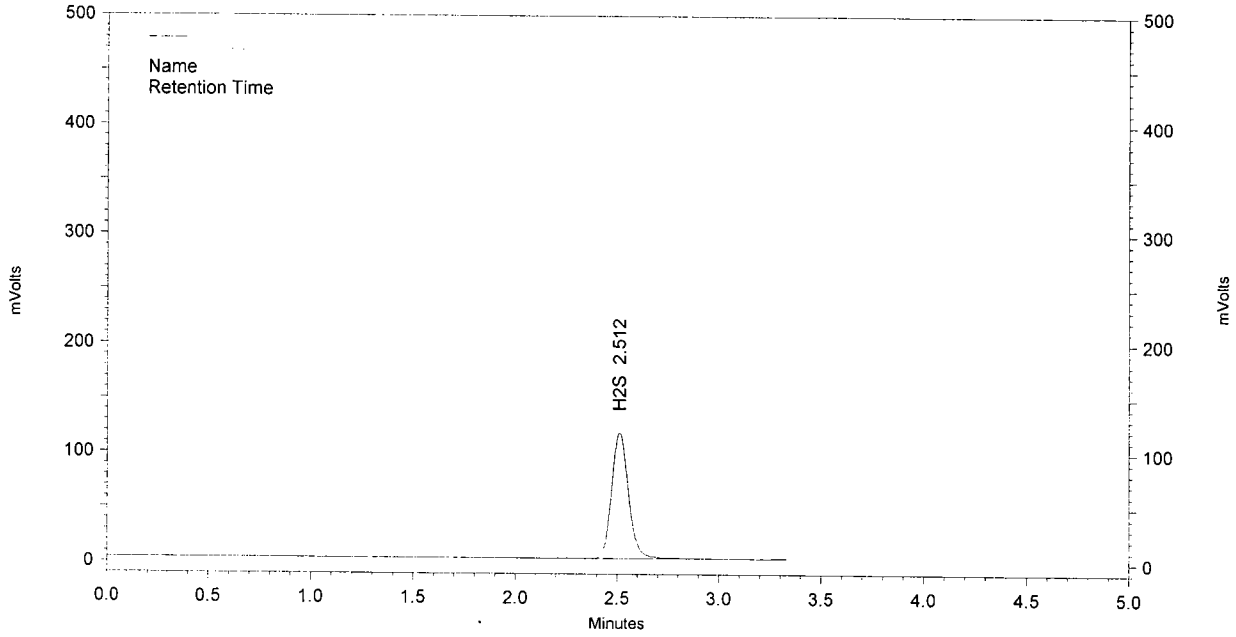


FPD Results

Name	Retention Time	Area
H2S	2.505	659483
Totals		659483

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET1
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET1R6.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 9:29:06 AM
PRINTED: 11/18/2009 9:32:34 AM
USER: System

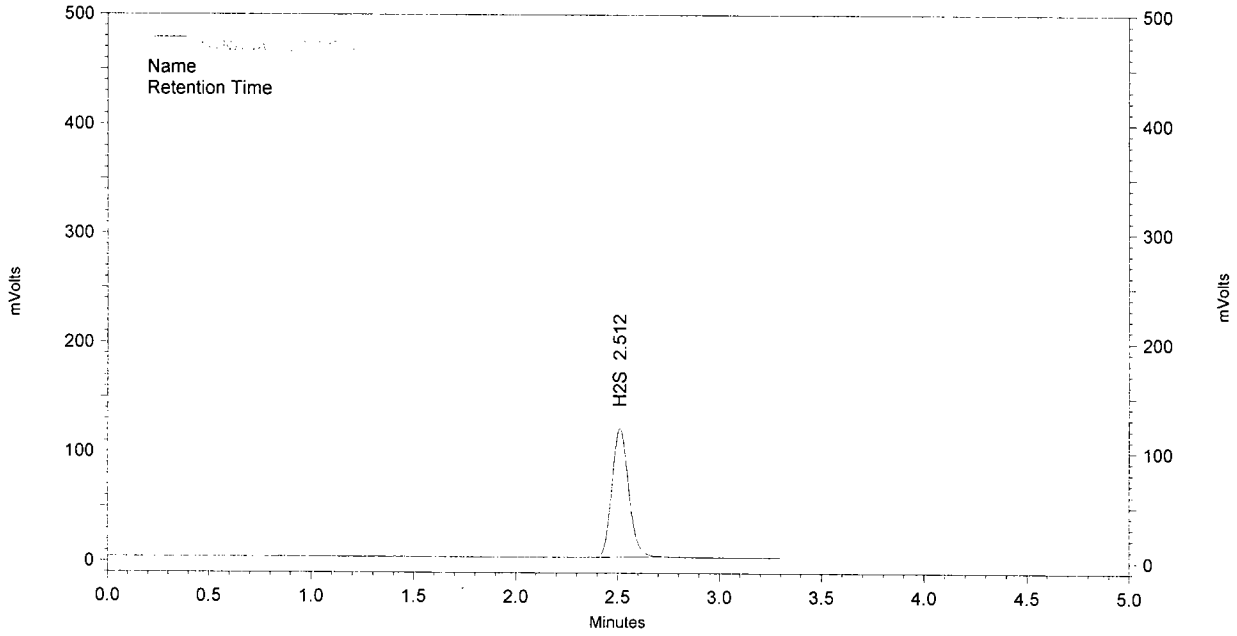


FPD Results

Name	Retention Time	Area
H2S	2.512	666388
Totals		666388

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: DYNACAL_SP1SET1
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\SP1SET1R7.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 9:32:57 AM
PRINTED: 11/18/2009 9:37:19 AM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.512	666240

Totals		666240

Sulfur Analysis - GC / FPD

Post-Test Calibration

(EPA method 15)

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC #6 FPD Analysis - Initial Calibration: November 17, 200

H_2S Standards Post Check Result - November 17, 2009

(FPD@Range 2)

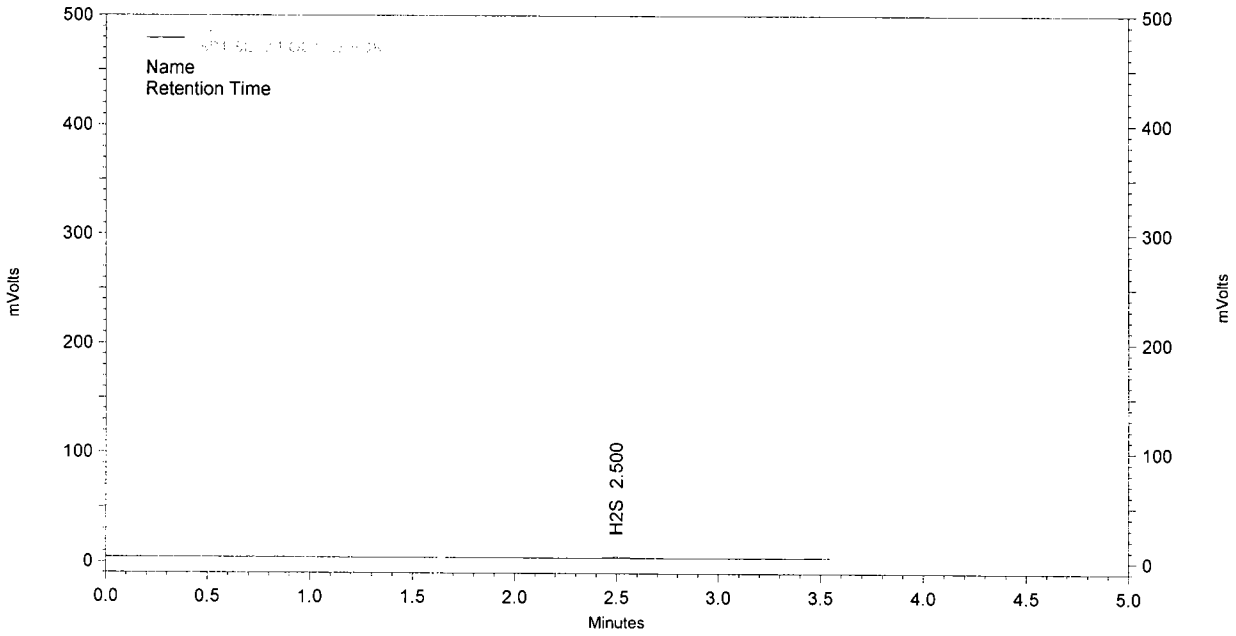
		Area Counts	Concentration
Sample ID No.	GC Run No.	H2S	H2S
		area counts (sq. root)	0.86
Initial Cal. Standard Avg.		90.2	ppmv
Calibration Post-Check Run	1	91	0.86
	2	91	0.86
	3	91	0.86
		Average =	0.9
		Standard Response Factor =	104.88
		QA Response Factor =	105.57
		Mean Response Factor =	105.23
		Percent Difference, % =	0.65
		Pass/Fail Criterion (<5%) =	Pass

Operator SLY Date 11-17-09

B-97

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: SP1 SET3 POST CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\POSTCHK1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 6:57:04 PM
PRINTED: 11/17/2009 7:01:30 PM
USER: System

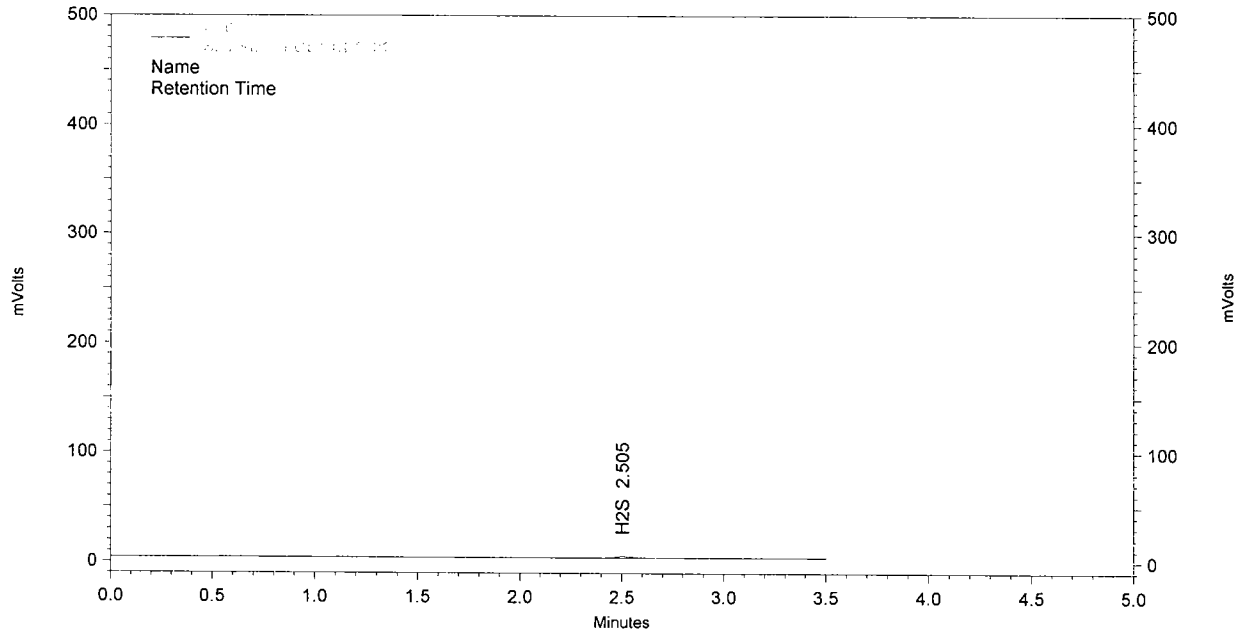


FPD Results

Name	Retention Time	Area
H2S	2.500	8216
Totals		8216

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: SP1 SET3 POST CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\POSTCHK2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 6:51:58 PM
PRINTED: 11/17/2009 6:56:17 PM
USER: System



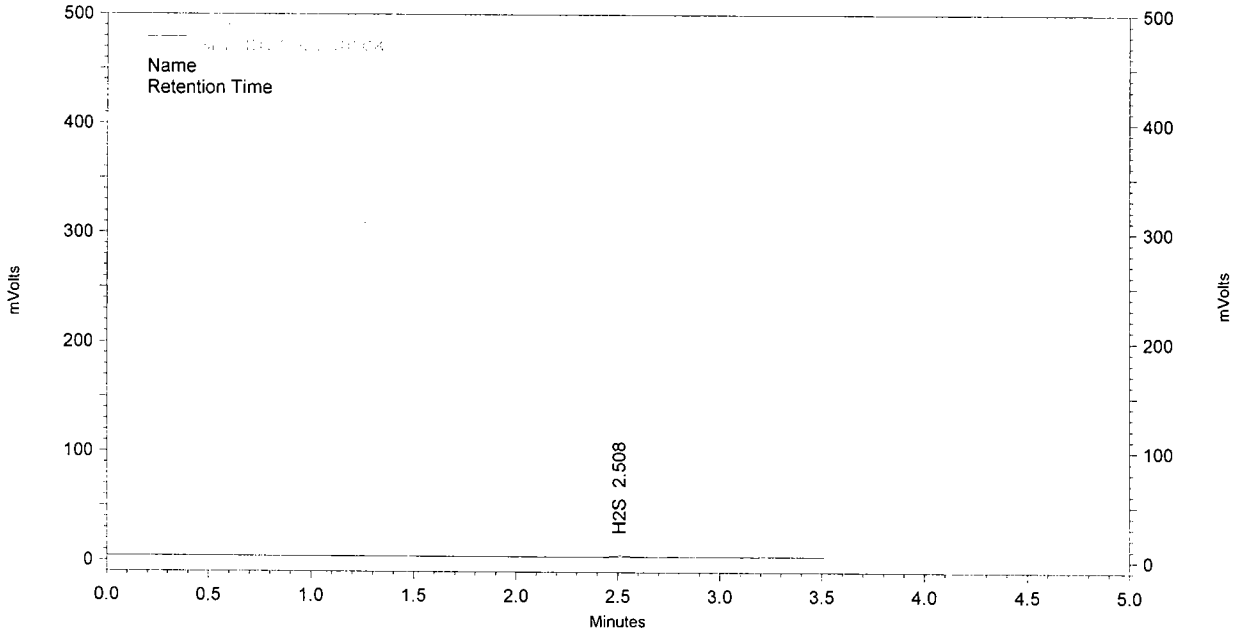
FPD Results

Name	Retention Time	Area
H2S	2.505	8270

Totals		8270

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: SP1 SET3 POST CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\POSTCHK3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 7:01:57 PM
PRINTED: 11/17/2009 7:06:22 PM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.508	8241

Totals		8241

B-100

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC #6 FPD Analysis - Initial Calibration: November 18, 2009

H_2S Standards Post Check-1 Result - November 18, 2009

(FPD@Range 2)

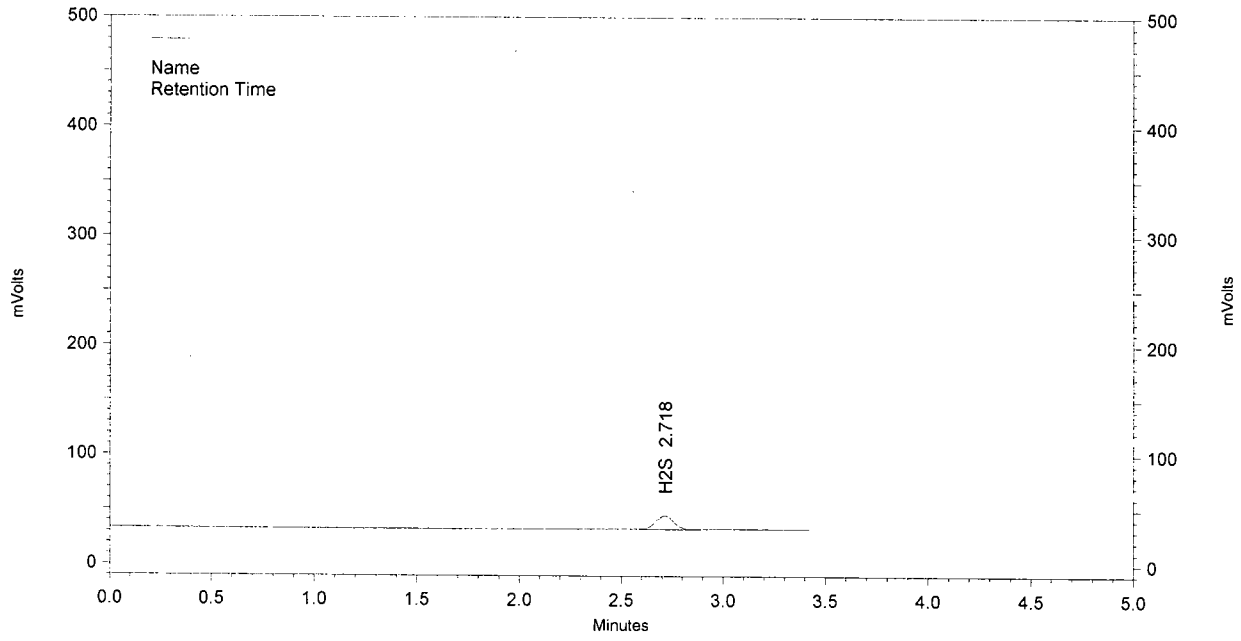
		Area Counts	Concentration
Sample ID No.	GC Run No.	H2S	H2S
		area counts (sq. root)	1.46
Initial Cal. Standard Avg.		274.5	ppmv
Calibration Post-Check Run	1	276.7	1.47
	2	275.9	1.47
	3	276.1	1.47
		Average =	1.5
		Standard Response Factor =	188.01
		QA Response Factor =	189.19
		Mean Response Factor =	188.60
		Percent Difference, % =	0.62
		Pass/Fail Criterion (<5%) =	Pass

Operator Stg Date 11-18-09

B101

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: STD CHK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\STDCHK1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 2:45:09 PM
PRINTED: 11/18/2009 2:49:22 PM
USER: System



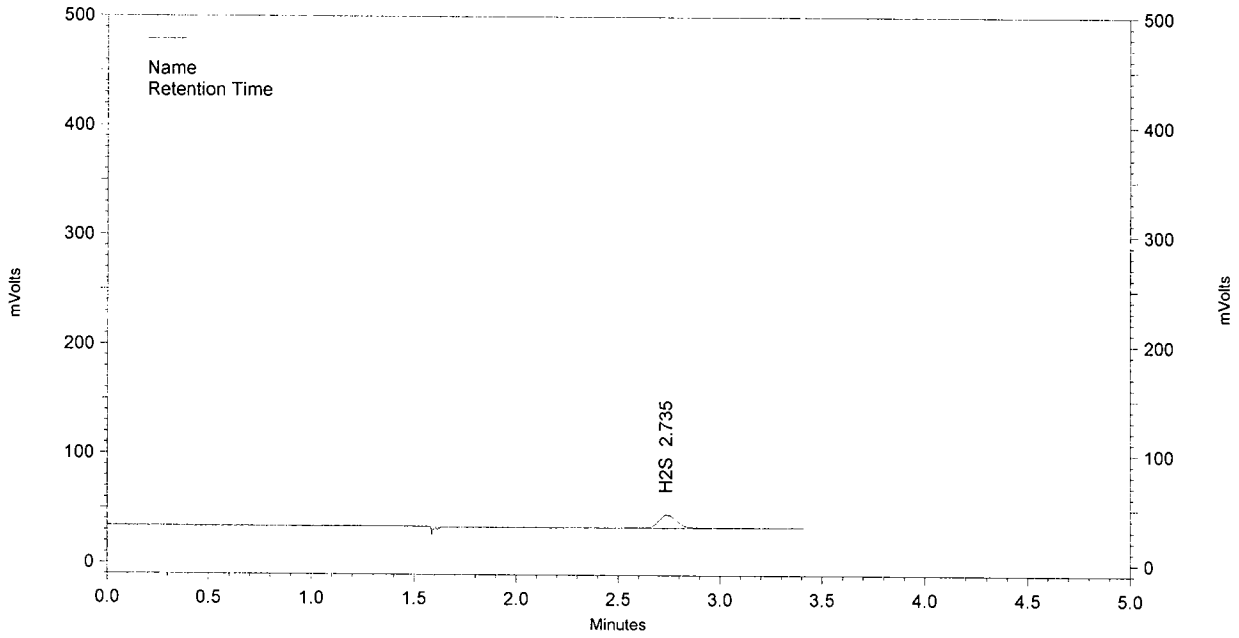
FPD Results

Name	Retention Time	Area
H2S	2.718	76572
Totals		76572

B102

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: STD CHK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\STDCHK2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 2:33:48 PM
PRINTED: 11/18/2009 2:39:36 PM
USER: System

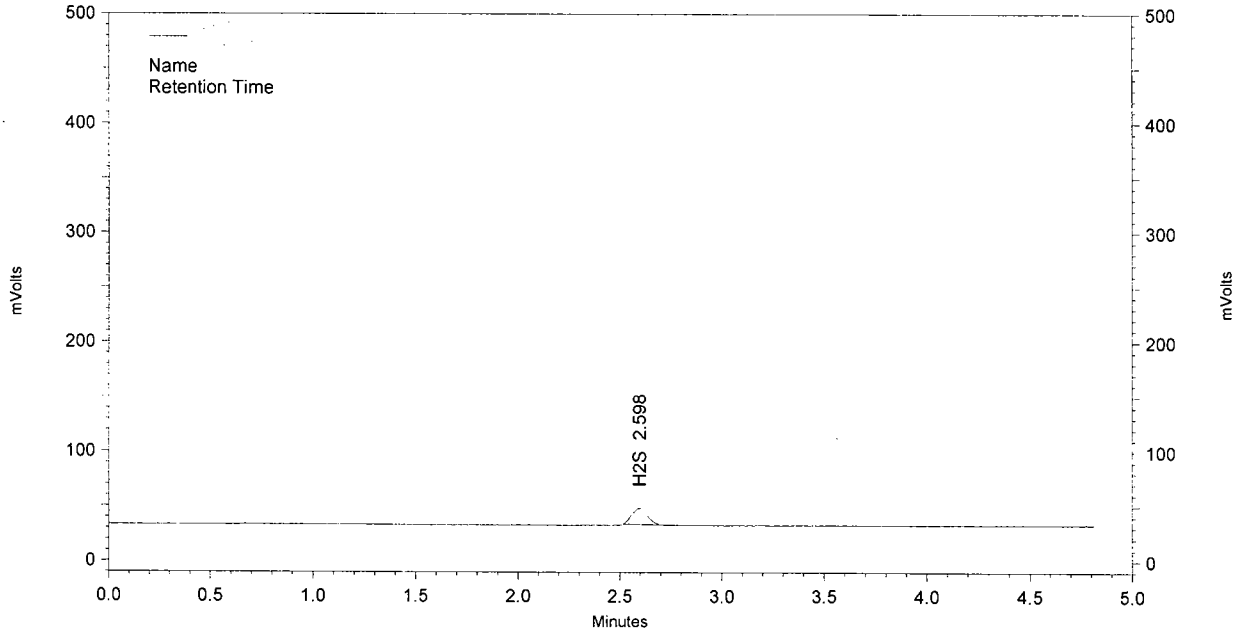


FPD Results

Name	Retention Time	Area
H2S	2.735	76217
Totals		76217

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: STD CHK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\STDCHK3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 2:39:54 PM
PRINTED: 11/18/2009 2:44:43 PM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.598	76096

Totals		76096

B104

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC #6 FPD Analysis - Initial Calibration: November 18, 2009

H_2S Standards Post Check-2 Result - November 18, 2009

(FPD@Range 2)

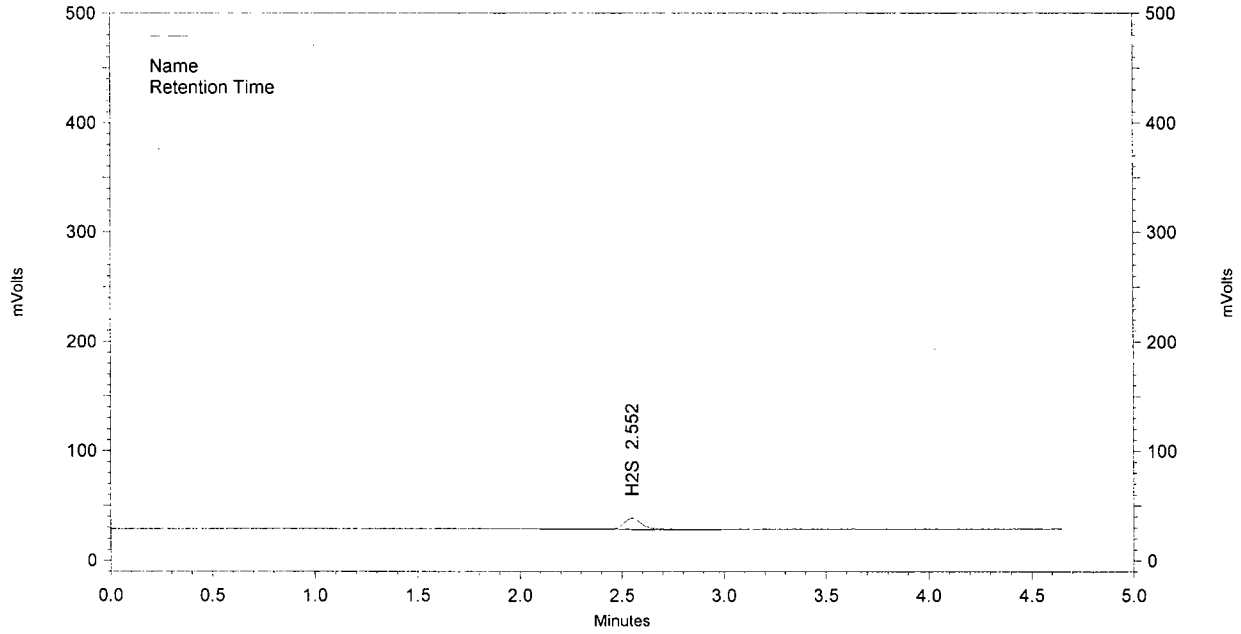
		Area Counts	Concentration
Sample ID No.	GC Run No.	H2S	H2S
		area counts (sq. root)	1.46
Initial Cal. Standard Avg.		274.5	ppmv
Calibration Post-Check Run	1	275.2	1.47
	2	274.7	1.46
	3	274.6	1.46
		Average =	1.46
		Standard Response Factor =	188.01
		QA Response Factor =	188.23
		Mean Response Factor =	188.12
		Percent Difference, % =	0.12
		Pass/Fail Criterion (<5%) =	Pass

Operator _____ Date 12-18-09

B105

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: STD POST CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\STDPOSTCHK1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 6:41:52 PM
PRINTED: 11/18/2009 6:46:31 PM
USER: System



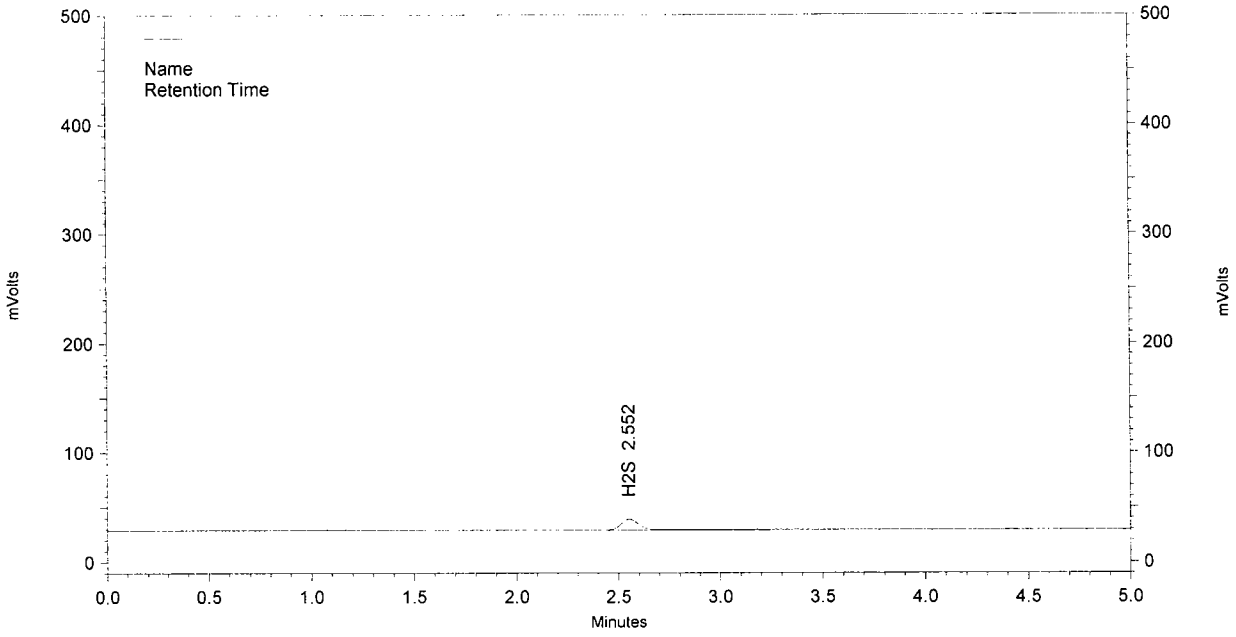
FPD Results

Name	Retention Time	Area
H2S	2.552	75717

Totals		75717

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: STD POST CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\STDPOSTCHK2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 6:47:05 PM
PRINTED: 11/18/2009 6:52:38 PM
USER: System



FPD Results

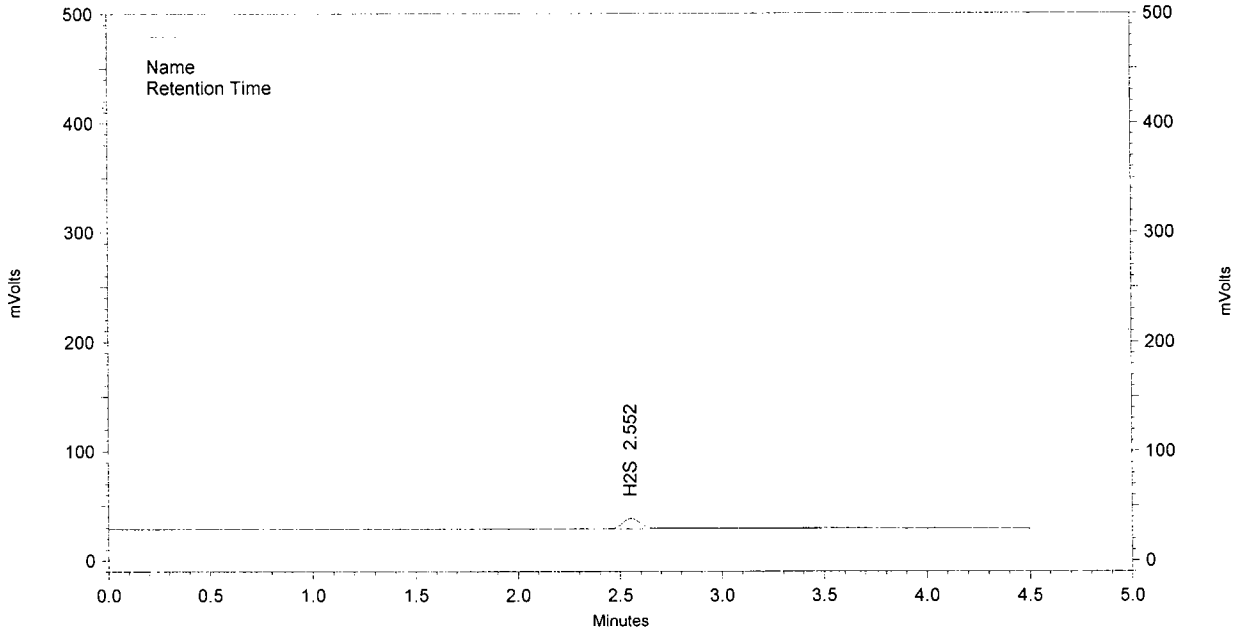
Name	Retention Time	Area
H2S	2.552	75433

Totals		75433

B107

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: STD POST CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\STDPOSTCHK3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 6:36:36 PM
PRINTED: 11/18/2009 6:56:30 PM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.552	75429

Totals		75429

B 108

Sulfur Analysis - GC / FPD

Sample Line Loss Check

(EPA method 15)

B109

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sample Line Loss Check (EPA Method 15) - November 17, 2009

Initial Calibration Date: Nov. 17, 2009 - GC#6 FPD (Range2), Chromosil-310 Column

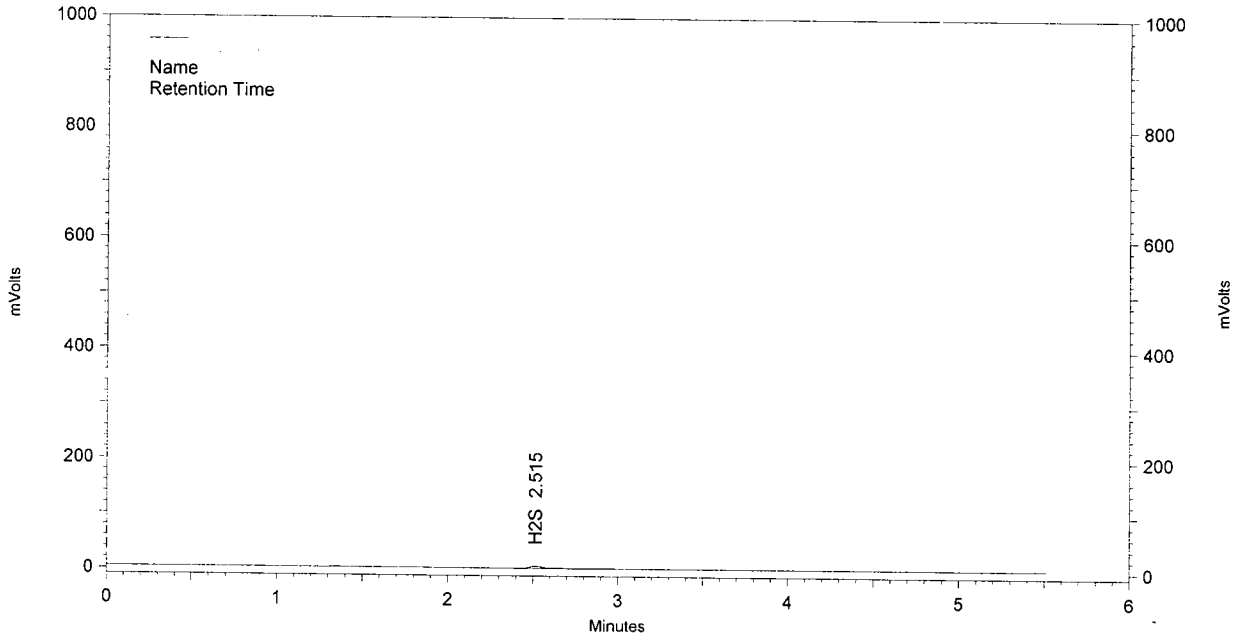
ID	X-Coefficient	Standard		Sample Line Feed		Sample Line Loss Recovery (%)	QC Limit (< 20%)
		Area	Conc. (ppmv)	Area	Conc. (ppmv)		
H_2S	9.50E-03	22909	1.44	21523	1.39	-3.07	Pass

Operator _____ Date 11-17-09

B110

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S CHK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\H2SCHK.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 2:26:33 PM
PRINTED: 11/17/2009 2:32:03 PM
USER: System



FPD Results

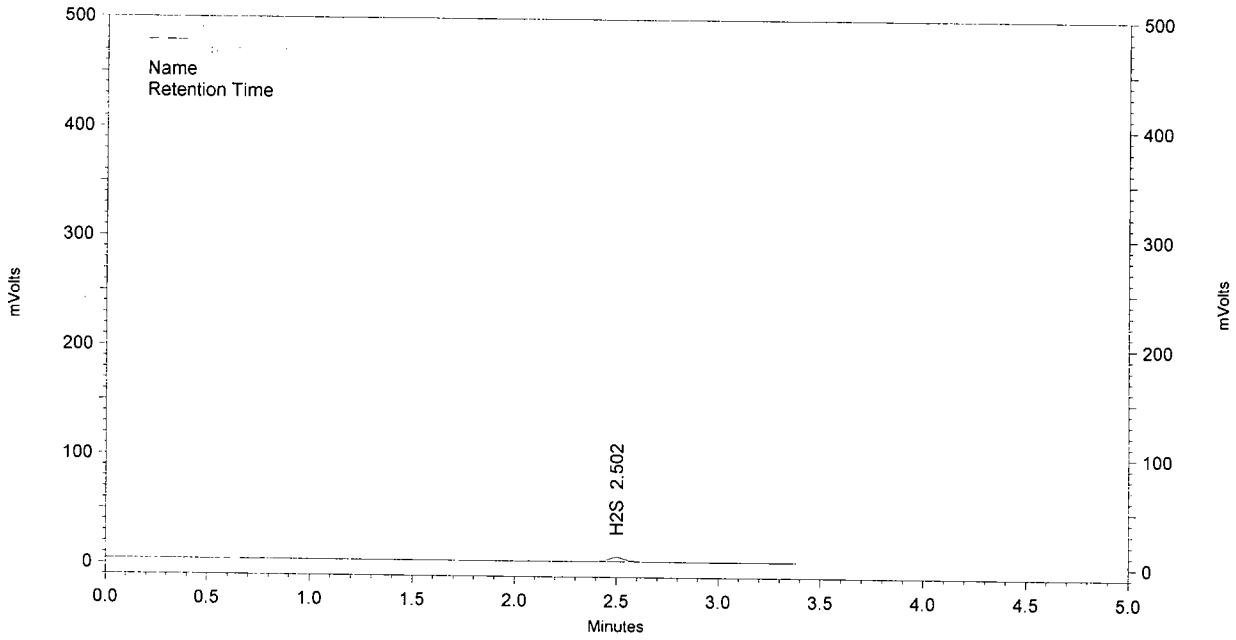
Name	Retention Time	Area
H2S	2.515	22909

Totals		
		22909

Bill

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: line loss check
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\linechk2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 7:47:06 PM
PRINTED: 11/17/2009 7:50:34 PM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.502	21523

Totals		
		21523

B112

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sample Line Loss Check (EPA Method 15) - November 18, 2009

Initial Calibration Date: Nov. 18, 2009 - GC#6 FPD (Range2), Chromosil-310 Column

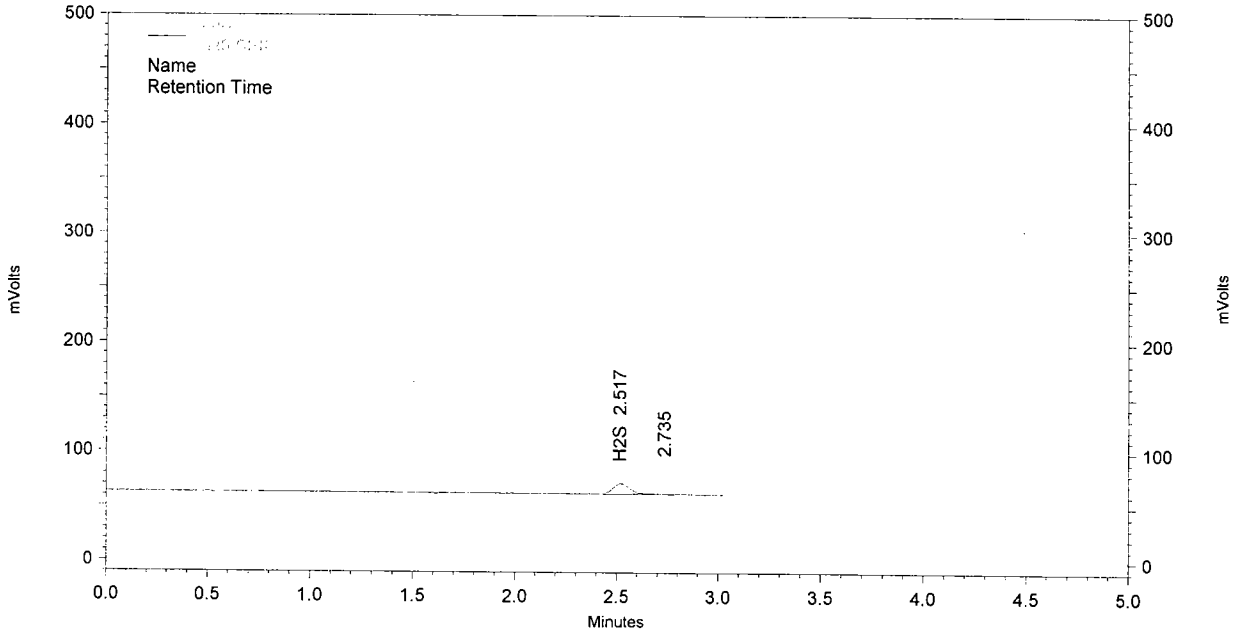
ID	X-Coefficient	Standard		Sample Line Feed		Sample Line Loss Recovery	QC Limit
		Area	Conc. (ppmv)	Area	Conc. (ppmv)	(%)	(< 20%)
H_2S	5.33E-03	58602	1.29	50560	1.20	-7.11	Pass

Operator _____ Date 11-18-09

B-113

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S CHK
FILE: E:\GC DATA\2009\Calibration\GC#6\111809ical\H2S CHK2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 10:39:15 AM
PRINTED: 11/18/2009 10:42:25 AM
USER: System



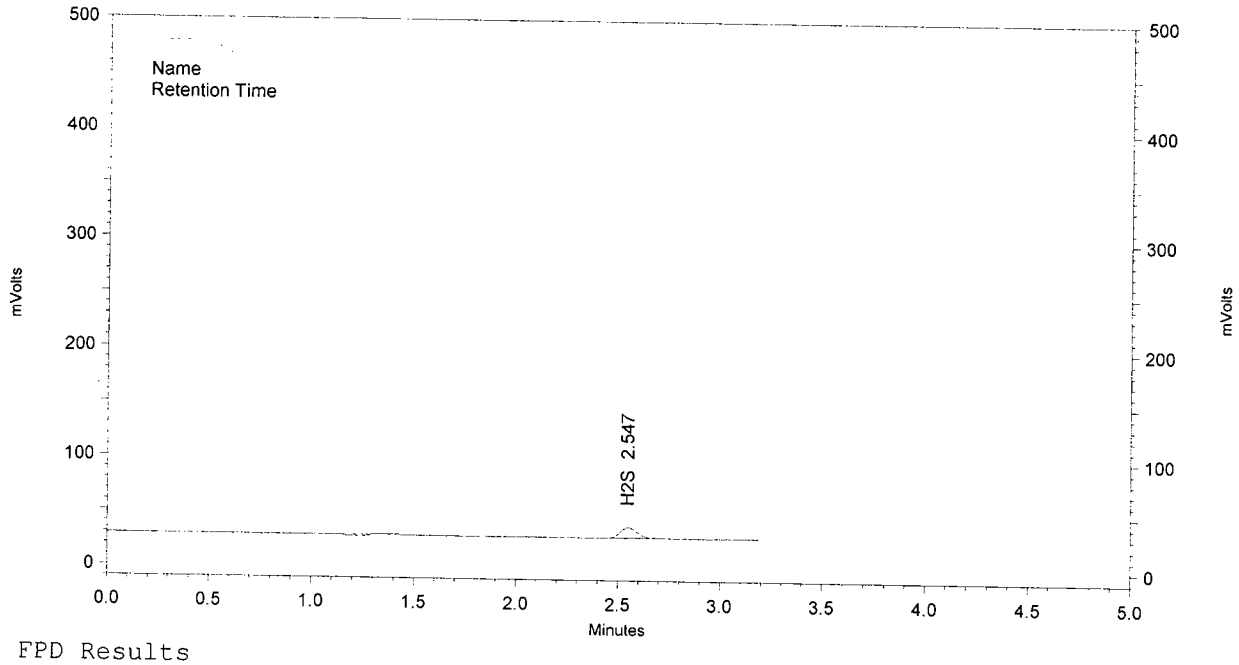
FPD Results

Name	Retention Time	Area
H2S	2.517	58602
	2.735	873
Totals		59475

B114

Entech Engineering Inc. League City, Texas

SAMPLE ID: LINE LOSS CHECK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\LINE_LOSS_CHK.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/18/2009 6:57:16 PM
PRINTED: 11/18/2009 7:00:27 PM
USER: System



FPD Results

Name	Retention Time	Area
H2S	2.547	50560
Totals		50560

B115

Sulfur Analysis - GC / FPD

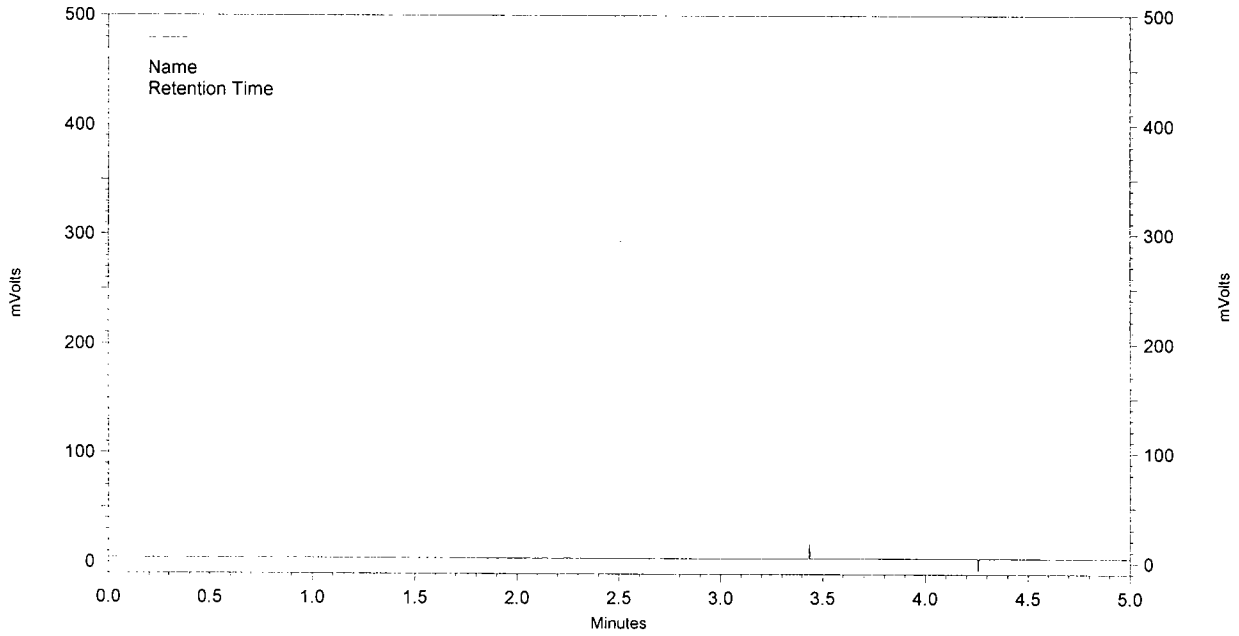
Test -1

Sample Results & Raw Data

(EPA method 15)

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: BLANK CHK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\BLANK.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_5 min.met
ACQUIRED: 11/17/2009 1:45:52 PM
PRINTED: 11/17/2009 1:51:47 PM
USER: System



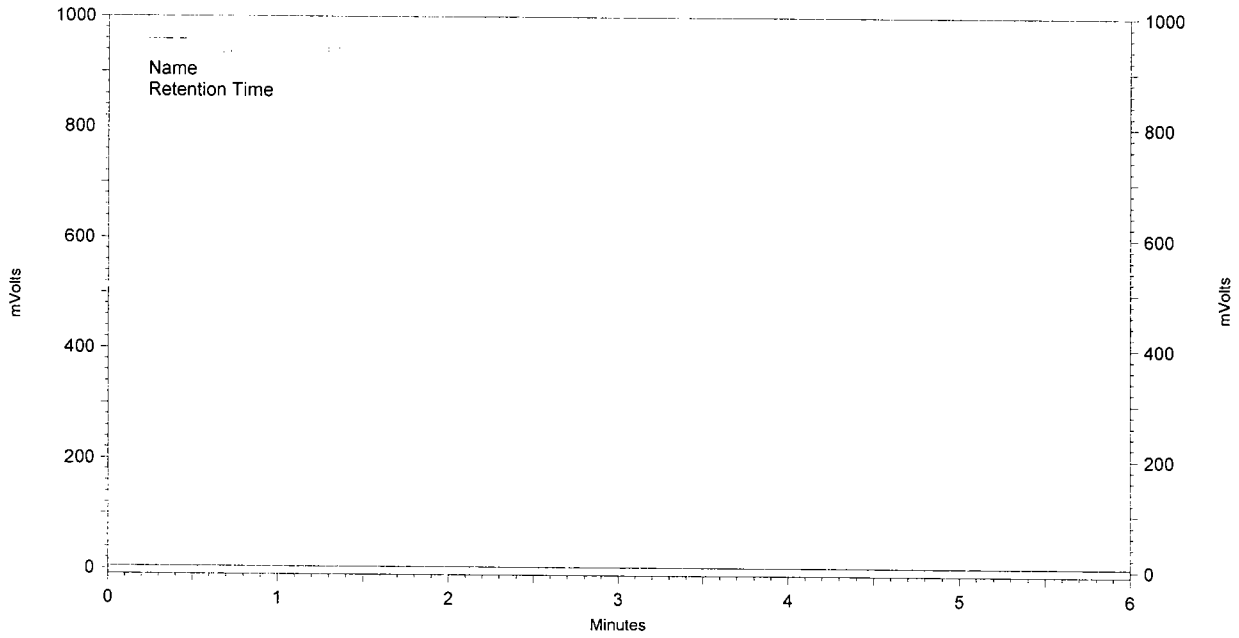
FPD Results

Name	Retention Time	Area

B 117

Entech Engineering Inc. League City, Texas

SAMPLE ID: 111709 TEST1 RUN1
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 3:08:33 PM
PRINTED: 11/17/2009 3:20:39 PM
USER: System



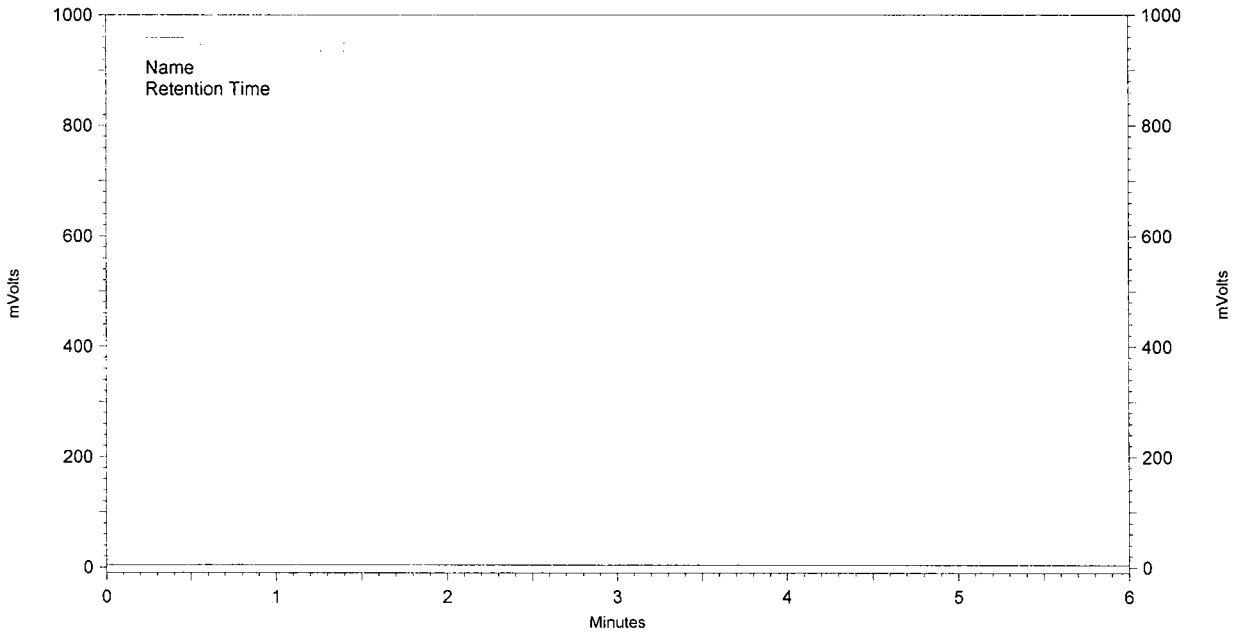
FPD Results

Name	Retention Time	Area

B118

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN2
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 3:20:55 PM
PRINTED: 11/17/2009 3:33:07 PM
USER: System



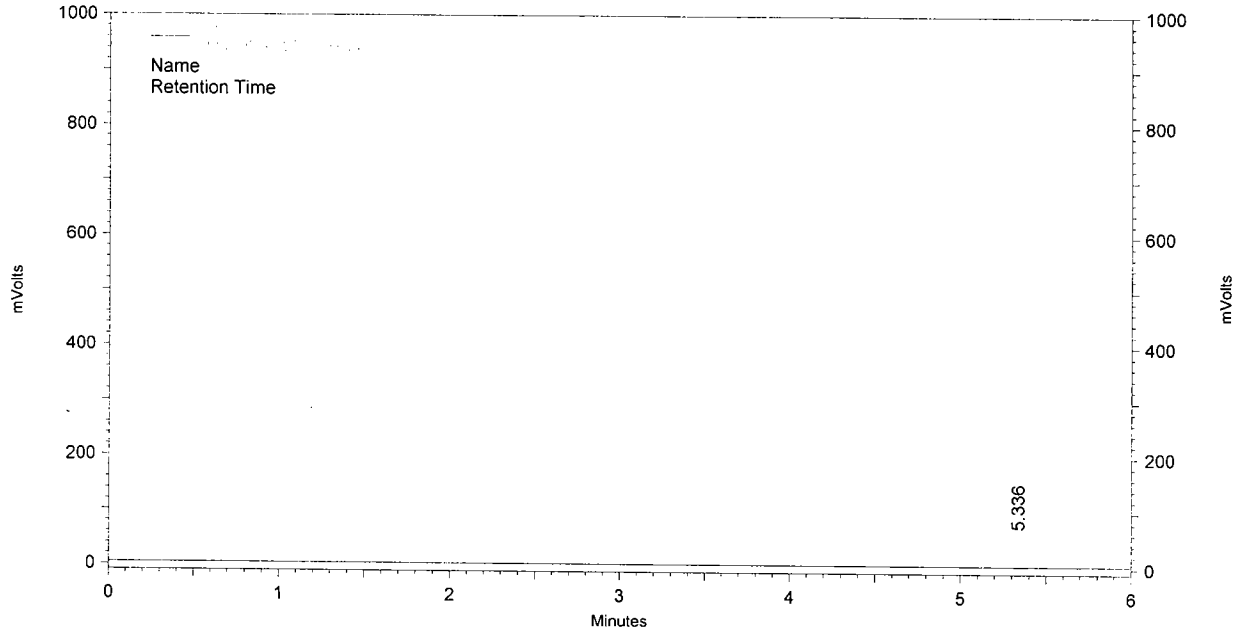
FPD Results

Name	Retention Time	Area

B119

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN3
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 3:35:27 PM
PRINTED: 11/17/2009 3:48:33 PM
USER: System



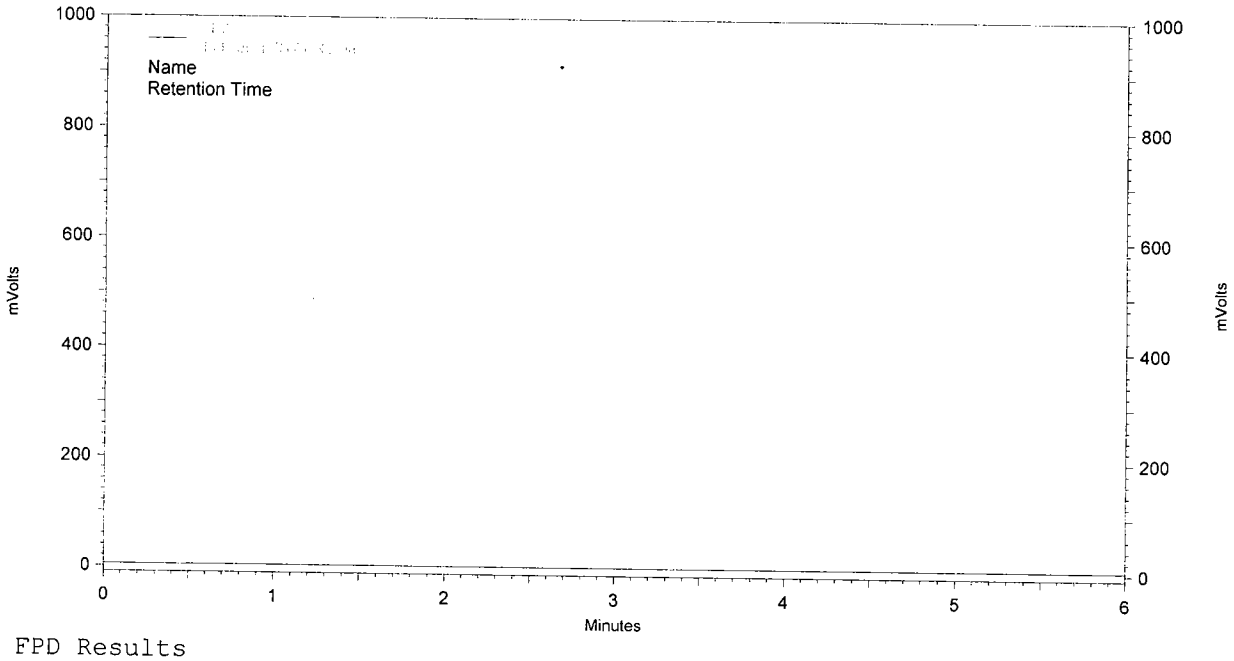
FPD Results

Name	Retention Time	Area
	5.336	837
	7.361	928
	11.901	1497
Totals		3262

B120

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN4
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R4.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 3:48:59 PM
PRINTED: 11/17/2009 4:01:05 PM
USER: System



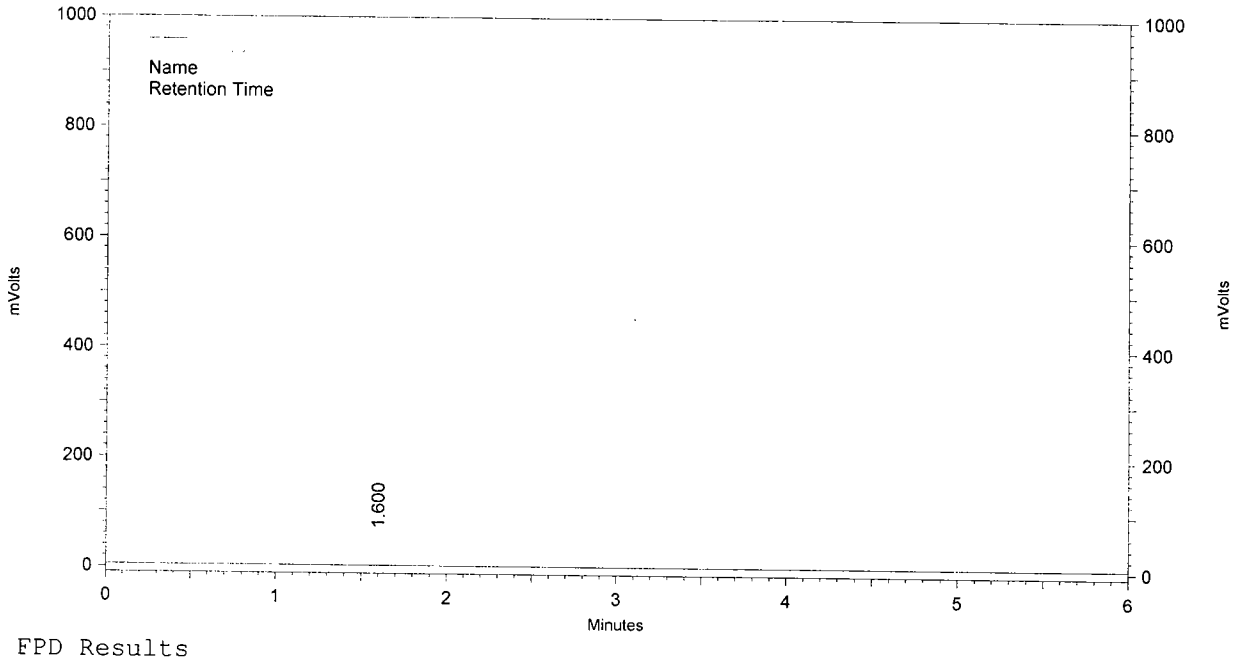
FPD Results

Name	Retention Time	Area
	6.326	890
Totals		890

B 121

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN5
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R5.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 4:01:36 PM
PRINTED: 11/17/2009 4:13:41 PM
USER: System



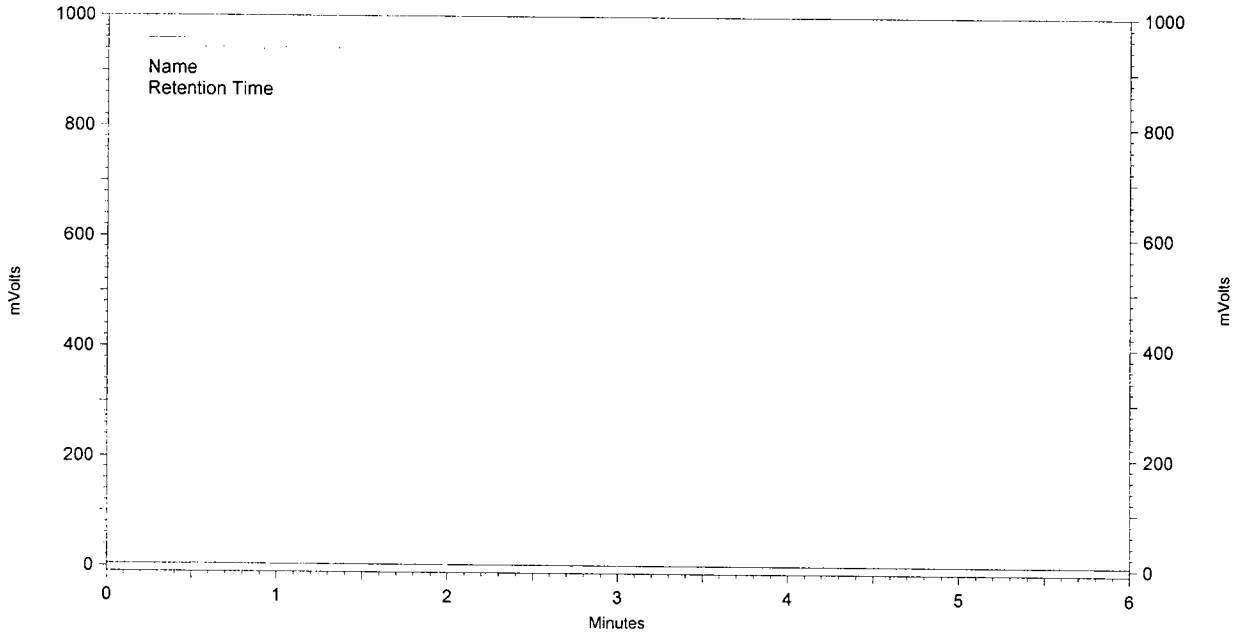
FPD Results

Name	Retention Time	Area
	1.600	809
	9.141	1801
	9.301	978
Totals		3588

B122

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN6
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R6.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 4:14:07 PM
PRINTED: 11/17/2009 4:26:13 PM
USER: System



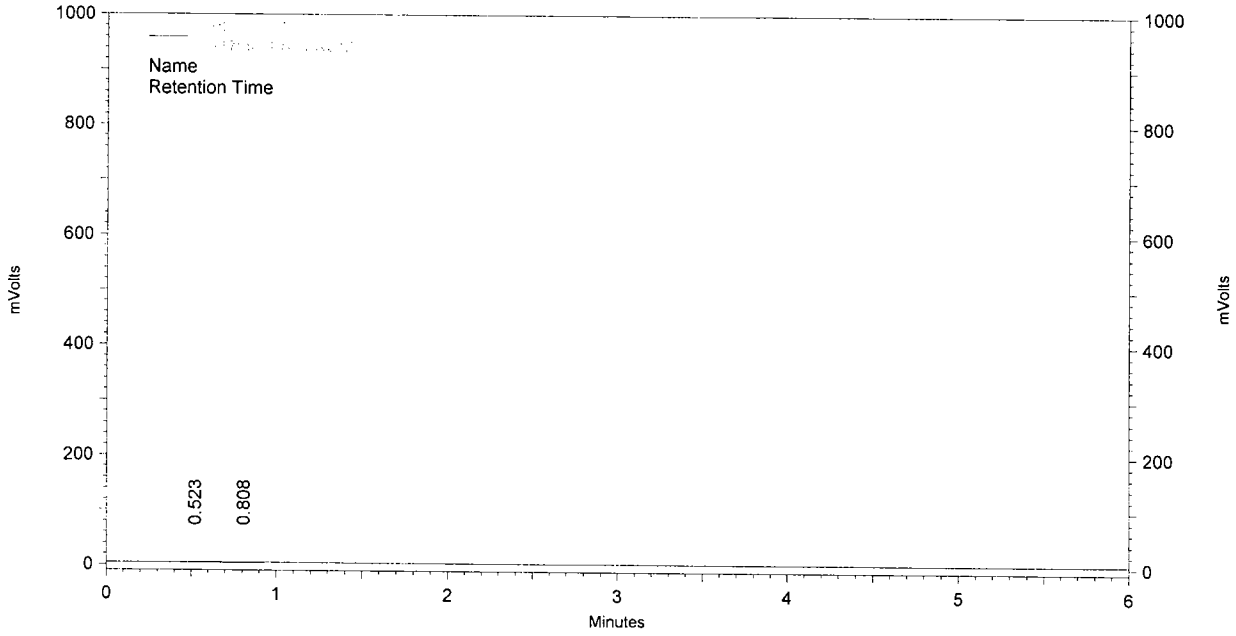
FPD Results

Name	Retention Time	Area
	10.323	1933
	10.468	1620
	10.838	2339
	11.118	1158
Totals		7050

B123

Entech Engineering Inc. League City, Texas

SAMPLE ID: 111709 TEST1 RUN7
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R7.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 4:26:43 PM
PRINTED: 11/17/2009 4:38:54 PM
USER: System



FPD Results

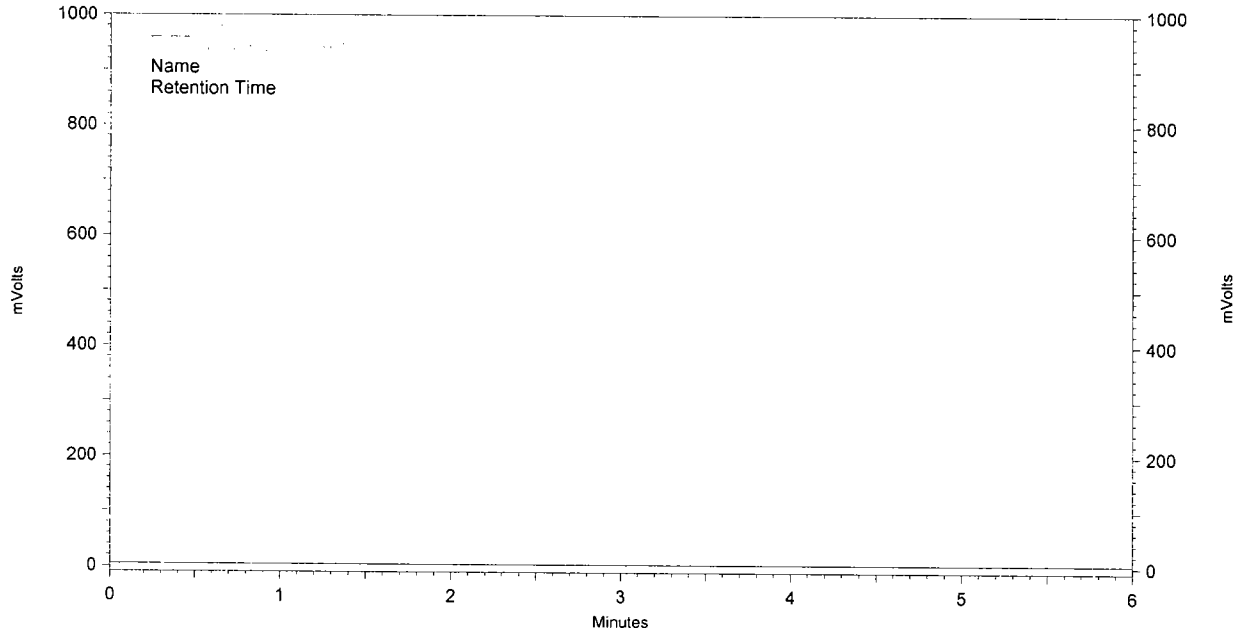
Name	Retention Time	Area
	0.523	1386
	0.808	1002
	9.793	914
	10.418	888
	11.311	830

Totals		
		5020

B124

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN8
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R8.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 4:39:17 PM
PRINTED: 11/17/2009 4:51:30 PM
USER: System



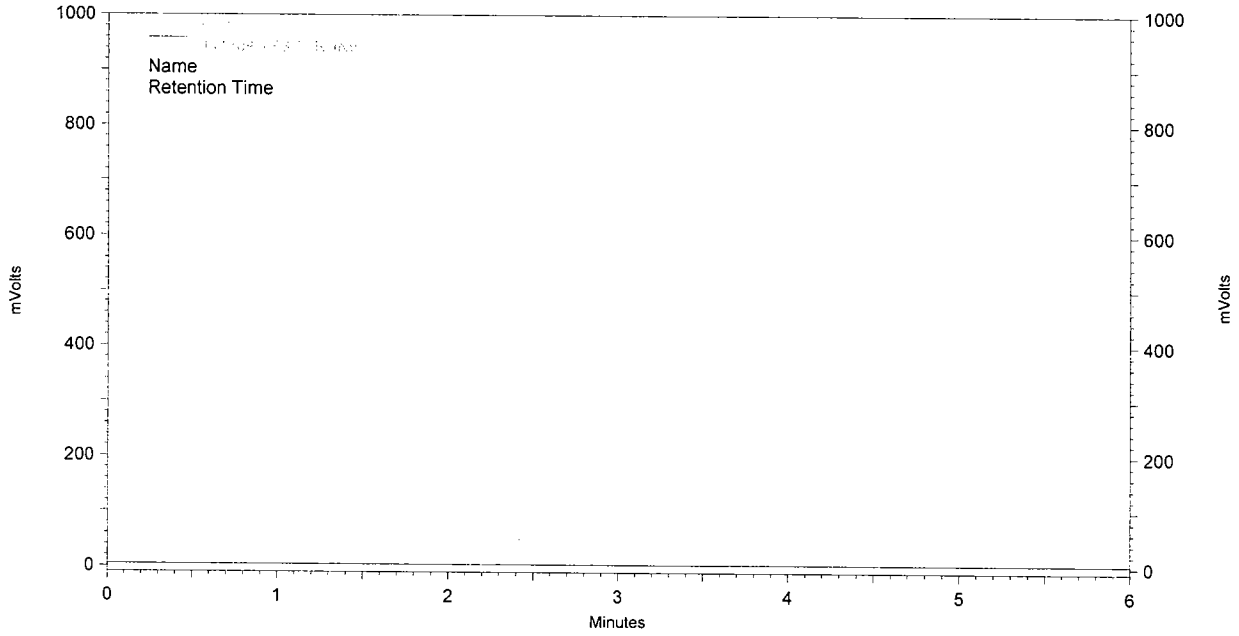
FPD Results

Name	Retention Time	Area
	8.453	1206
	9.633	1025
	10.044	841
	10.168	1157
	11.026	1595
Totals		5824

B125

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN9
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R9.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 4:51:55 PM
PRINTED: 11/17/2009 5:04:09 PM
USER: System



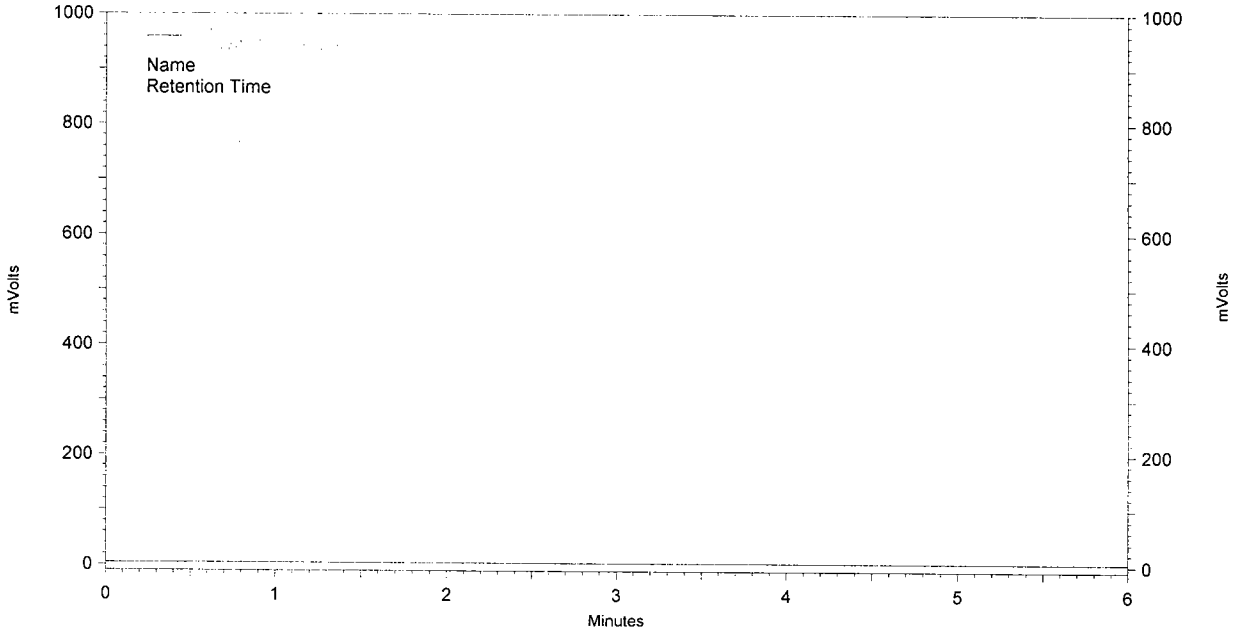
FPD Results

Name	Retention Time	Area
	11.119	887
Totals		887

B126

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN10
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R10.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 5:04:34 PM
PRINTED: 11/17/2009 5:16:39 PM
USER: System

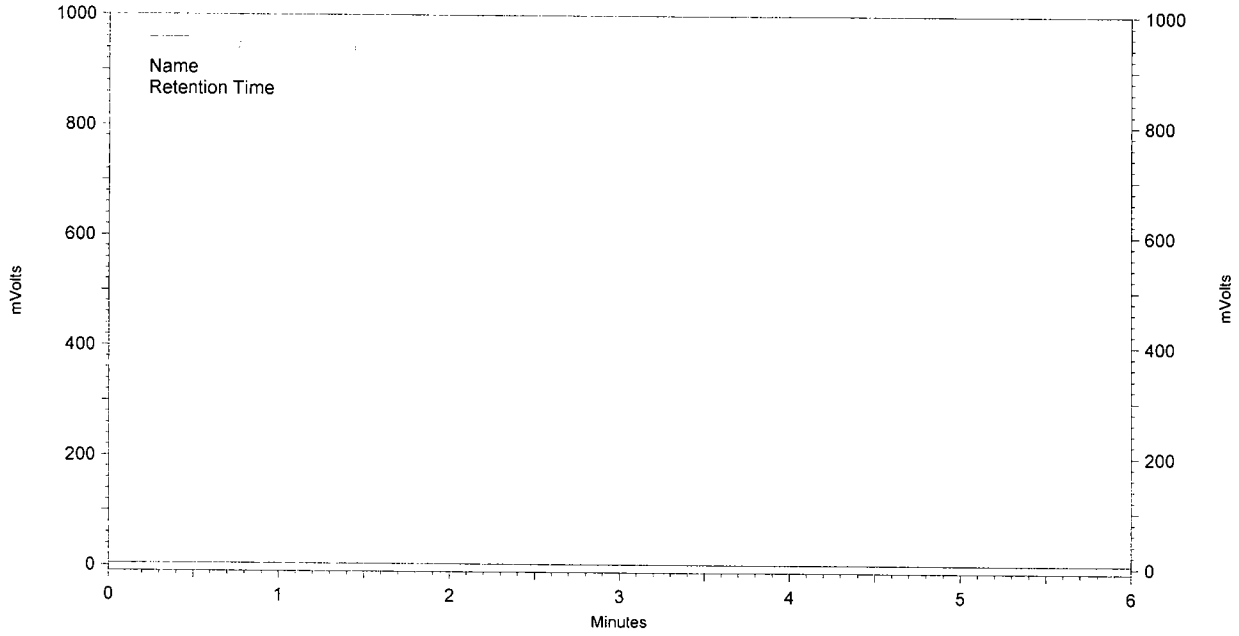


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN11
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R11.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 5:17:17 PM
PRINTED: 11/17/2009 5:29:24 PM
USER: System

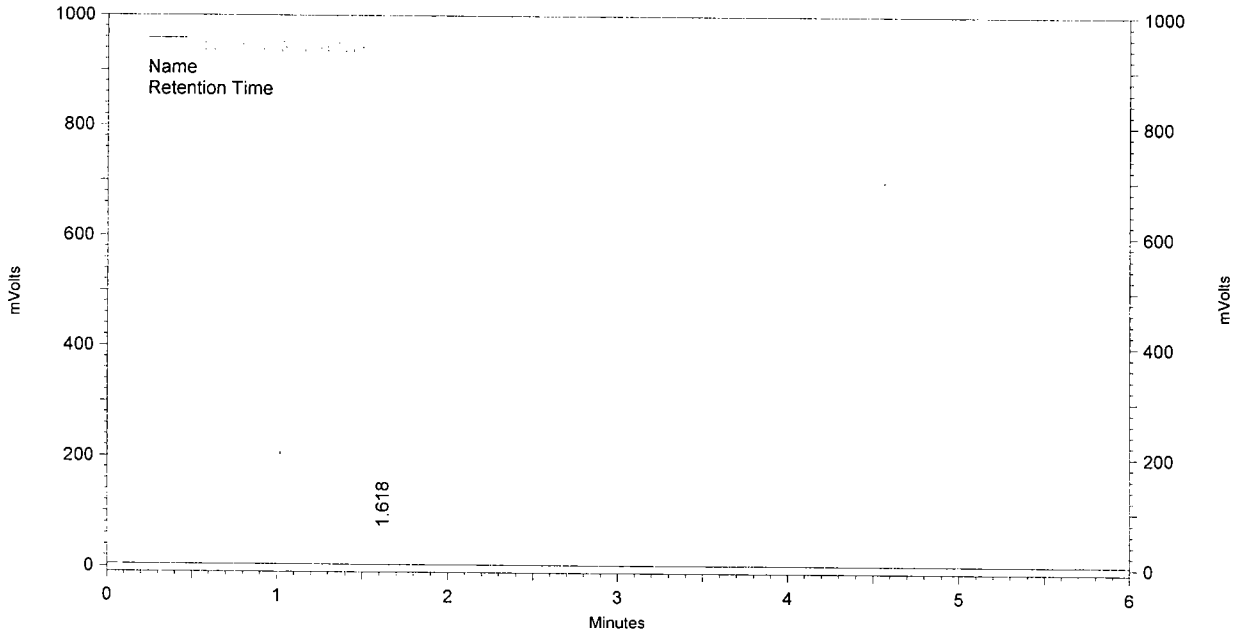


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN12
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R12.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 5:29:55 PM
PRINTED: 11/17/2009 5:42:00 PM
USER: System



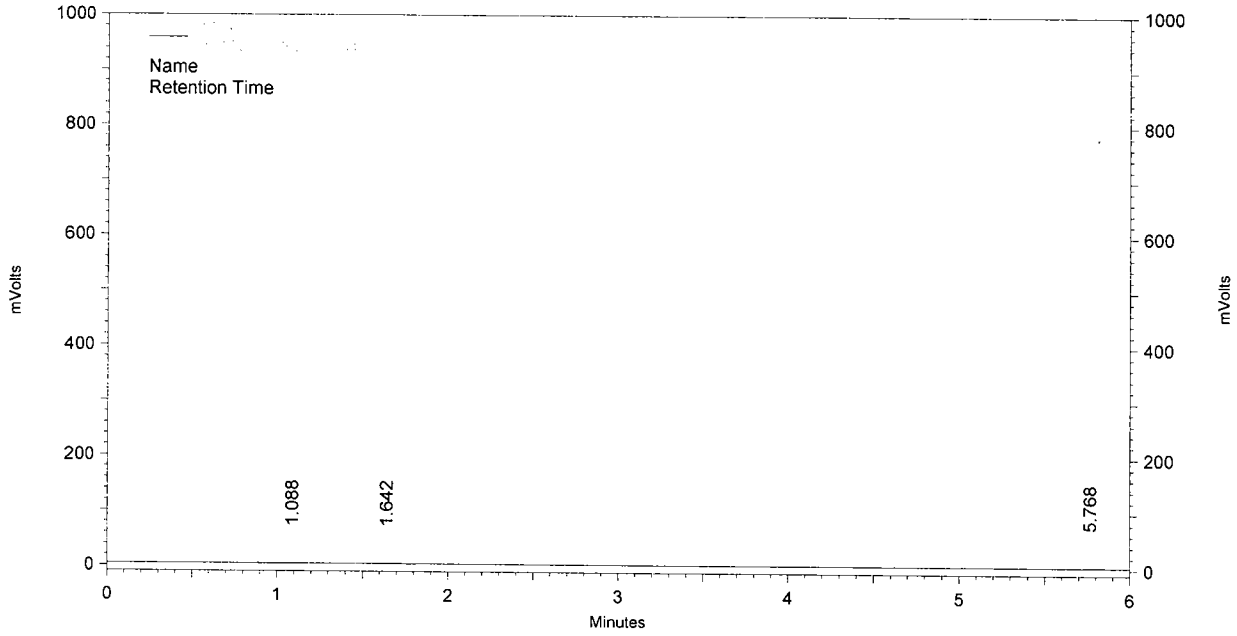
FPD Results

Name	Retention Time	Area
	1.618	814
Totals		814

B129

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN13
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R13.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 5:43:47 PM
PRINTED: 11/17/2009 5:55:53 PM
USER: System



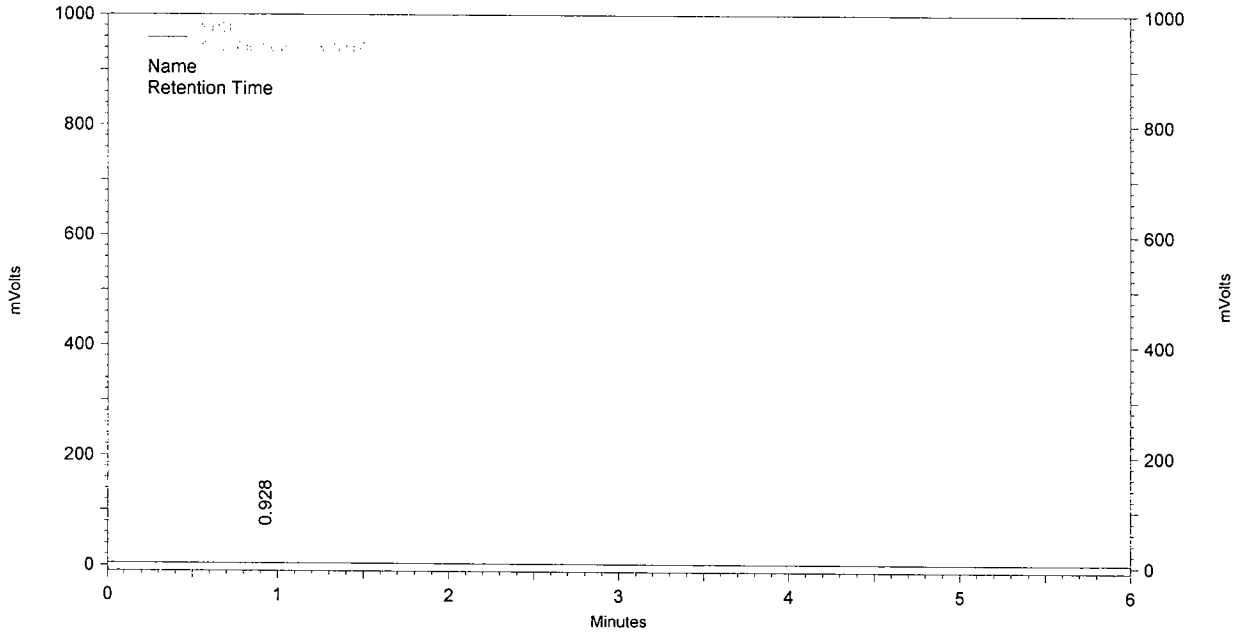
FPD Results

Name	Retention Time	Area
	1.088	816
	1.642	879
	5.768	859
	8.398	971
Totals		3525

B130

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN14
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R14.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 5:57:03 PM
PRINTED: 11/17/2009 6:09:07 PM
USER: System



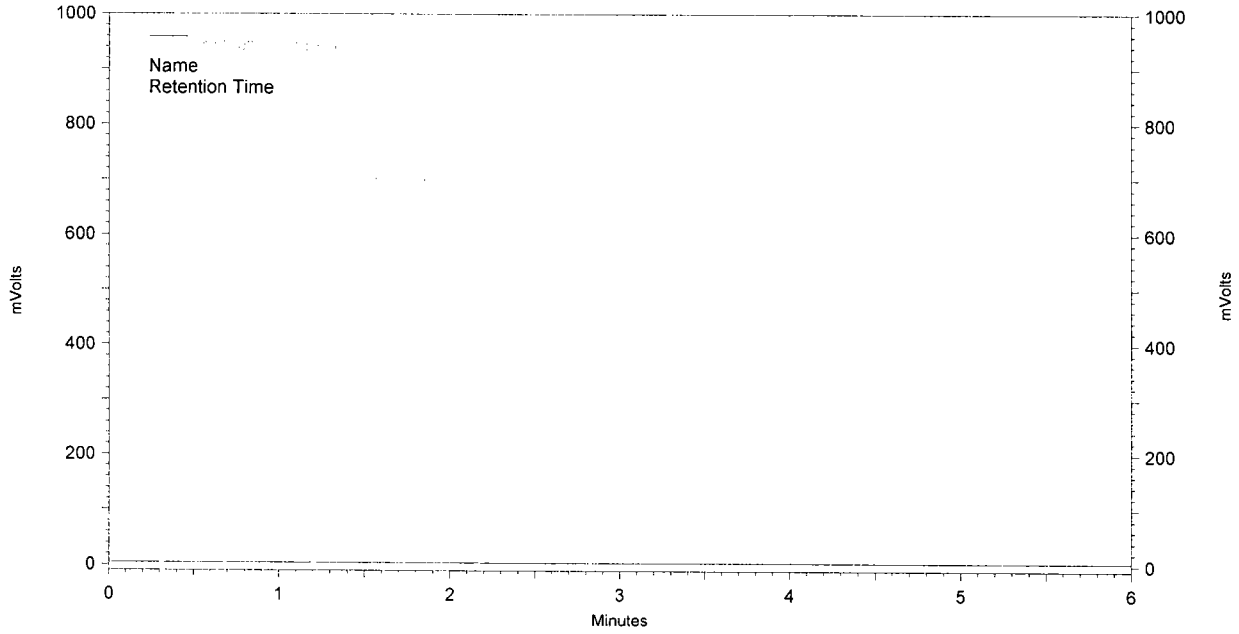
FPD Results

Name	Retention Time	Area
	0.928	833
	10.238	1265
	10.628	930
Totals		3028

B131

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN15
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R15.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 6:09:32 PM
PRINTED: 11/17/2009 6:21:55 PM
USER: System

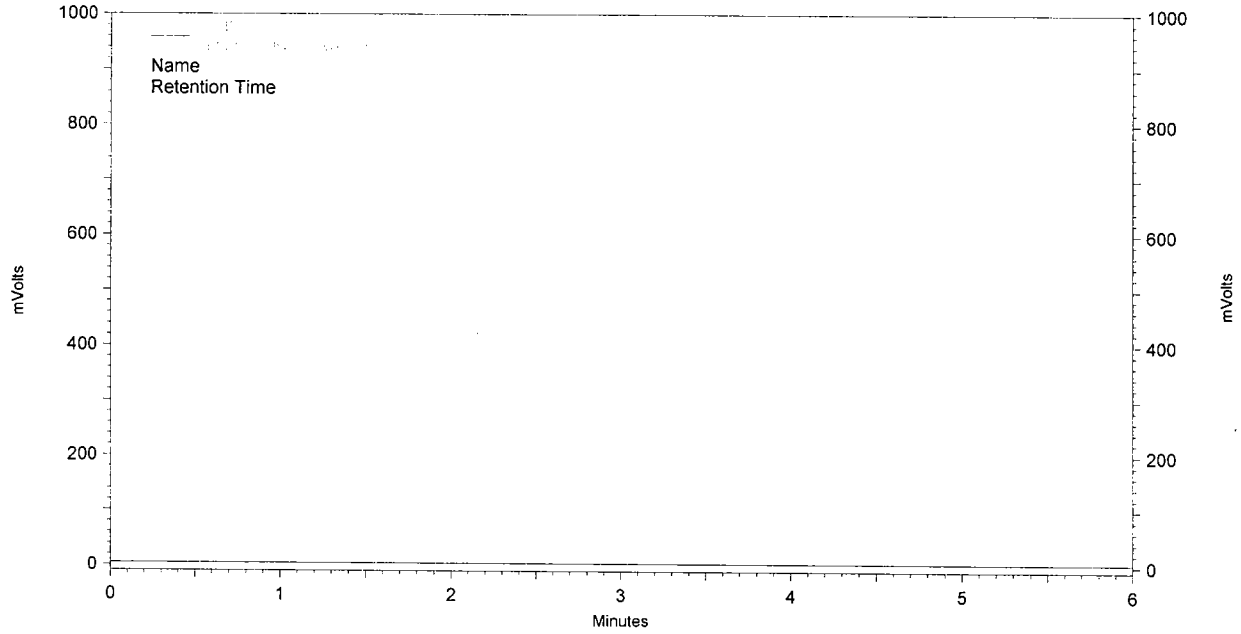


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN16
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R16.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 6:22:21 PM
PRINTED: 11/17/2009 6:33:57 PM
USER: System

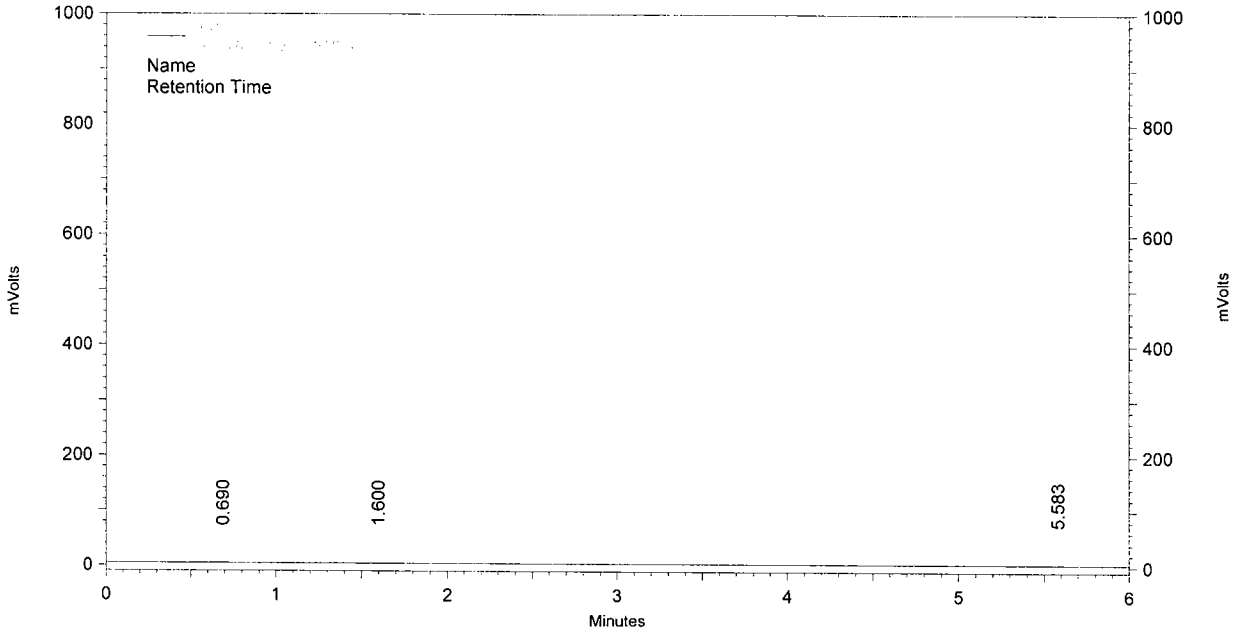


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: 111709 TEST1 RUN17
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111709\T1R17.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/17/2009 6:34:26 PM
PRINTED: 11/17/2009 6:44:22 PM
USER: System



FPD Results

Name	Retention Time	Area
	0.690	1590
	1.600	835
	5.583	839

Totals		3264

B134

Sulfur Analysis - GC / FPD

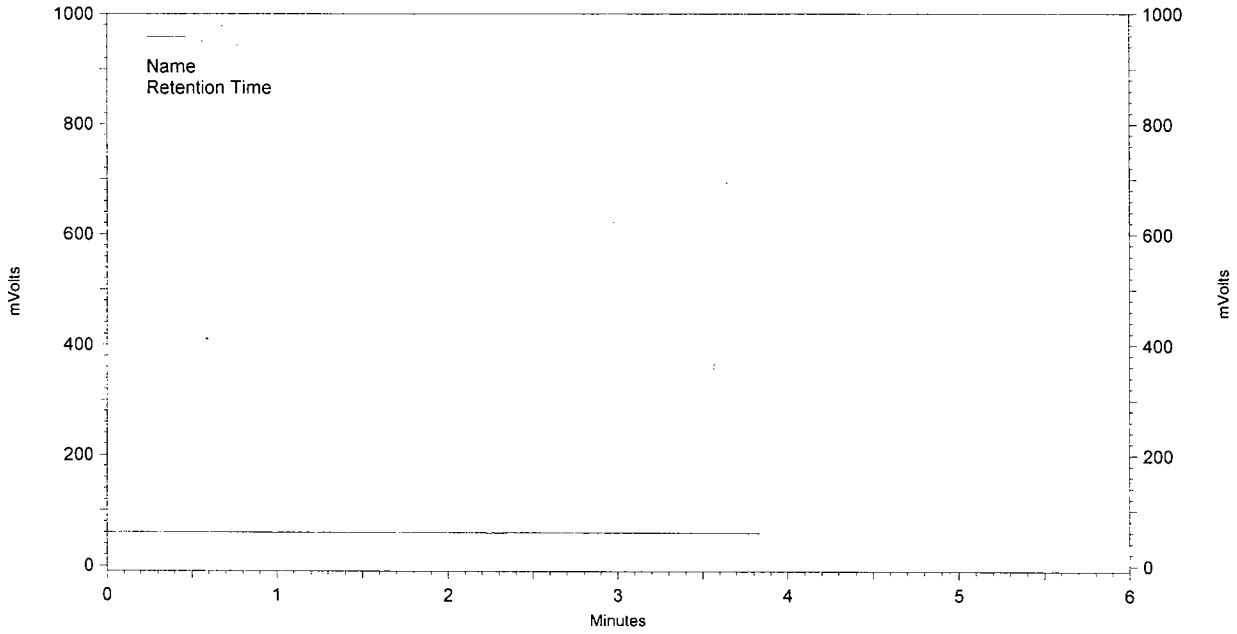
Test - 2

Sample Results & Raw Data

(EPA method 15)

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: BLANK
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\BLANK.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 10:45:39 AM
PRINTED: 11/18/2009 10:49:47 AM
USER: System

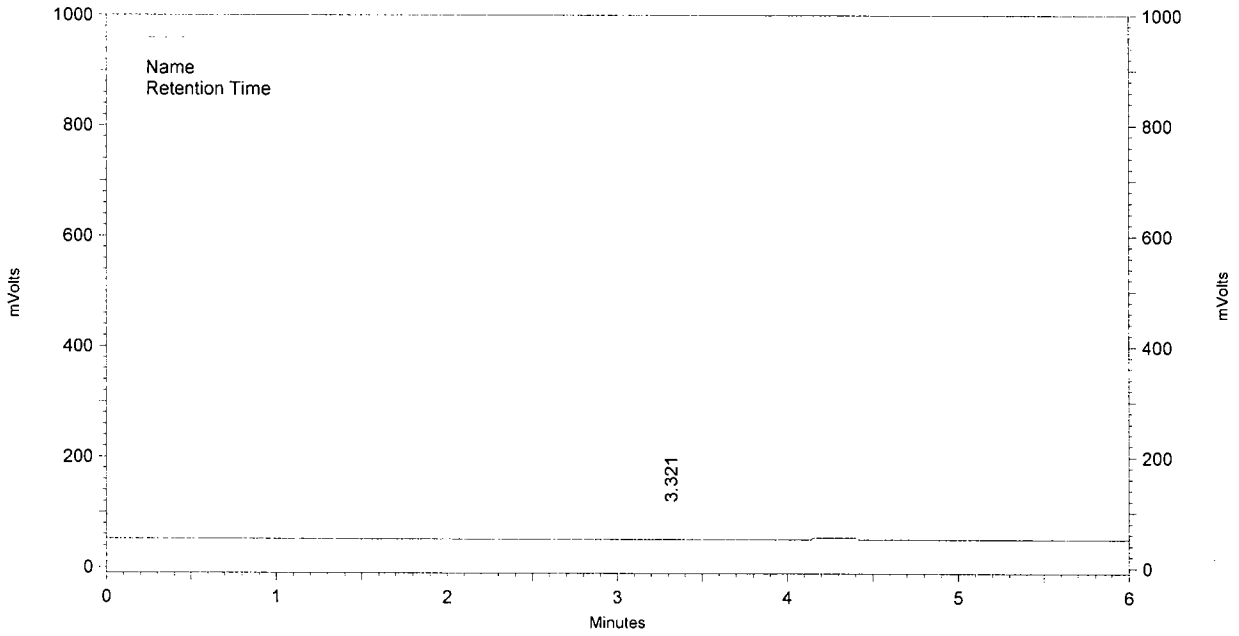


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN1
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 11:15:57 AM
PRINTED: 11/18/2009 11:25:16 AM
USER: System



FPD Results

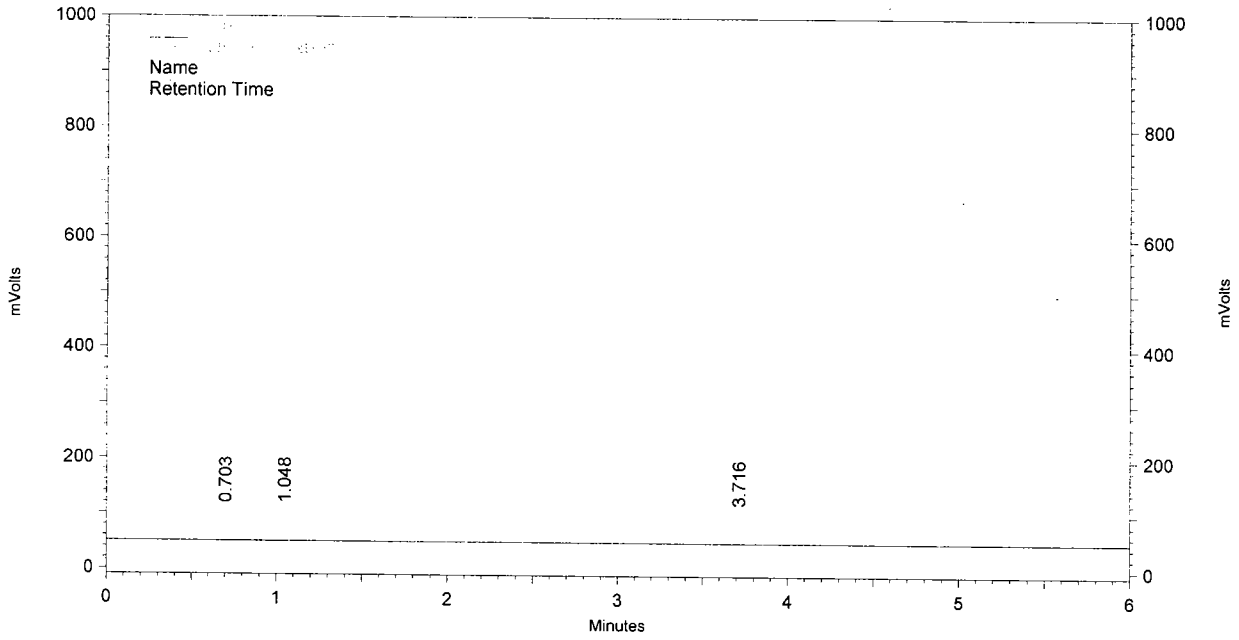
Name	Retention Time	Area
	3.321	6727

Totals		6727

B-137

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN2
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 11:28:19 AM
PRINTED: 11/18/2009 11:34:24 AM
USER: System



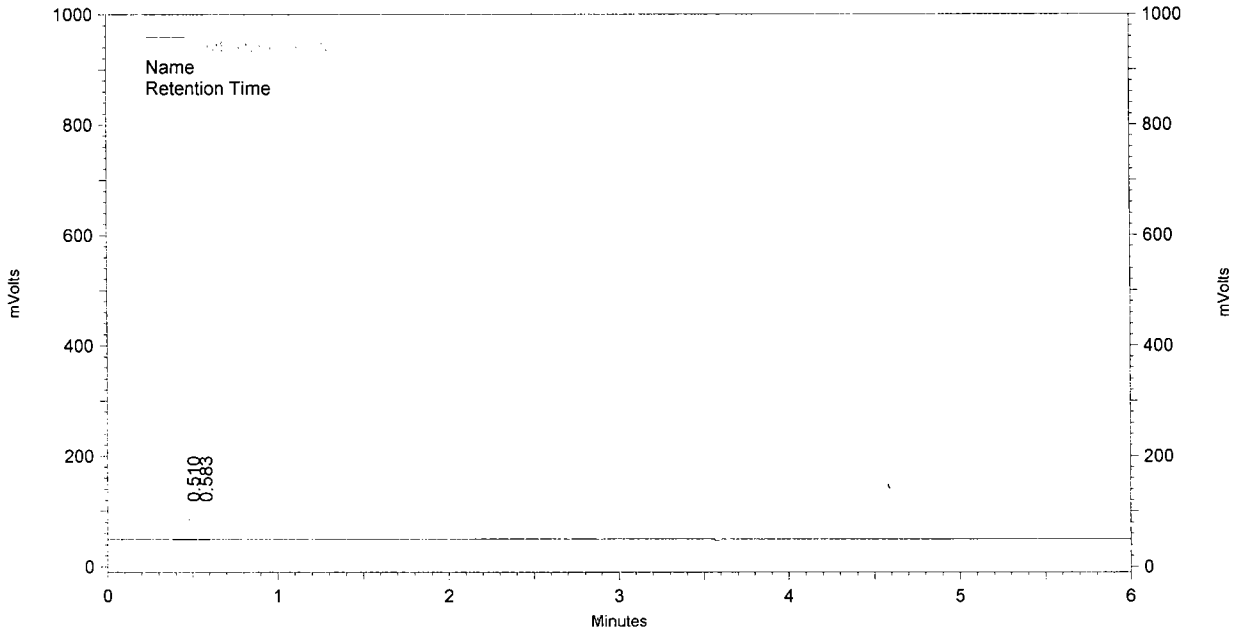
FPD Results

Name	Retention Time	Area
	0.703	3142
	1.048	3150
	3.716	5197
Totals		11489

B-138

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN3
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 11:40:22 AM
PRINTED: 11/18/2009 11:46:38 AM
USER: System



FPD Results

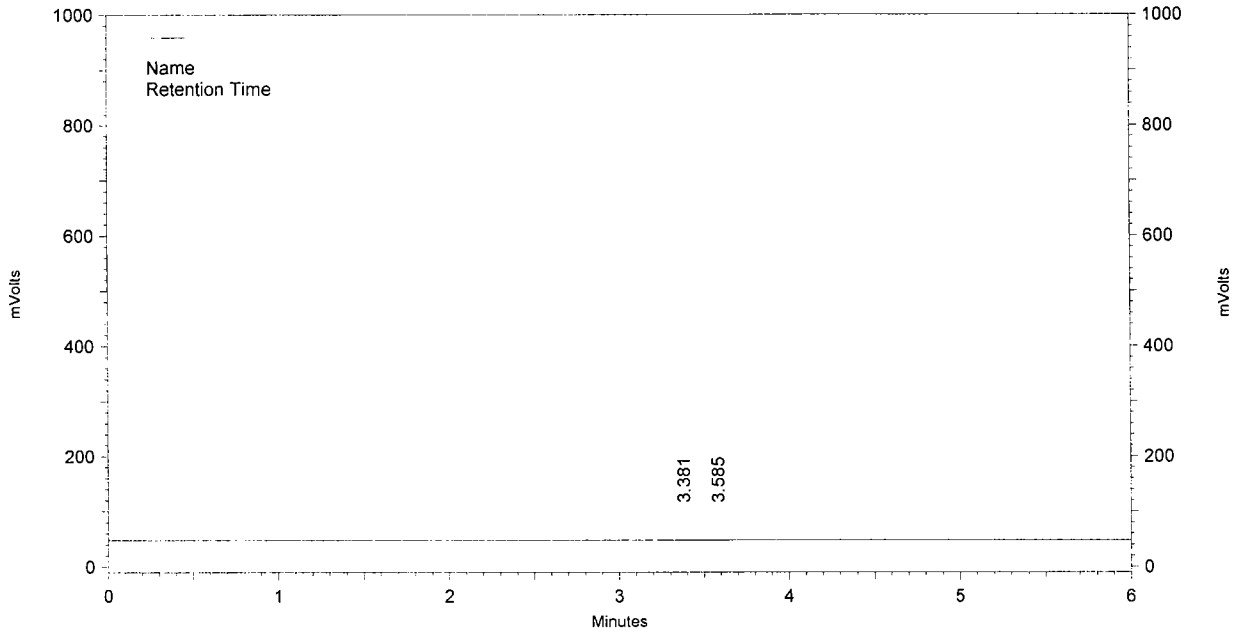
Name	Retention Time	Area
	0.510	3248
	0.583	2576

Totals		5824

B-139

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: H2S TEST2 RUN4
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN4.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 11:52:25 AM
PRINTED: 11/18/2009 12:07:31 PM
USER: System



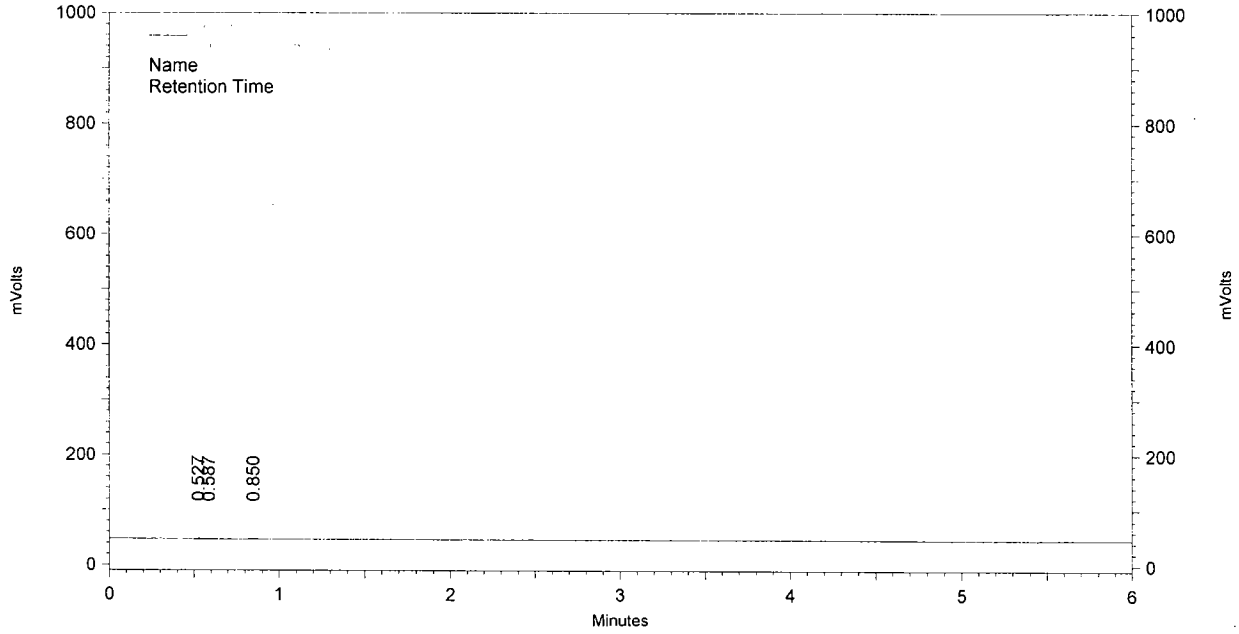
FPD Results

Name	Retention Time	Area
	3.381	4855
	3.585	3335
Totals		8190

B140

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN5
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN5.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 12:07:49 PM
PRINTED: 11/18/2009 12:14:30 PM
USER: System



FPD Results

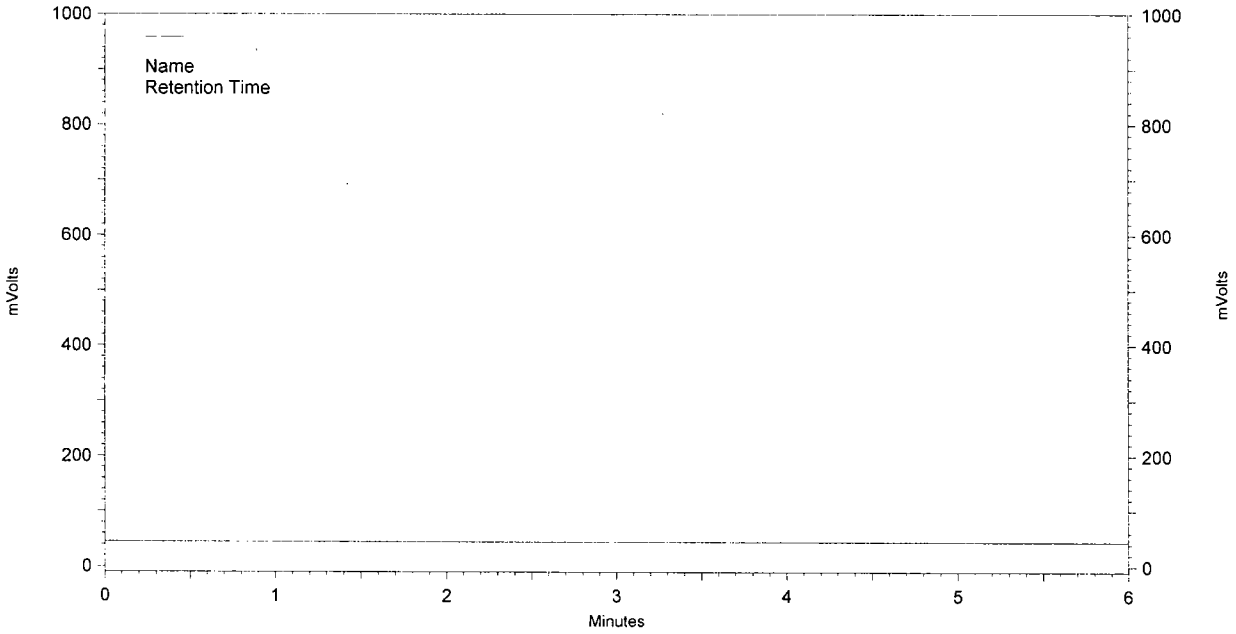
Name	Retention Time	Area
	0.527	2864
	0.587	4519
	0.850	5412

Totals		12795

B-141

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN6
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN6.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 12:20:24 PM
PRINTED: 11/18/2009 12:30:06 PM
USER: System

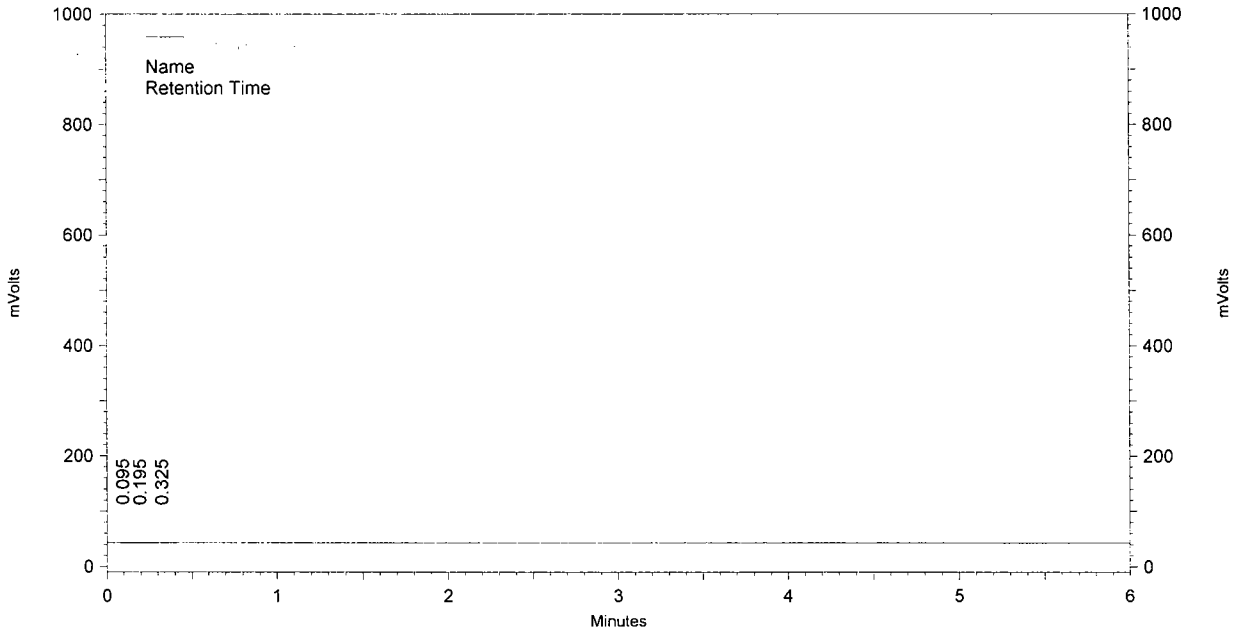


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN7
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN7.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 12:32:29 PM
PRINTED: 11/18/2009 12:39:28 PM
USER: System



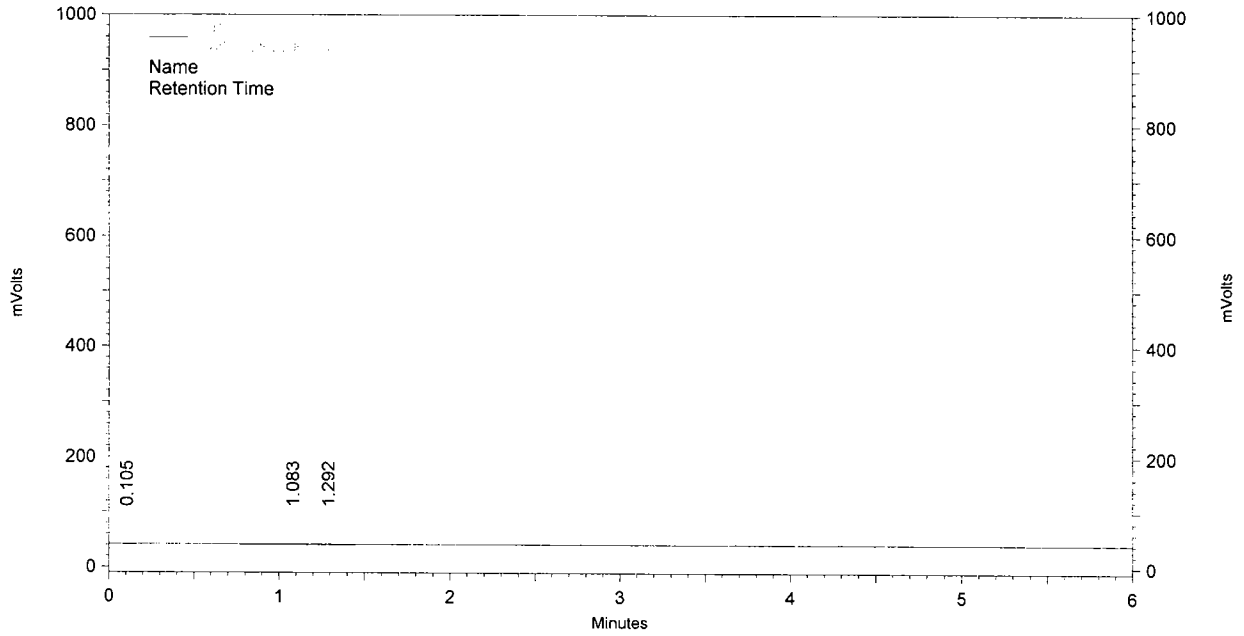
FPD Results

Name	Retention Time	Area
	0.095	4215
	0.195	4743
	0.325	4452

Totals		13410

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN8
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN8.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 12:44:07 PM
PRINTED: 11/18/2009 12:50:42 PM
USER: System



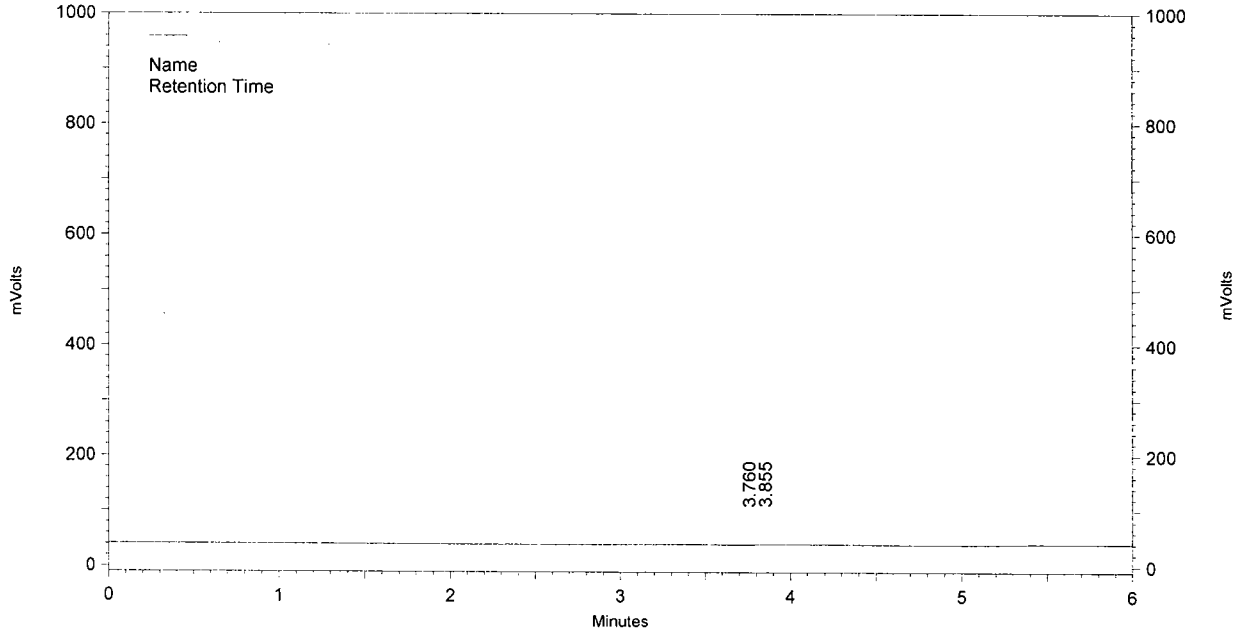
FPD Results

Name	Retention Time	Area
	0.105	2613
	1.083	6282
	1.292	4084
Totals		12979

B144

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN9
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN9.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 12:56:16 PM
PRINTED: 11/18/2009 1:04:06 PM
USER: System



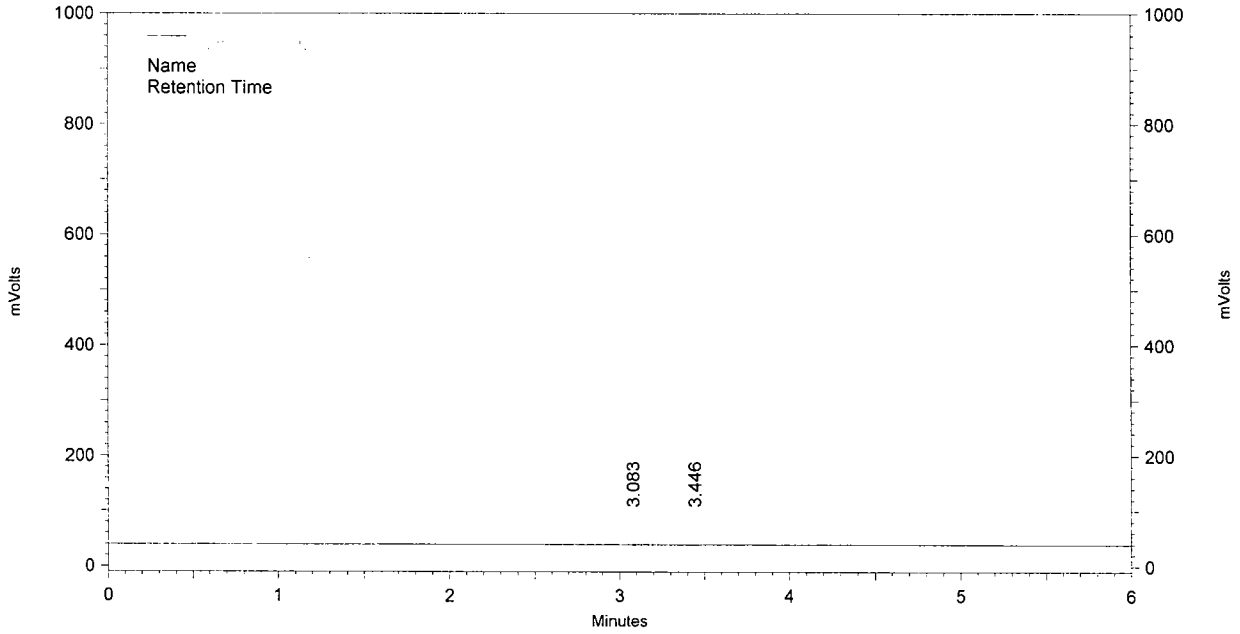
FPD Results

Name	Retention Time	Area
	3.760	6123
	3.855	3018
Totals		9141

B-145

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN10
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN10.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 1:09:13 PM
PRINTED: 11/18/2009 1:21:41 PM
USER: System



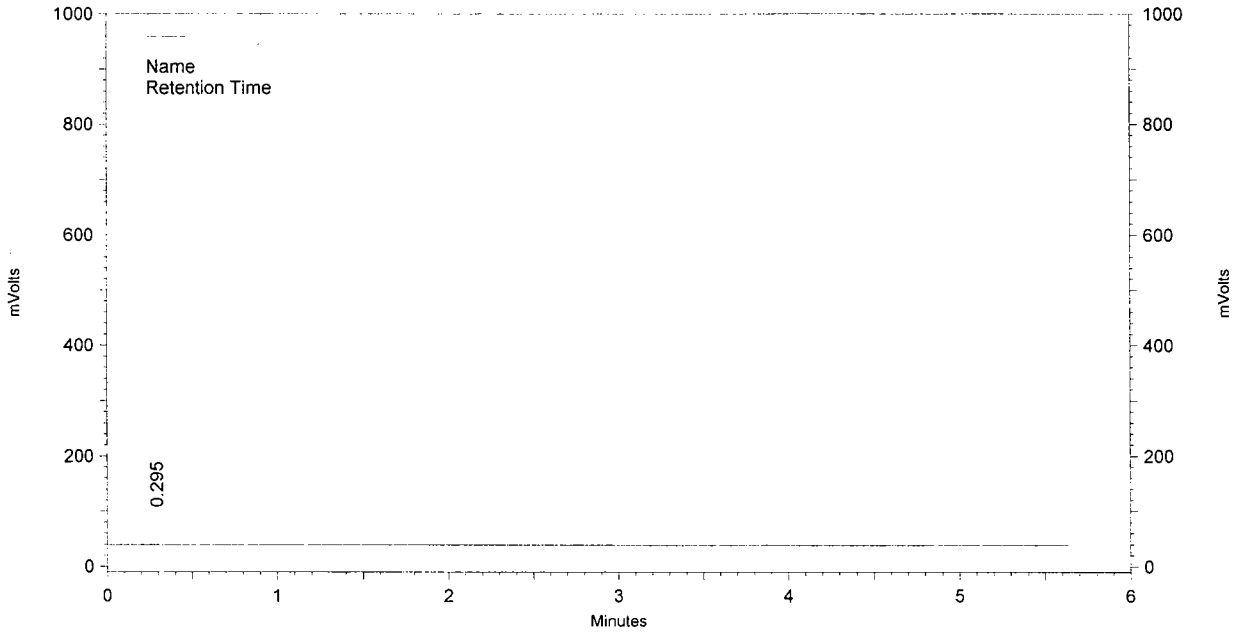
FPD Results

Name	Retention Time	Area
	3.083	2973
	3.446	2931

Totals		5904

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: H2S TEST2 RUN11
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN11.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 1:22:00 PM
PRINTED: 11/18/2009 1:27:37 PM
USER: System



FPD Results

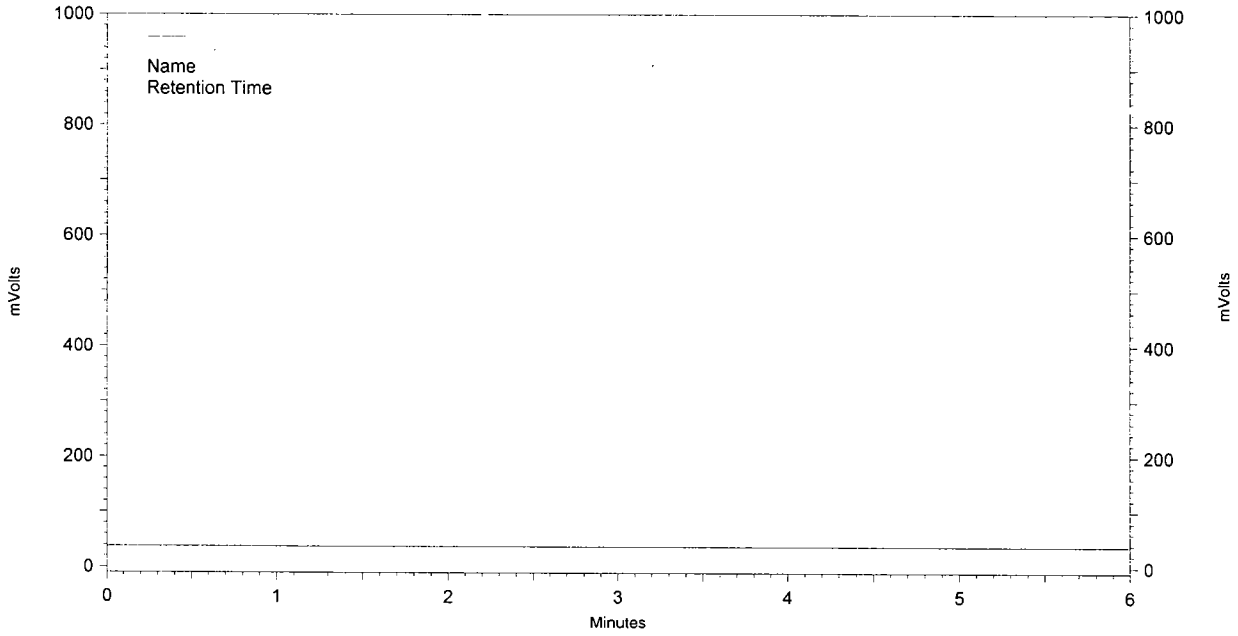
Name	Retention Time	Area
	0.295	3369

Totals		3369

B147

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN12
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN12.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 1:34:03 PM
PRINTED: 11/18/2009 1:40:07 PM
USER: System

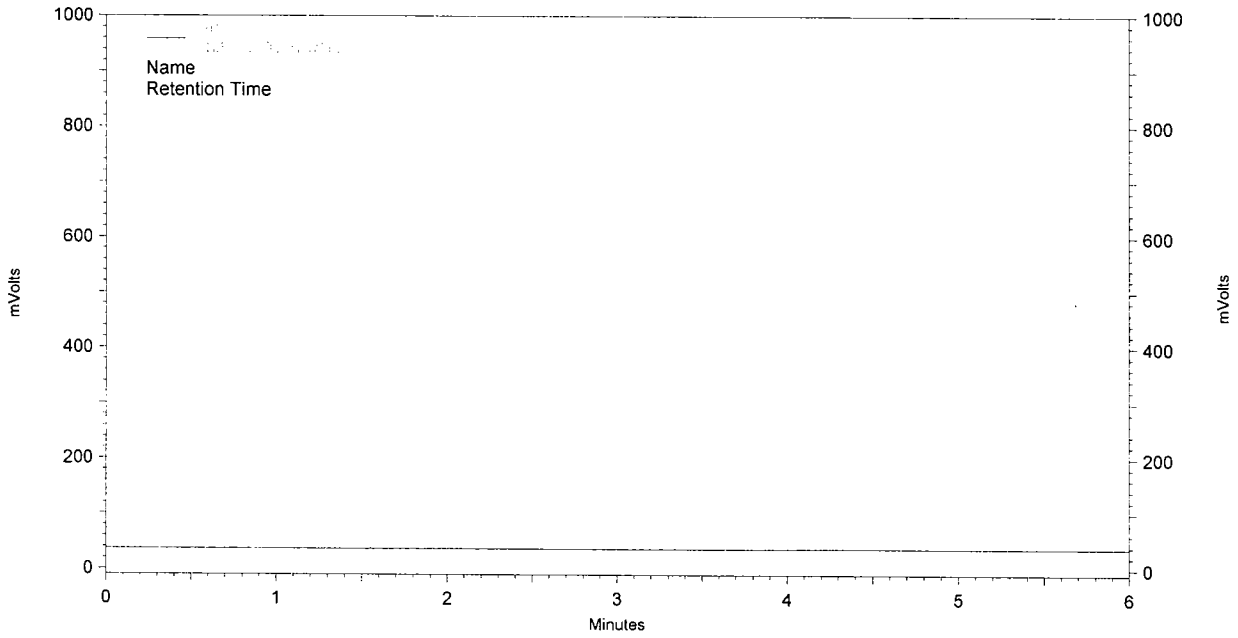


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN13
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN13.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 1:46:21 PM
PRINTED: 11/18/2009 1:52:45 PM
USER: System

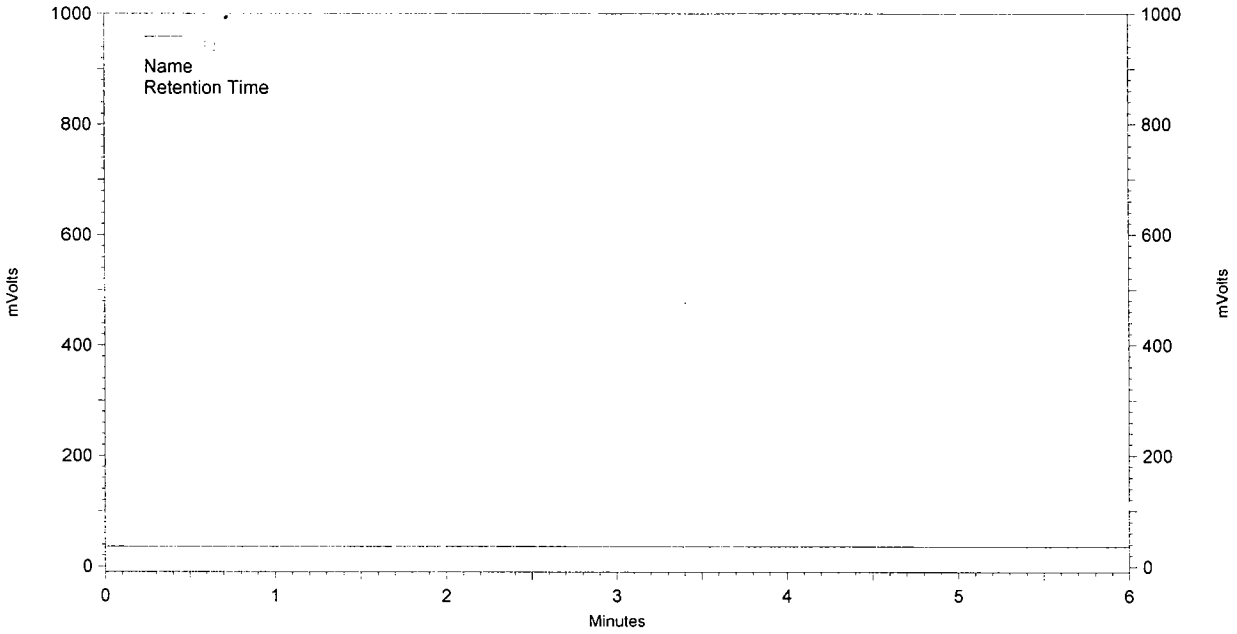


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN14
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN14.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 1:58:27 PM
PRINTED: 11/18/2009 2:05:56 PM
USER: System

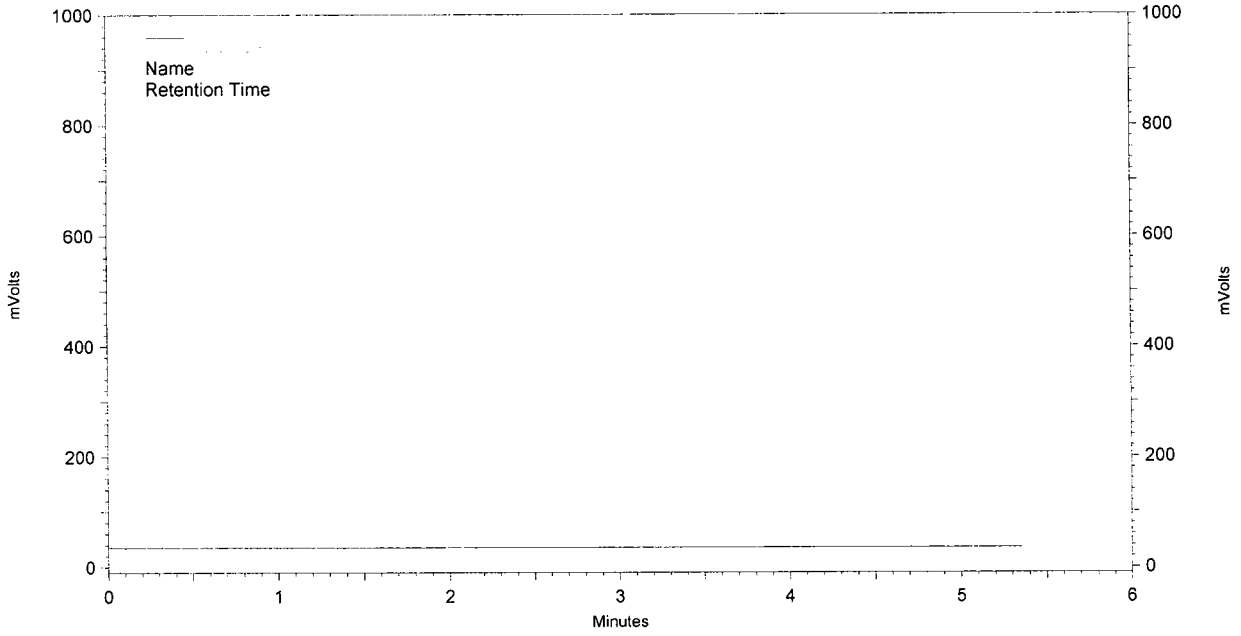


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: H2S TEST2 RUN15
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN15.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 2:10:30 PM
PRINTED: 11/18/2009 2:15:50 PM
USER: System



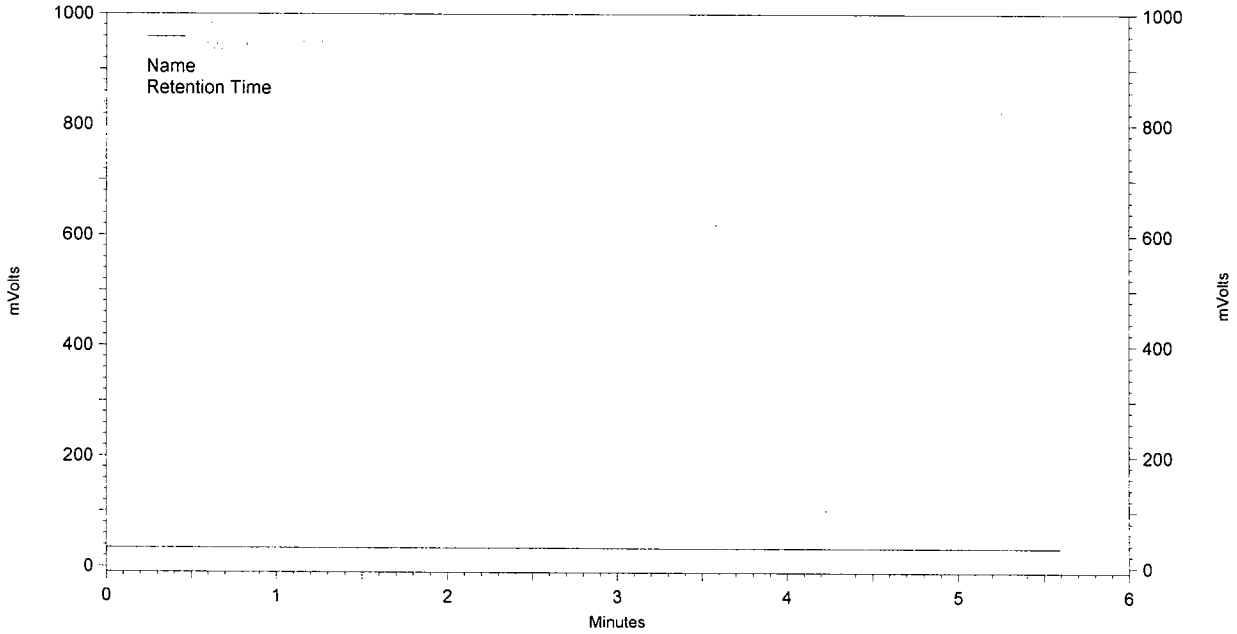
FPD Results

Name	Retention Time	Area

B-151

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: H2S TEST2 RUN16
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\TEST2RUN16.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 2:22:34 PM
PRINTED: 11/18/2009 2:28:10 PM
USER: System



FPD Results

Name	Retention Time	Area

B-152

Sulfur Analysis - GC / FPD

Test - 3

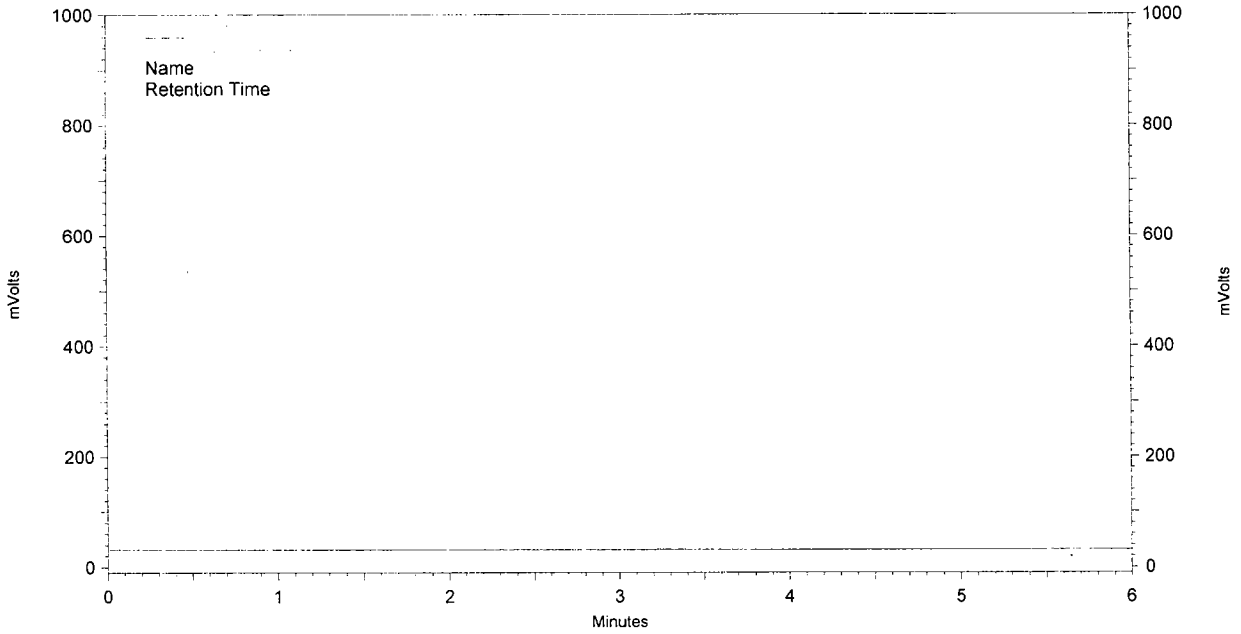
Sample Results & Raw Data

(EPA method 15)

B-15-3

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN1
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN1.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 3:15:04 PM
PRINTED: 11/18/2009 3:21:28 PM
USER: System



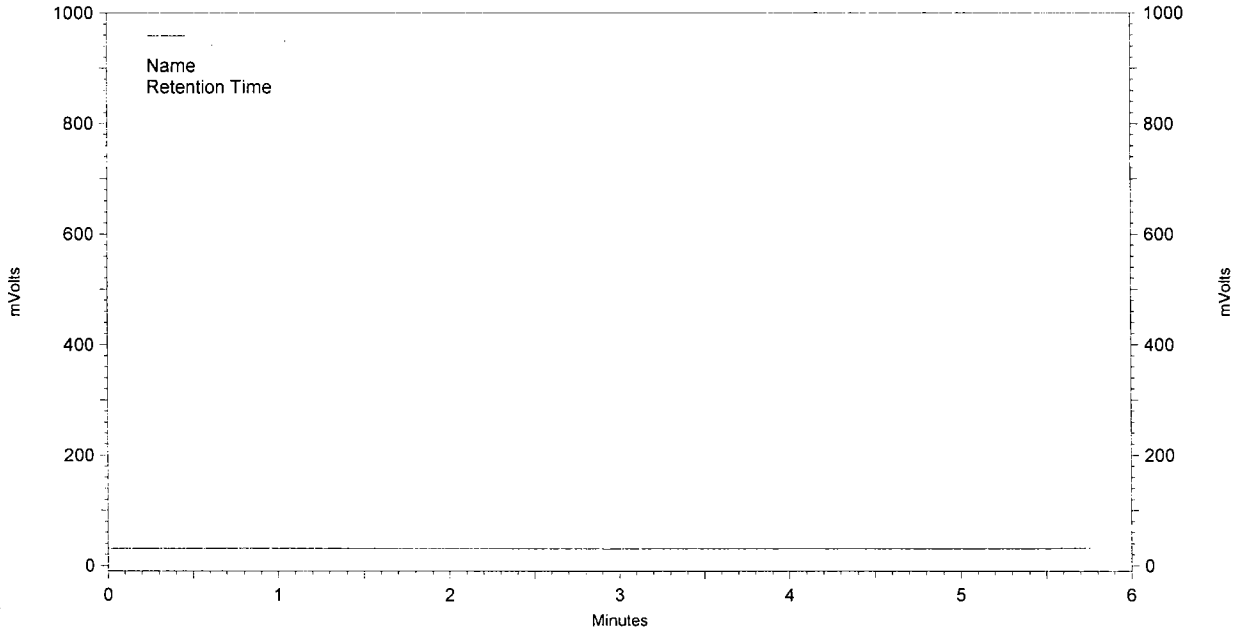
FPD Results

Name	Retention Time	Area

B154

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN2
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN2.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 3:27:16 PM
PRINTED: 11/18/2009 3:33:01 PM
USER: System



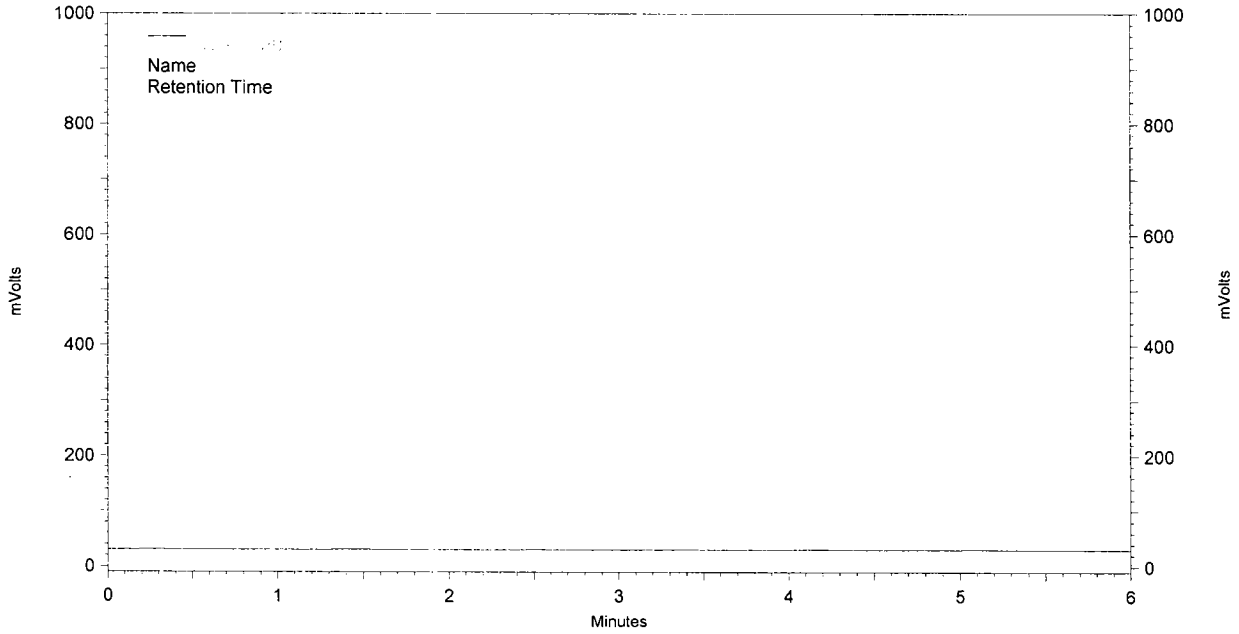
FPD Results

Name	Retention Time	Area

B-155

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN3
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN3.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 3:39:20 PM
PRINTED: 11/18/2009 3:47:56 PM
USER: System



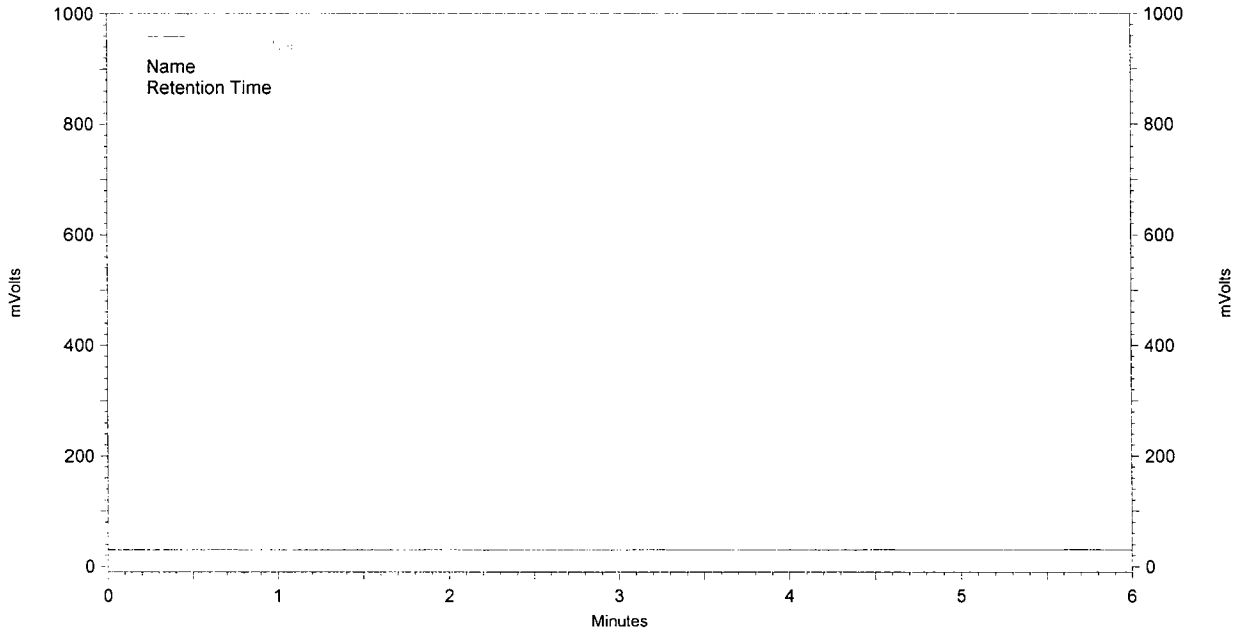
FPD Results

Name	Retention Time	Area

B156

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN4
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN4.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 3:51:31 PM
PRINTED: 11/18/2009 4:03:54 PM
USER: System

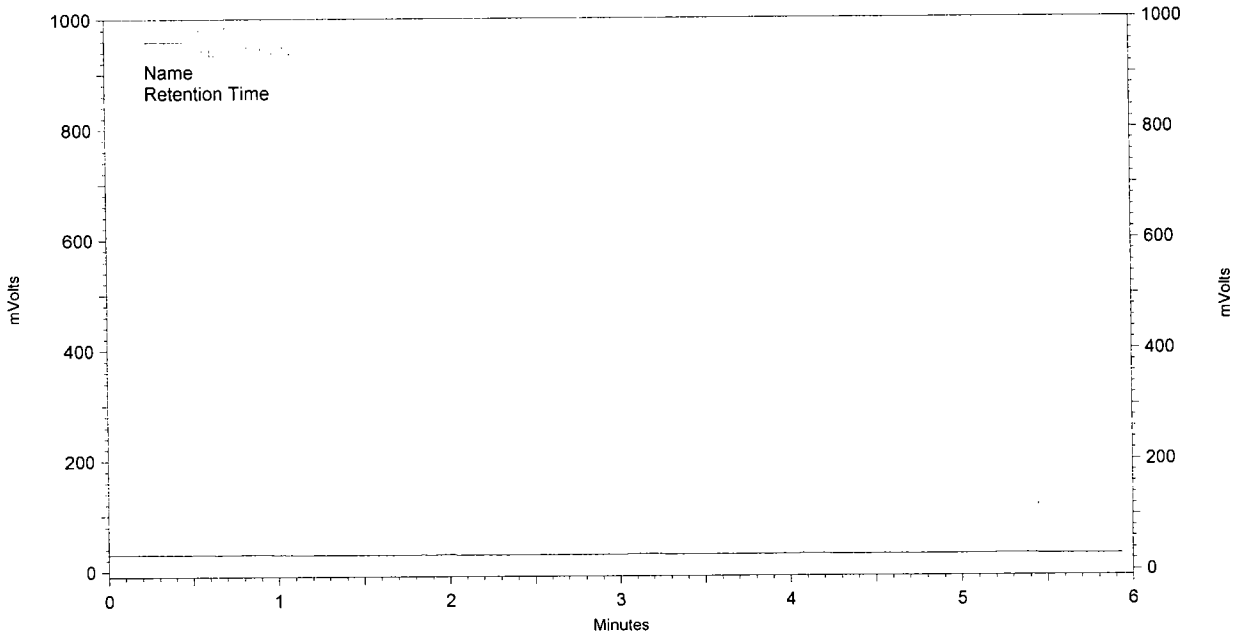


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN5
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN5.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 4:04:11 PM
PRINTED: 11/18/2009 4:10:08 PM
USER: System



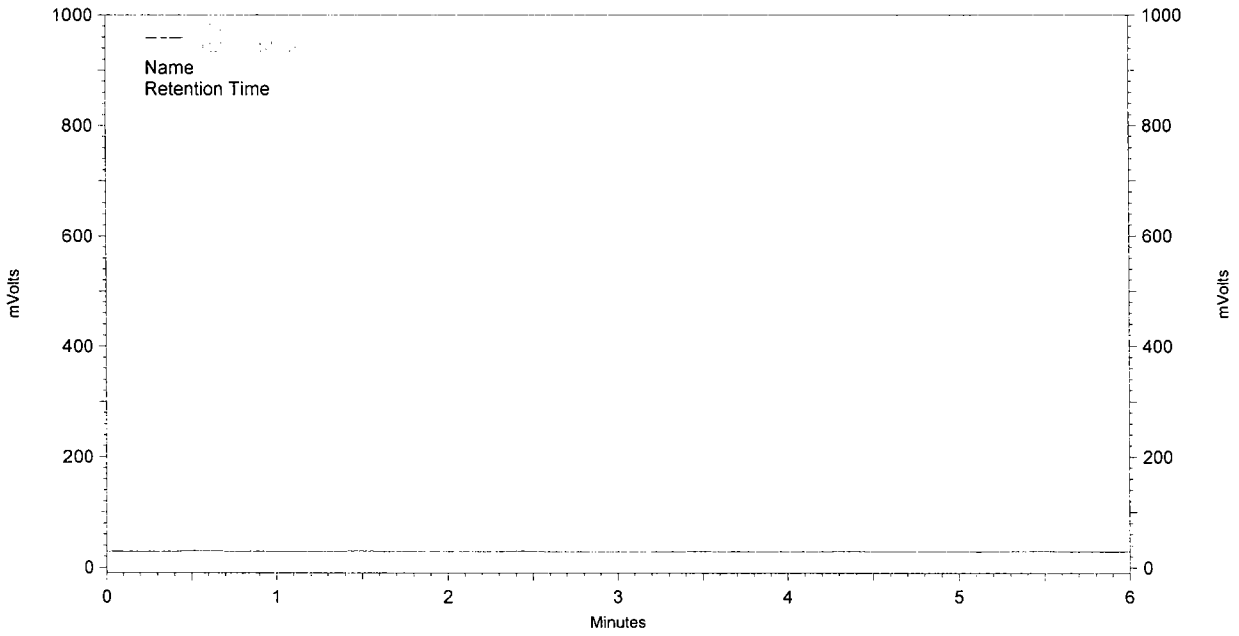
FPD Results

Name	Retention Time	Area

B158

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN6
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN6.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 4:16:15 PM
PRINTED: 11/18/2009 4:23:02 PM
USER: System

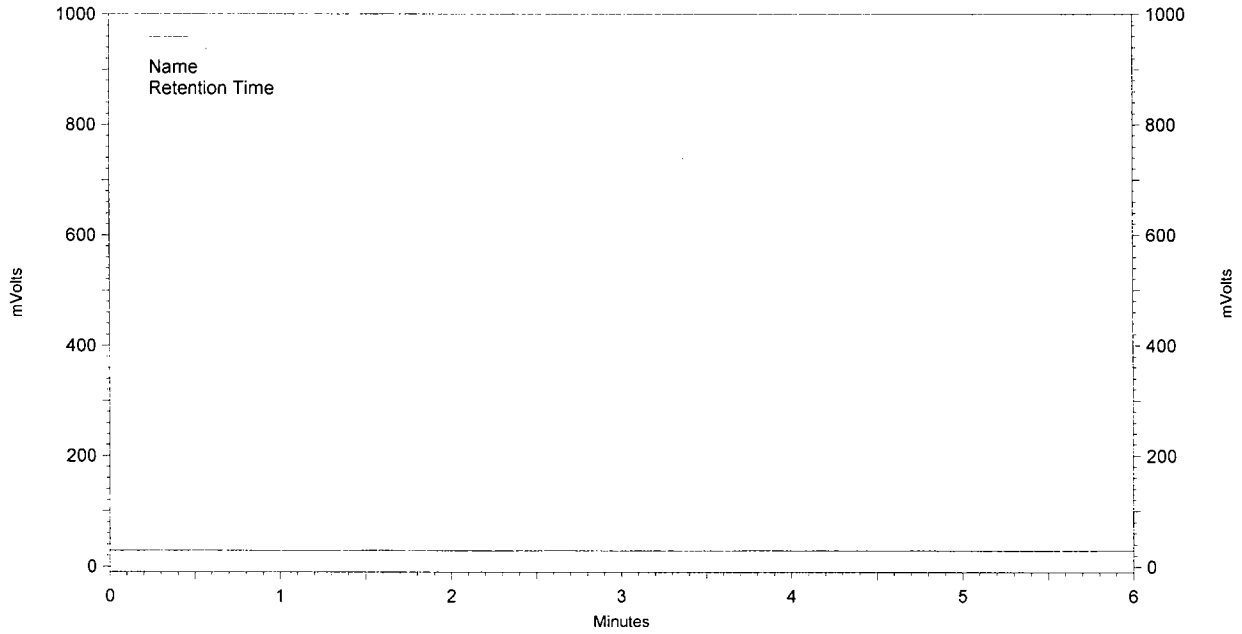


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN7
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN7.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 4:28:26 PM
PRINTED: 11/18/2009 4:34:49 PM
USER: System



FPD Results

Name	Retention Time	Area

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN8
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN8.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
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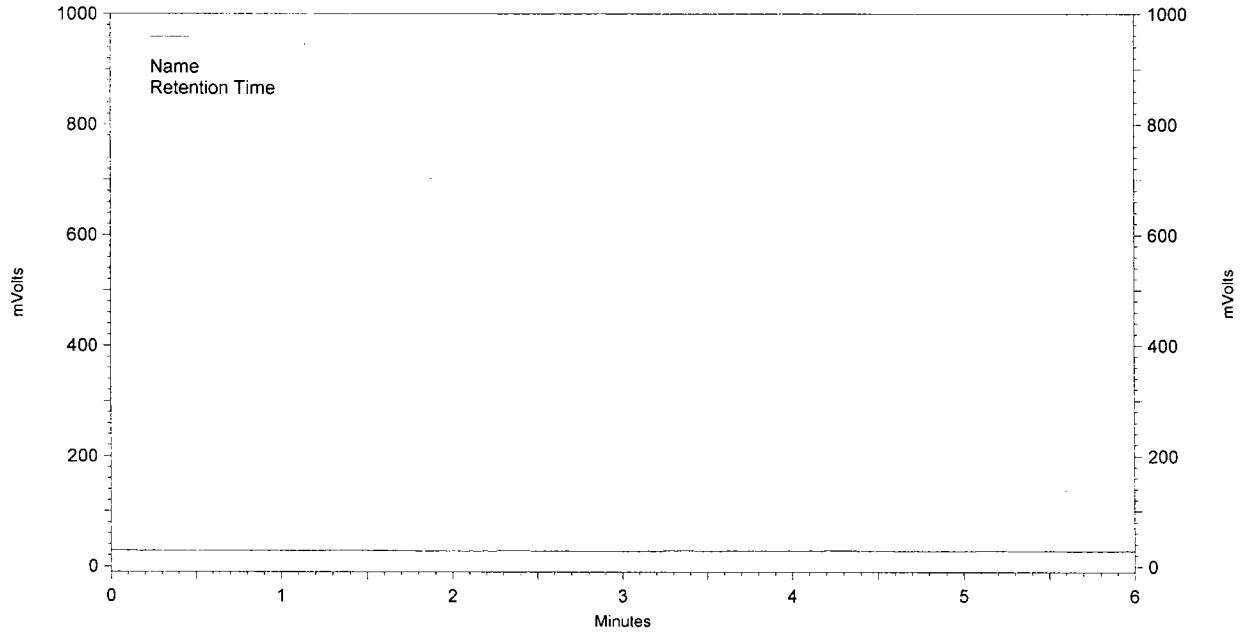
PRINTED: 11/18/2009 4:47:30 PM
USER: System



FPD Results

Name	Retention Time	Area

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN9
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN9.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
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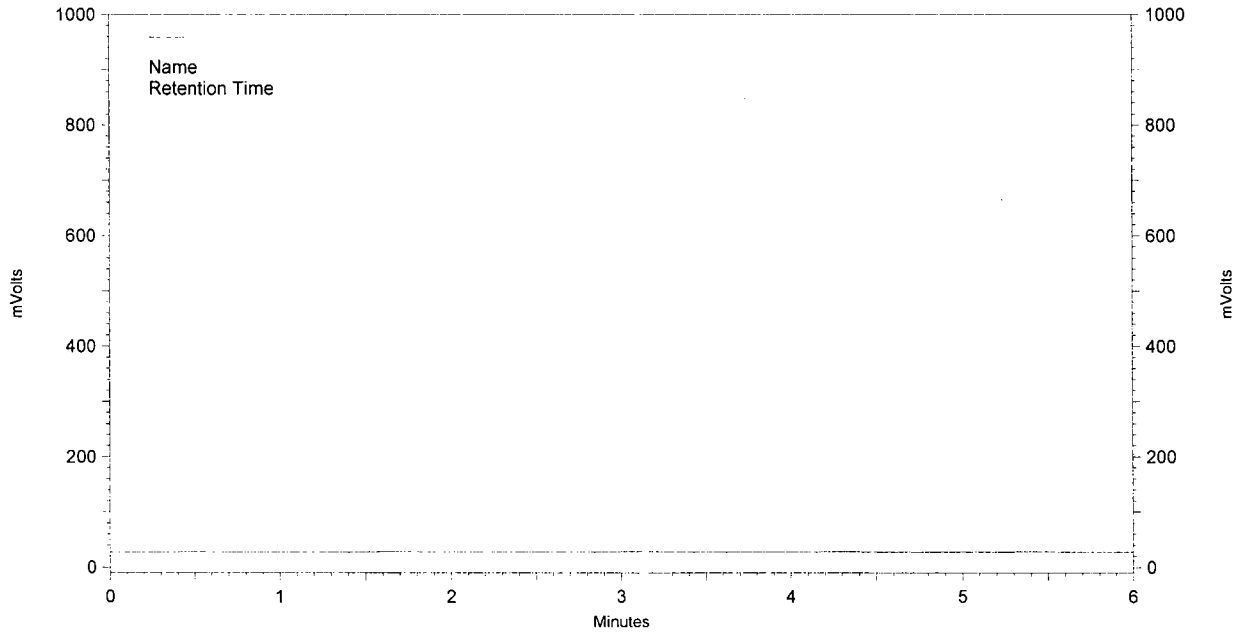

FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN10
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN10.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
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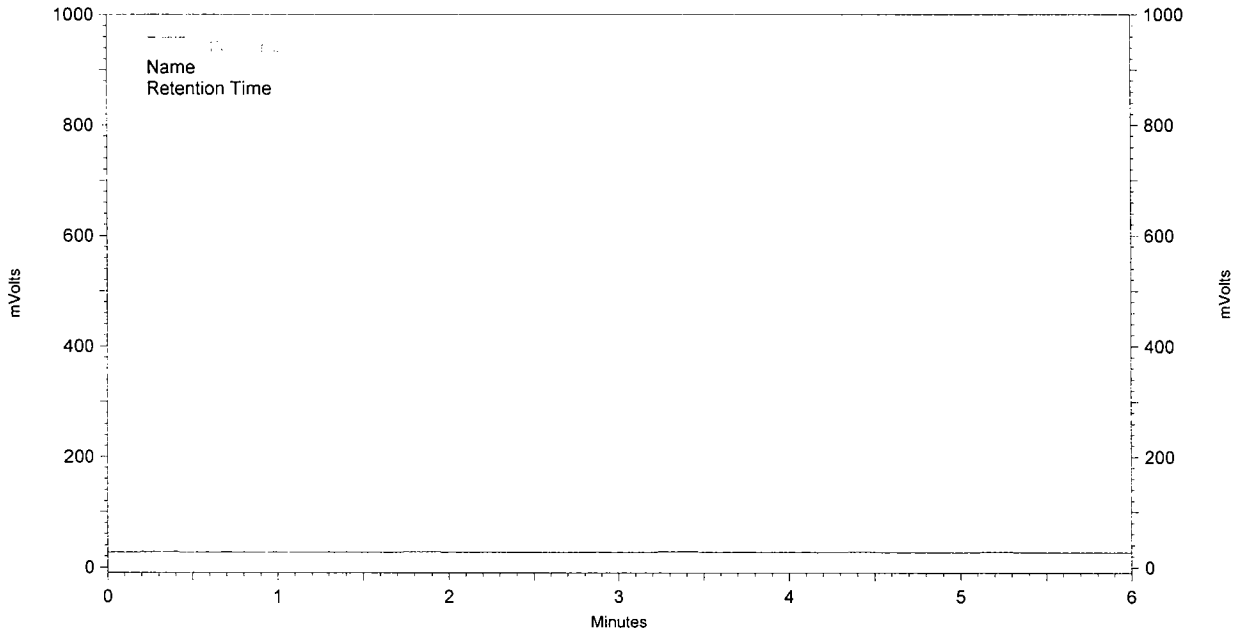
PRINTED: 11/18/2009 5:10:46 PM
USER: System

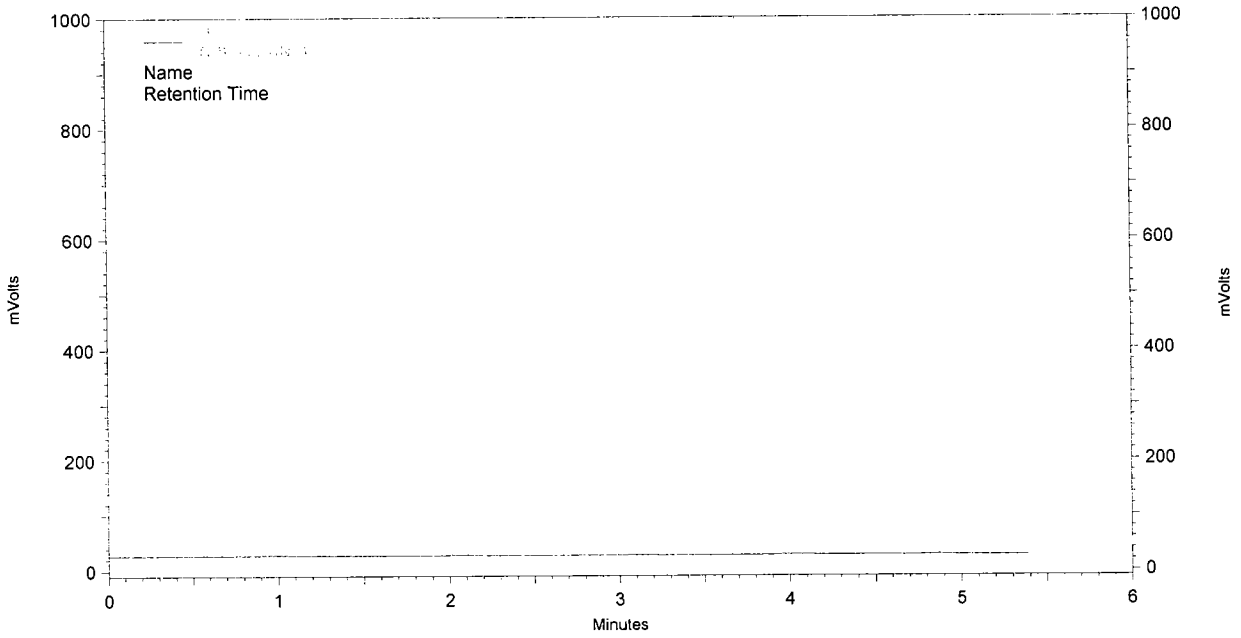


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN11
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN11.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 5:16:47 PM
PRINTED: 11/18/2009 5:22:10 PM
USER: System

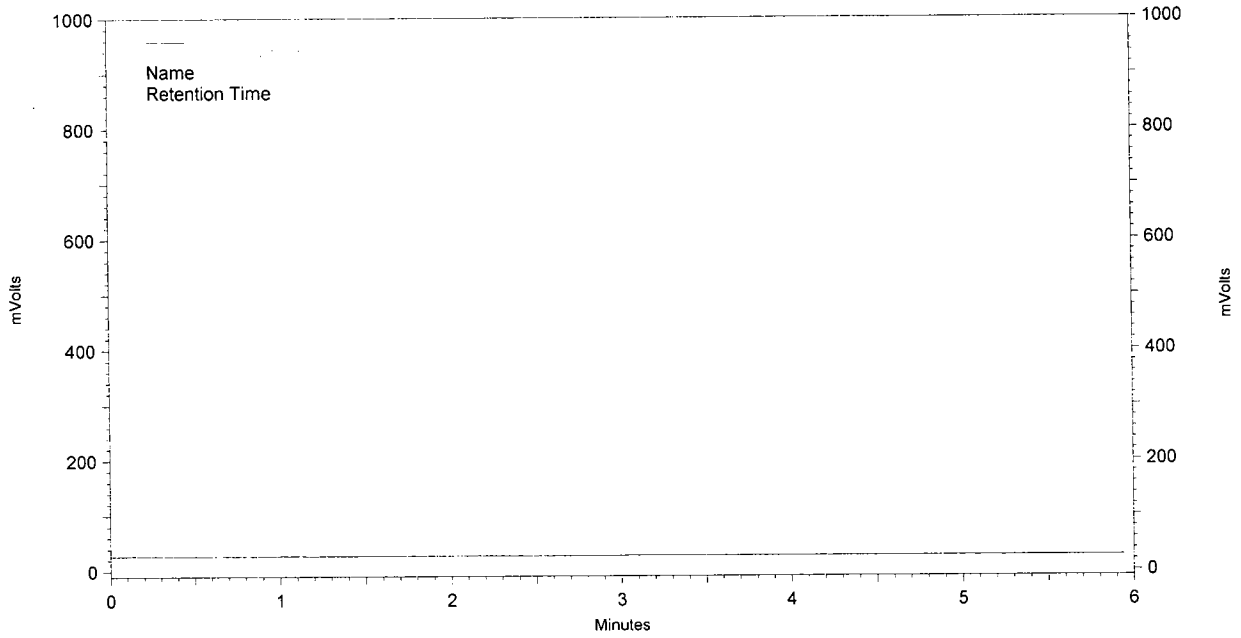


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN12
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN12.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 5:28:50 PM
PRINTED: 11/18/2009 5:34:45 PM
USER: System



FPD Results

Name	Retention Time	Area

B165

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN13
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN13.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
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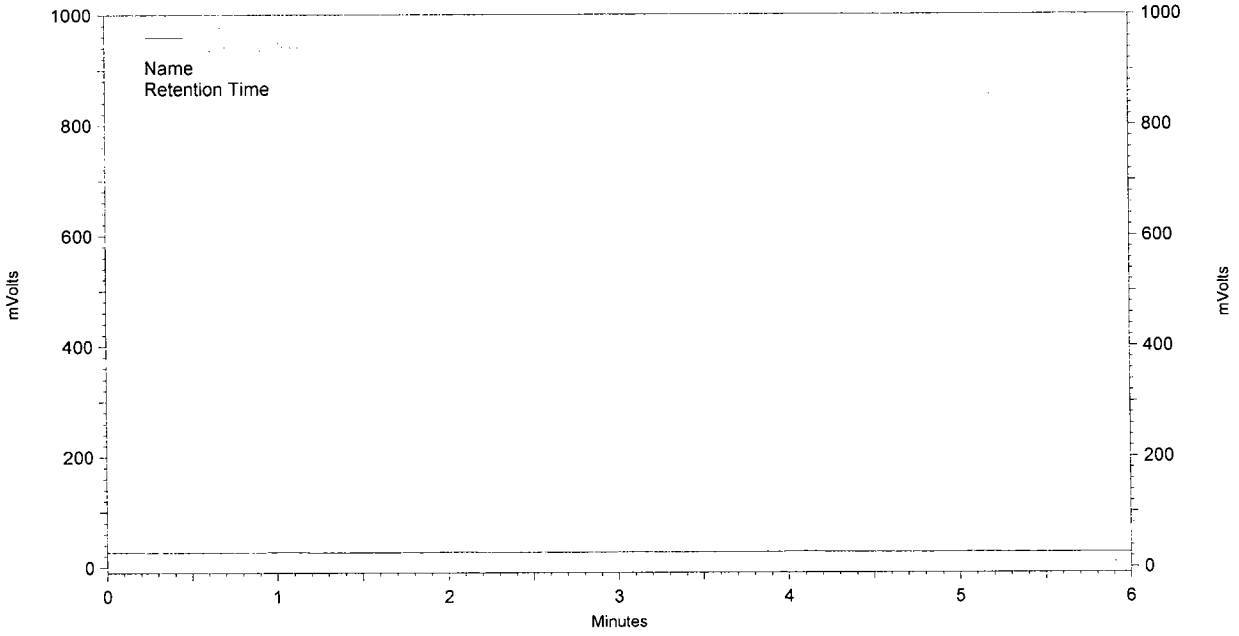
USER: System

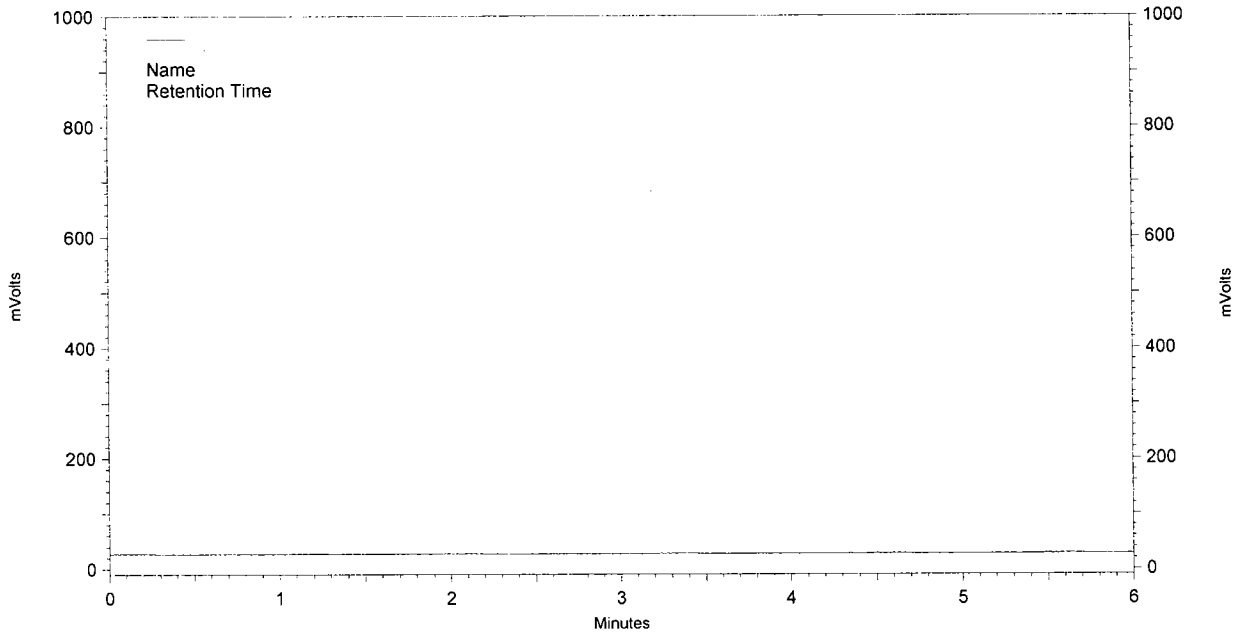


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. *League City, Texas*

SAMPLE ID: TEST-3 RUN14
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN14.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 5:53:00 PM
PRINTED: 11/18/2009 6:02:12 PM
USER: System

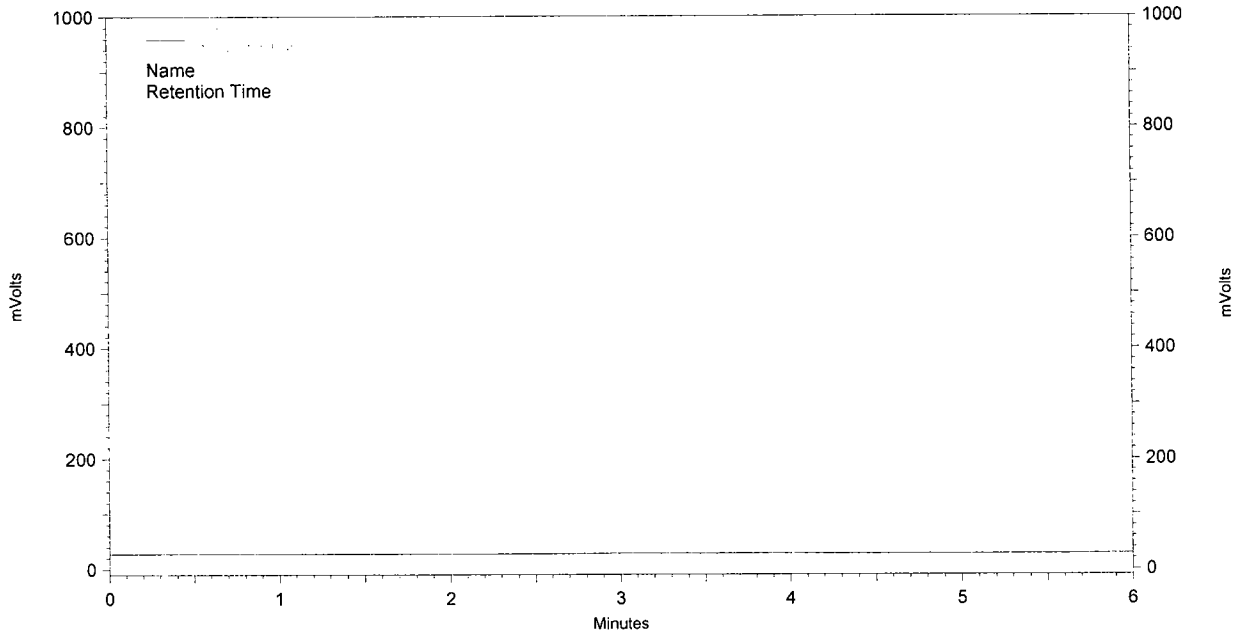


FPD Results

Name	Retention Time	Area

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN15
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN15.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 6:05:04 PM
PRINTED: 11/18/2009 6:11:06 PM
USER: System



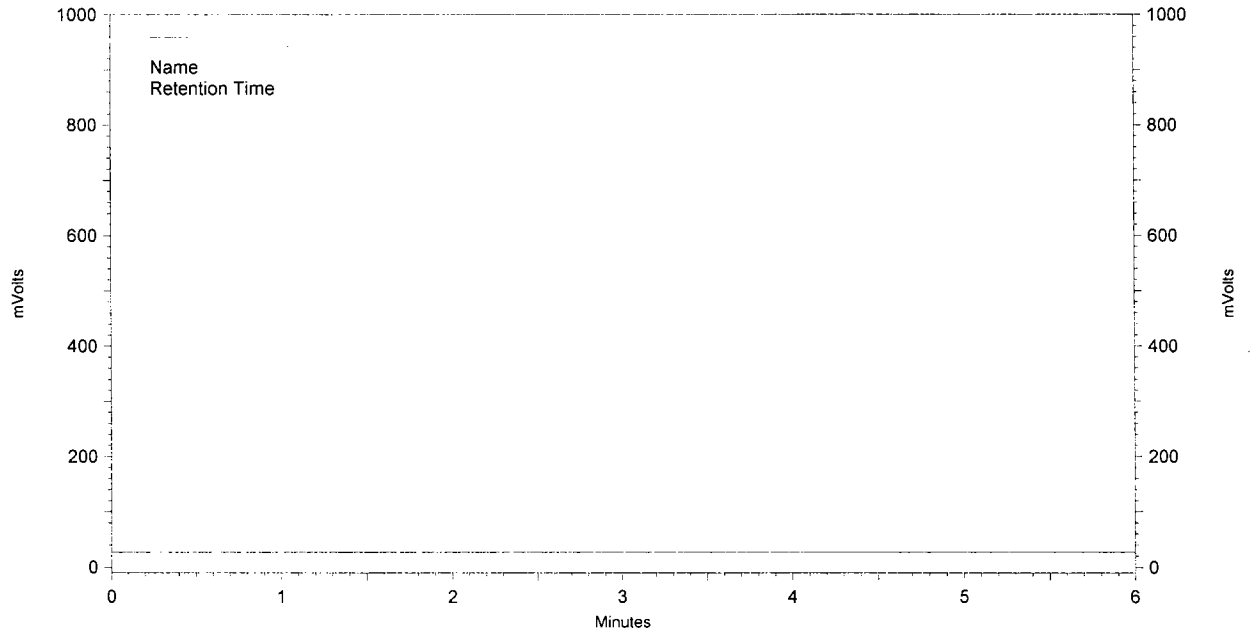
FPD Results

Name	Retention Time	Area

B168

Entech Engineering Inc. ***League City, Texas***

SAMPLE ID: TEST-3 RUN16
FILE: E:\GC DATA\2009\Sample\GC#6\ConocoPhillips\111809\T3RUN16.dat
METHOD: E:\GC DATA\2009\Calibration\GC#6\FPD_12MIN.met
ACQUIRED: 11/18/2009 6:17:08 PM
PRINTED: 11/18/2009 6:23:08 PM
USER: System



FPD Results

Name	Retention Time	Area

APPENDIX C.

EXAMPLE CALCULATIONS AND QA/QC DATA

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

EPA METHOD 2 & 4
FLOW AND MOISTURE DETERMINATION

Company	Conoco Phillips
Location	Sweeny, TX
Unit Tested	Unit 39.1 TGI (EPN 39.1-95-118)
Test Type	RM 4
FUEL PARAMETERS	
Type of Fuel Used	N/A
TEST CONDITIONS	
Test Number	1
Test Date	11/17/09
Test Site	Stack
Unit Load	Full
Sampling Elevation (feet)	150.00
Barometric Pressure, Uncorrected (inches Hg)	30.06
Barometric Pressure, Corrected (inches Hg)	29.91
Stack Internal Diameter (inches)	78.000
Stack Area at Sampling Plane (ft^2)	33.18307
SAMPLING RESULTS	
Nozzle Diameter (inches)	0.470
Nozzle Area (ft^2)	0.00120
Pitot Tube Coefficient (C_p)	0.84
Control Box Delta H Standard	1.89
Dry Gas Meter Correction Factor	1.006
Average Delta H (inches H_2O)	1.514
Average Square Root Delta P (inches $H_2O^{1/2}$)	0.2558
Average Meter Temperature (degrees F)	67.8
Sampling Time (minutes)	60
Meter Volume, Uncorrected (ft^3)	40.489
Meter Volume, Corrected (ft^3)	40.732
Meter Volume at Standard Conditions (DSCF)	40.895
Moisture Measured by Weight (g)	77.4
STACK GAS PARAMETERS	
Excess Oxygen (vol% dry)	2.71
Carbon Dioxide (vol% dry)	4.30
Temperature (degrees F)	547.5
Molecular Weight, dry	28.80
Molecular Weight, wet	27.91
Moisture Content (vol%)	8.19
Static Head (inches H_2O)	0.10
Stack Pressure (inches Hg)	29.91
Average Velocity (ft/sec)	20.17
Actual Volumeteric Flow Rate (ACFM)	40163.19
Volumetric Flow Rate (DSCFM)	19326.95
Average Isokinetic Sampling Rate (%)	98.15

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

EPA METHOD 2 & 4
FLOW AND MOISTURE DETERMINATION

Company	Conoco Phillips
Location	Sweeny, TX
Unit Tested	Unit 39.1 TGI (EPN 39.1-95-118)
Test Type	RM 4
FUEL PARAMETERS	
Type of Fuel Used	N/A
TEST CONDITIONS	
Test Number	2
Test Date	11/18/09
Test Site	Stack
Unit Load	Full
Sampling Elevation (feet)	150.00
Barometric Pressure, Uncorrected (inches Hg)	30.04
Barometric Pressure, Corrected (inches Hg)	29.89
Stack Internal Diameter (inches)	78.000
Stack Area at Sampling Plane (ft^2)	33.18307
SAMPLING RESULTS	
Nozzle Diameter (inches)	0.470
Nozzle Area (ft^2)	0.00120
Pitot Tube Coefficient (C_p)	0.84
Control Box Delta H Standard	1.89
Dry Gas Meter Correction Factor	1.006
Average Delta H (inches H_2O)	1.428
Average Square Root Delta P (inches $H_2O^{1/2}$)	0.2579
Average Meter Temperature (degrees F)	71.9
Sampling Time (minutes)	60
Meter Volume, Uncorrected (ft^3)	38.555
Meter Volume, Corrected (ft^3)	38.786
Meter Volume at Standard Conditions (DSCF)	38.603
Moisture Measured by Weight (g)	92.5
STACK GAS PARAMETERS	
Excess Oxygen (vol% dry)	3.00
Carbon Dioxide (vol% dry)	4.43
Temperature (degrees F)	548.7
Molecular Weight, dry	28.83
Molecular Weight, wet	27.73
Moisture Content (vol%)	10.15
Static Head (inches H_2O)	0.10
Stack Pressure (inches Hg)	29.89
Average Velocity (ft/sec)	20.43
Actual Volumeteric Flow Rate (ACFM)	40670.48
Volumetric Flow Rate (DSCFM)	19118.60
Average Isokinetic Sampling Rate (%)	91.76

C2

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

EPA METHOD 2 & 4
FLOW AND MOISTURE DETERMINATION

Company	Conoco Phillips
Location	Sweeny, TX
Unit Tested	Unit 39.1 TGI (EPN 39.1-95-118)
Test Type	RM 4
FUEL PARAMETERS	
Type of Fuel Used	N/A
TEST CONDITIONS	
Test Number	3
Test Date	11/18/09
Test Site	Stack
Unit Load	Full
Sampling Elevation (feet)	150.00
Barometric Pressure, Uncorrected (inches Hg)	30.04
Barometric Pressure, Corrected (inches Hg)	29.89
Stack Internal Diameter (inches)	78.000
Stack Area at Sampling Plane (ft^2)	33.18307
SAMPLING RESULTS	
Nozzle Diameter (inches)	0.470
Nozzle Area (ft^2)	0.00120
Pitot Tube Coefficient (C_p)	0.84
Control Box Delta H Standard	1.89
Dry Gas Meter Correction Factor	1.006
Average Delta H (inches H_2O)	1.738
Average Square Root Delta P (inches $H_2O^{1/2}$)	0.2564
Average Meter Temperature (degrees F)	85.8
Sampling Time (minutes)	60
Meter Volume, Uncorrected (ft^3)	41.965
Meter Volume, Corrected (ft^3)	42.217
Meter Volume at Standard Conditions (DSCF)	40.982
Moisture Measured by Weight (g)	93.5
STACK GAS PARAMETERS	
Excess Oxygen (vol% dry)	1.85
Carbon Dioxide (vol% dry)	4.47
Temperature (degrees F)	546.3
Molecular Weight, dry	28.79
Molecular Weight, wet	27.74
Moisture Content (vol%)	9.71
Static Head (inches H_2O)	0.10
Stack Pressure (inches Hg)	29.89
Average Velocity (ft/sec)	20.28
Actual Volumeteric Flow Rate (ACFM)	40375.03
Volumetric Flow Rate (DSCFM)	19116.66
Average Isokinetic Sampling Rate (%)	97.42

FLUE GAS MOISTURE CONTENT
(EPA Reference Method 4)
Test 1

Nomenclature:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.
M_w = Molecular weight of water, 18.0 lb/lb mole.
P_{bar} = Barometric pressure at dry gas meter, in Hg.
ΔH = Average pressure differential in dry gas meter, in H2O.
P_m = P_{bar} + (H/13.6)
13.6 = Specific gravity of Hg.
P_{std} = Standard absolute pressure, 29.92 in Hg.
T_{mf} = Temperature at meter, F.
T_m = Absolute temperature at meter, R.
Vm = Dry gas volume measure by dry gas meter, dcf (dry cubic feet).
Vm_{std} = Dry gas volume measured by dry gas meter corrected to standard conditions, dscf.
Vwc_{std} = Volume of water vapor collected, volumetrically measured, corrected to standard conditions, scf.
Vwg_{std} = Volume of water vapor collected, gravimetrically measured, corrected to standard conditions, scf.
V_w = Volume of water collected, ml.
W_g = Weight of water collected, g.
Y = Dry gas meter calibration factor.
K1 = Constant, 0.04707 cubic feet/ml.
K2 = Constant, 0.04715 cubic feet/g.
K3 = Constant, 17.64 R/in Hg.

Variables:

$\Delta H := 1.514 \cdot in\_H2O$

$P_{bar} := 29.91 \cdot in\_Hg$

$T_{mf} := 67.8 \cdot F$

$Vm := 40.489 \cdot ft^3$

$V_w := 0 \cdot ml$

$W_g := 77.4 \cdot g$

$Y := 1.006$

Constants:

$M_w := 18.0 \cdot \frac{lb}{lb \cdot mole}$

$P_{std} := 29.92 \cdot in\_Hg$

$K1 := 0.04707 \cdot \frac{ft^3}{ml}$

$K2 := 0.04715 \cdot \frac{ft^3}{g}$

$K3 := 17.64 \cdot \frac{R}{in\_Hg}$

Calculations:

$P_m := P_{bar} + \left(\frac{\Delta H}{13.6} \cdot \frac{in\_Hg}{in\_H2O}\right)$ $P_m = 30.021 \cdot in\_Hg$

$T_m := T_{mf} + 460$ $T_m = 527.8 \cdot R$

$Vwc_{std} := K1 \cdot V_w$ (Equation 4.1) $Vwc_{std} = 0.000 \cdot ft^3$

$Vwg_{std} := K2 \cdot W_g$ (Equation 4.2) $Vwg_{std} = 3.649 \cdot ft^3$

$Vm_{std} := K3 \cdot Y \cdot \left(\frac{Vm \cdot P_m}{T_m}\right)$ (Equation 4.3) $Vm_{std} = 40.869 \cdot ft^3$

$B_{ws} := \frac{Vwc_{std} + Vwg_{std}}{Vwc_{std} + Vwg_{std} + Vm_{std}}$ (Equation 4.4)

$B_{ws} = 0.0820$

$Moisture := B_{ws} \cdot 100 \cdot \%$

$Moisture = 8.20 \cdot \%$

MOLECULAR WEIGHT OF FLUE GAS
(EPA Reference Method 3)

Nomenclature:
M_d = Dry molecular weight, lb/lb-mole.
M_s = Wet molecular weight, lb/lb-mole.
CO_2 = Percent CO_2 by volume, dry basis.
O_2 = Percent O_2 by volume, dry basis.
CO = Percent CO by volume, dry basis.
N_2 = Percent N_2 by volume, dry basis.
Balance = N_2 + CO.
B_{ws} = Flue gas moisture fraction, by volume.

Variables:

$CO_2 := 4.30 \cdot \%$

$O_2 := 2.71 \cdot \%$

$Balance := 100 \cdot \% - CO_2 - O_2$

$Balance = 92.99 \cdot \%$

$B_{ws} = 0.0820$

Constants:

$44.0 \cdot \frac{lb}{lb \cdot mole}$ Molecular Weight of CO_2.

$32.0 \cdot \frac{lb}{lb \cdot mole}$ Molecular Weight of O_2.

$28.0 \cdot \frac{lb}{lb \cdot mole}$ Molecular Weight of N_2.

Calculations:

$$M_d := \left(44.0 \cdot \frac{lb}{lb \cdot mole} \cdot CO_2\right) + \left(32.0 \cdot \frac{lb}{lb \cdot mole} \cdot O_2\right) + \left(28.0 \cdot \frac{lb}{lb \cdot mole} \cdot Balance\right) \quad \text{(Equation 3-1)}$$

$$M_d = 28.80 \cdot \frac{lb}{lb \cdot mole}$$

$$M_s := M_d \cdot (1.0 - B_{ws}) + \left(18.0 \cdot \frac{lb}{lb \cdot mole} \cdot B_{ws}\right) \quad \text{(EPA Reference Method 2, Equation 2-5)}$$

$$M_s = 27.91 \cdot \frac{lb}{lb \cdot mole}$$

VELOCITY & VOLUMETRIC FLOW RATE OF FLUE GAS
(EPA Reference Method 2)

Nomenclature:
Diameter = Diameter of stack, in.
Area = Cross-sectional area of stack, ft^2.
B_{ws} = Flue gas moisture fraction.
C_p = Pitot tube coefficient.
K_p = Pitot tube Constant.
M_s = Molecular weight of stack gas, wet basis, lb/lb-mole.
P_{bar} = Barometric pressure at measurement site, in_Hg.
P_g = Stack static pressure, in_H2O.
P_s = Absolute stack pressure, in_Hg.
P_{std} = Standard pressure, 29.92 in_Hg.
Q_{std} = Dry volumetric stack gas flow rate, corrected to standard conditions, dscf/min.
T_{sf} = Stack temperature, F.
T_s = Absolute stack temperature, R.
T_{std} = Standard absolute temperature, 528 R.
V = Average stack gas velocity, ft/sec.
Δp = Average square root of delta p, $in\_H2O^{0.5}$.

Variables:

$Area := 33.18307 \cdot ft^2$

$C_p := 0.84$

$M_s = 27.91 \cdot \frac{lb}{lb \cdot mole}$

$P_{bar} = 29.91 \cdot in\_Hg$

$P_g := 0.01 \cdot in\_H2O$

$T_{sf} := 547.5 \cdot F$

$\Delta p := 0.2558 \cdot in\_H2O^{0.5}$

$B_{ws} = 0.0820$

Constants:

$$K_p := 85.49 \cdot \frac{ft}{sec} \cdot \left(\frac{\frac{lb}{lb \cdot mole} \cdot in\_Hg}{R \cdot in\_H2O} \right)^{0.5}$$

$T_{std} := 528 \cdot R$

$P_{std} := 29.92 \cdot in\_Hg$

Calculations:

$$T_s := T_{sf} + 460 \cdot R \qquad T_s = 1.008 \cdot 10^3 \cdot R$$

$$P_s := P_{bar} + \left(\frac{P_g}{13.6} \cdot \frac{in\_Hg}{in\_H2O} \right) \qquad P_s = 29.911 \cdot in\_Hg$$

$$V := K_p \cdot C_p \cdot \Delta p \cdot \sqrt{\frac{T_s}{P_s \cdot M_s}} \qquad \text{(Equation 2-9)}$$

$$V = 20.18 \cdot \frac{ft}{sec}$$

$$Q_{std} := 60 \cdot \frac{sec}{min} \cdot \left(1.0 - B_{ws}\right) \cdot V \cdot Area \cdot \left(\frac{T_{std}}{T_s} \right) \cdot \left(\frac{P_s}{P_{std}} \right) \qquad \text{(Equation 2-10)}$$

$$Q_{std} = 19323.69 \cdot \frac{dscf}{min}$$

ISOKINETIC SAMPLING RATE
(EPA Reference Method 5)

Nomenclature:

A_n = Cross-sectional area of nozzle tip, ft^2.
B_{ws} = Flue gas moisture content.
I = Percent of isokinetic sampling, %.
K4 = Constant
N_d = Diameter of nozzle tip, in.
N_r = Radius of nozzle tip, ft.
P_s = Absolute stack pressure
P_{std} = Standard pressure, 29.92 in_Hg
T_{sl} = Stack temperature, F
T_s = Absolute stack temperature, R
Vm_{std} = Dry gas meter volume at standard conditions, dscf.
V = Velocity of flue gas, ft/sec.
Time = Total test time, min.

Variables:

$Nd := 0.470 \cdot in$

$B_{ws} = 0.0820$

$P_s = 29.91 \cdot in\_Hg$

$T_{sf} = 547.5 \cdot F$

$T_s = 1.008 \cdot 10^3 \cdot R$

$Vm_{std} = 40.87 \cdot dscf$

$V = 20.18 \cdot \frac{ft}{sec}$

$Time := 60 \cdot min$

Constants:

$K4 := 0.09450 \cdot \frac{in\_Hg \cdot \% \cdot min}{sec \cdot R}$

$P_{std} = 29.92 \cdot in\_Hg$

$T_{std} = 528 \cdot R$

Calculations:

$$Nr := \frac{Nd}{2} \qquad Nr = 0.235 \cdot in$$

$$An := \pi \cdot \left(\frac{Nr}{12 \cdot \frac{in}{ft}} \right)^2 \qquad An = 0.00120482 \cdot ft^2$$

$$I := \frac{K4 \cdot T_s \cdot Vm_{std}}{P_s \cdot V \cdot An \cdot Time \cdot \left(1.0 - B_{ws}\right)} \qquad \text{(Equation 5-8)}$$

$$I = 97.1 \cdot \%$$

CO Emissions in lb/hr
EPA Reference Method 10 Test 1

Definitions:

CO_{conc} = CO concentration, dry ppmv.
CO_{em} = CO emission rate, lb/hr.
Qstd = Volumetric flow rate, DSCFM

Variables:

$CO_{conc} := 55.49 \cdot ppmv$

$Q_{std} := 19326.95 \cdot \frac{dscf}{min}$

Constants:

$MW_{CO} := 28.01 \cdot \frac{lb}{lb \cdot mole}$

Calculations:

$$CO_{em} := CO_{conc} \cdot \left(60 \cdot \frac{min}{hr}\right) \cdot Q_{std} \cdot \left[\frac{MW_{CO}}{385.33 \cdot \frac{dscf}{lb \cdot mole} \cdot \left(10^6 \cdot ppmv\right)}\right]$$

$CO_{em} = 4.68 \cdot \frac{lb}{hr}$

NOx Emissions in lb/hr
EPA Reference Method 7E Test 1

Definitions:

NOx_{conc} = NOx concentration, dry ppmv.
NOx_{em} = NOx emission rate, lb/hr.
Qstd = volumetric flow rate, DSCFM

Variables:

$$NOx_{conc} := 13.98 \cdot ppmv$$

$$Q_{std} := 19326.95 \cdot \frac{dscf}{min}$$

Constants:

$$MW_{NOx} := 46.00 \cdot \frac{lb}{lb \cdot mole}$$

Calculations:

$$NOx_{em} := NOx_{conc} \cdot \left(60 \cdot \frac{min}{hr}\right) \cdot Q_{std} \cdot \left[\frac{MW_{NOx}}{385.33 \cdot \frac{dscf}{lb \cdot mole} \cdot \left(10^6 \cdot ppmv\right)}\right]$$

$$NOx_{em} = 1.94 \cdot \frac{lb}{hr}$$

APPENDIX D.

INSTRUMENT SPECIFICATIONS

Shimadzu
Model 14A
Gas Chromatograph
Specifications

2. Specifications

GC1-C10893500574

■ Column oven

Dimensions of column compartment: 230 (W) X 140 (D) X 360 (H) mm

Length of columns to be accommodated:	Stainless steel column	10m X 2
	Glass column	3m X 2
	Capillary column	100m X 1
Range of temperature setting:	Temperature;	-80~+399 1°C step
	Rate of temperature rise;	0~40°C/min 0.1°C step
	Constant temperature hold time;	0~655 min 0.1°C step
	Program stages	5 stages max.

Range of temperature control (with power voltage of 100V)

Range of linear temperature increase:	30°C/min	150°C or less
	20°C/min	250°C or less
	10°C/min	330°C or less
	5°C/min	399°C or less
Lower-limit temperature:	When INJ and DET temperature is 300°C,	room temperature + 15°C
	When INJ and DET temperature is 150°C,	room temperature + 10°C
	Additional cryogenic equipment is required for controlling at lower temperatures than those above.	
Cooling speed:	Approx. 9 min to reduce from 399°C to 100°C with room temperature of 25°C.	
	Approx. 14 min for reducing from 399°C to 50°C with room temperature of 25°C	

■ Detector oven

Range of temperature setting: Room temperature ~ 399°C (in 1°C steps)

■ TCD oven

Range of temperature setting: Room temperature ~ 399°C (in 1°C steps)

■ Sample injection port unit

Range of temperature setting: Room temperature ~ 399°C

D1

Sample injection port unit (Either one of the following units is provided)

Single injection port unit:	For packed glass column, combination type of glass insert and on-column injection.	1 flow line
Dual injection port unit:	For packed glass column, combination of glass insert and on column injection.	2 flow lines
Injection port unit for for capillary columns:	Exclusive injection port for capillary analysis	

- Overheat protection circuit 3 circuits
  1. 450°C fixed independent protection circuit.
  2. Protection circuit for which the upper-limit temperature can be set via key operation.
  3. Overheat protection circuit by CPU abnormality detection
- Combination of Detectors
  1. Four detectors at maximum from among TCD, FID, ECD, FPD, and FTD can be simultaneously installed to the detector oven of the GC main body. Two TCD detectors cannot be set simultaneously.
  2. Only two types of detector controllers (except FTD) can be installed simultaneously to the control section of the GC. Another unit should be applied for installing three or more detector controllers, or FTD.

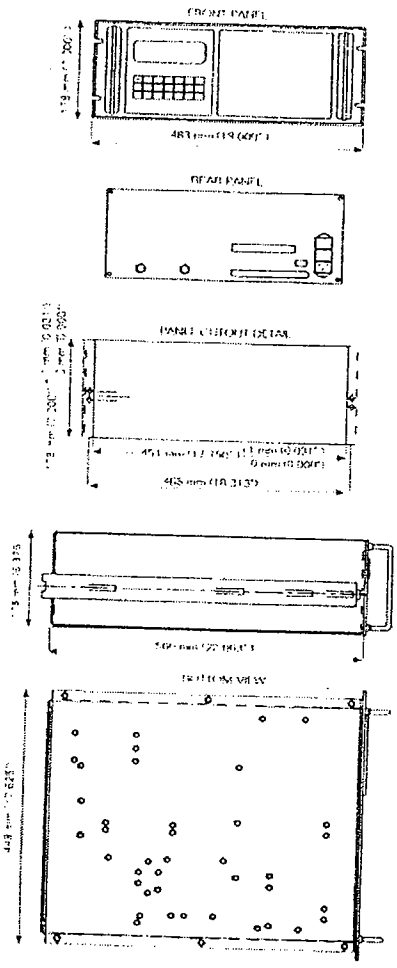
D2

MODEL 721M

SO_2, O_2 Analyzer

APPLICATIONS

- ✓ Sulfur recovery incinerators
- ✓ Coal fired power plant stack sources
- ✓ Cement kilns
- ✓ Mineral smelters
- ✓ Pulp and paper



SPECIFICATIONS

Methodology	Non-dispersive ultraviolet
Speed of response:	90% in less than 30 seconds
Accuracy:	±0.5% of full-scale (typically)
Zero drift	±0.5% of full-scale (24 hours)
Calibration	SO_2 calibration gas in nitrogen
Sensitivity:	±0.5% of full-scale
Outputs:	100 mVDC, 1 VDC, 10 VDC field selectable as standard. Optional 4 to 20 mA (isolated) Self-powered standard, loop-power available upon request.
Electrical requirement:	50 W: 120 VAC/50 to 60 Hz or 220 VAC/50 to 60 Hz
Electrical classification:	General Purpose
Typical flow:	1 to 2 L/min. (2 to 5 SCF/H)
Ambient temperature:	10 to 35°C (50 to 95°F)
Temperature stability:	0.25 ppm per Celsius degree
Electrical classification.	General purpose (non-hazardous)
Physical dimensions	HxWxD 180x480x600 mm (7x19x23.5 in.) Weight: 12.3 kg (27 lb.)

STANDARD FEATURES

Outputs
- 4 voltage outputs any combination of 0 to 100 mVDC, 0 to 1 VDC, 0 to 10 VDC

Electrical requirements
- 120 VAC/50 to 60 Hz

Measurement ranges: SO_2
- 0 to 100 ppm minimum up to 0 to 5000 ppm maximum (see note 1)
- Sample must be dry, i.e. dewpoint of the sample must be below the lowest ambient temperature at which the analyzer will be used.

Note 1: Standard cell configuration – others available

OPTIONS

Outputs
- 4 to 20 mA self-powered
- 4 current outputs (maximum 4)
- 4 to 20 mA loop-powered (available on request in place of self-powered)

Electrical requirements:
- 240 VAC/50 to 60 Hz

Optional configurations
- Low range concentration cell for full-scale ranges less than 100 ppm
- Mid-range concentration cell for applications requiring full-scale ranges between 5000 ppm and 5%
- High concentration cell for applications requiring full-scale ranges between 5% and 10%
- O_2 sensor installed in the Model 721M enclosure
- O_2 compensation
- Mass flow calculations

BOVAR
Western Research

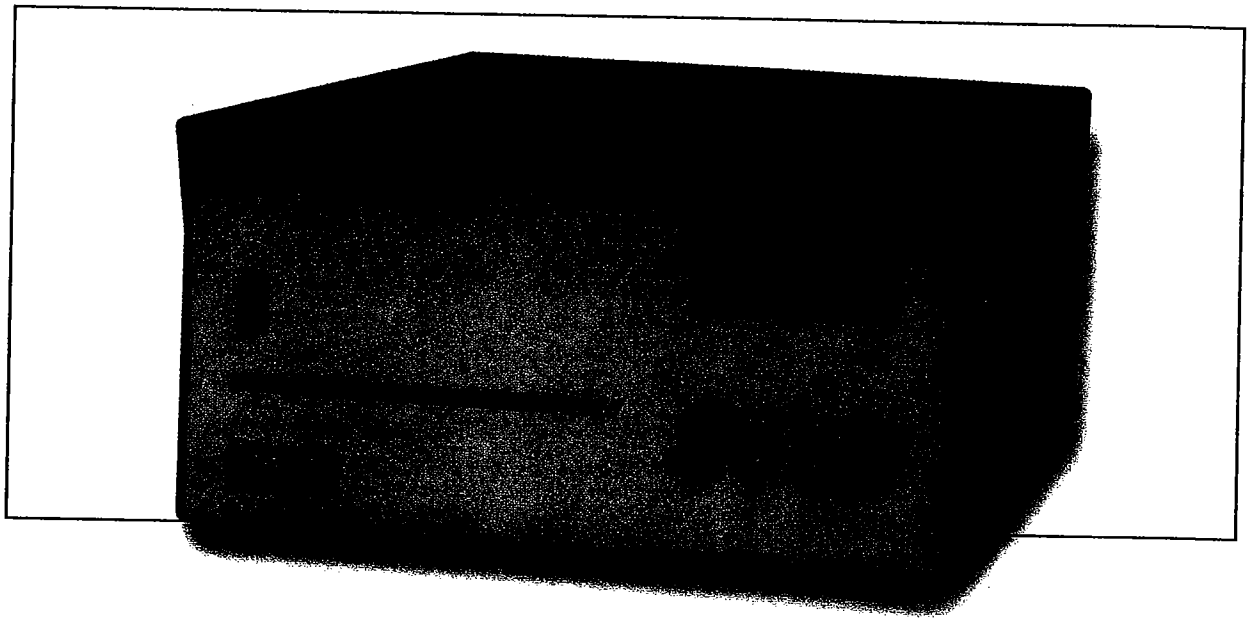
CANADA • 8 Manning Close N.E., Calgary, Alberta T2E 7N5 Phone: (403) 235-8300 Fax: (403) 248-3550
UNITED STATES • Suite 150, 10200 Richmond Avenue, Houston, Texas, USA 77042 Phone: (713) 789-1084 Fax: (713) 784-1015
EUROPE • Voltastrasse 7, D-65795 Hattersheim 1, Germany Phone: (49) 6190-8591 Fax: (49) 6190-73660
ASIA / PACIFIC • Level 28, Menara Haw Par, Jalan Sultan Ismail, 50250 Kuala Lumpur, Malaysia Phone: 60-3-233-6121 Fax: 60-3-233-6222

D3

Thermo Environmental Instruments Inc.

MODEL 42C

Chemiluminescence NO-NO_2-NO_X Analyzer

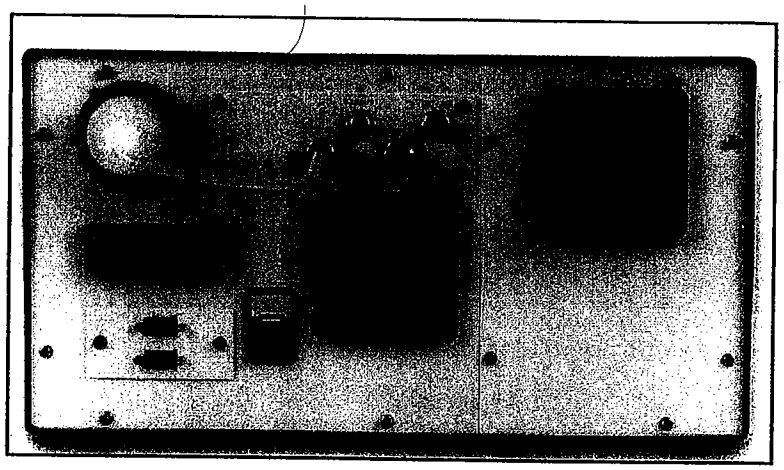


"C" SERIES TECHNOLOGY PROVIDING:

- Sub Parts Per Billion (PPB) Detection
- Electronic Diagnostic Transducers
- Multi-Line Alpha Numeric Display
- Dedicated Communications Processor
- Remote Performance Diagnostics
- U.S. EPA Designated Method (RFNA-1289-074)

FLEXIBLE COMMUNICATIONS

- Bidirectional Addressable RS-232 Communication Port
- Analog Data Outputs with Selectable Voltages
- Isolated Current Outputs (optional)
- Analog Status Outputs (optional)
- Instrument Diagnostics, local and remote



MODEL 42C SPECIFICATIONS

Ranges	0-50, 100, 200, 500, 1000 ppb and 0-1, 2.5, 10, 20, 50, 100 ppm
Noise	0.20 ppb RMS (60 second averaging time)
Lower Detectable Limit	0.40 ppb (60 second averaging time)
Zero Drift (24 hour)	<0.40 ppb
Span Drift (24 hour)	± 1% full scale
Response Time	40 sec (10 second averaging time) 80 sec (60 second averaging time) 300 sec (300 second averaging time)
Precision	± 0.4 ppb (500 ppb range)
Linearity	± 1% full scale
Sample Flow Rate	0.6 liters/min.
Operating Temperature	15° - 35° C (may be safely operated over the range of 5° - 40° C)
Power Requirements	105-125 VAC, 60 HZ 220-240 VAC, 50 HZ 300 WATTS
Physical Dimensions	16.75" (W) x 8.62" (H) x 23" (D)
Weight	53 lbs.
Outputs	Selectable voltages and RS-232 standard; 4-20 mA isolated current (optional)

Thermo Environmental Instruments Inc.

8 West Forge Pky., Franklin, MA 02038 USA
TEL: 508-520-0430 Fax: 508-520-1460

Thermo Unicam
P.O. Box 208, York Street, Cambridge CBI 2SR, England
Telephone: 44/1223374234 • Fax: 44/1223374338

Thermo Instrument Systems, GMBH
Martenerstrasse 539, 44379 Dortmund 70, WEST GERMANY
Telephone: 231 / 9613160 • Fax: 231/96131620

ThIS Analytical B.V.
Heerbaan 220, 4817 Breda, HOLLAND
Telephone: 31 / 76 / 5713717 • Fax: 31/76/5812028

Thermo Instrument Systems N.V.
Waaslandlaan 8 A3, 9160 Lokeren, Belgium
Telephone: 32 / 93 / 485841 • Fax: 32/9/3484575

Thermo Electron Nippon Co., LTD.
151 Ichinotsubo, Makishimacho, Uji-Shi, Kyoto, 611, JAPAN
Telephone: 81-774-21-2111 • Fax: 81-774-21-2240

Thermo Instrument Australia PTY., LTD
Unit 20, 38-46 South Street, Rydalmere, N.S.W. 2116, Australia
Telephone: 61-2-898-1244 • Fax: 61-2-684-4244

SPECIFICATIONS

SPECIFICATION	NONDISPERSIVE INFRARED (NDIR)				OXYGEN	
	CO	CO_2	CH_4	SO_2	O_2	O_2
DETECTOR	Microflow				Paramagnetic	Galvanic Fuel Cell
SAMPLE CONTACT MATERIAL	Stainless steel and Tygon* disposable gold plated cell liner. Window material CaF_2				Platinum, Glass, Stainless Steel, Viton and Tygon*	Stainless Steel and Tygon*
RANGES	See Table, Page 3				See Table, Page 3	See Table, Page 3
LINEARITY	Better than 1% Full Scale				Better than 1% Full Scale	Better than 1% Full Scale
REPEATABILITY	Better than 1% Full Scale				Better than 1% Full Scale	Better than 1% Full Scale
RESPONSE TIME	90% of Full Scale in less than 1 second*				90% of Full Scale in 2 seconds	90% of Full Scale in 5 seconds
SAMPLE FLOW RATE	0.5 to 2 liters/minute				1 liter/minute	1 liter/minute
NOISE	Less than 1% Full Scale				Less than 1% Full Scale	Less than 1% Full Scale
ZERO & SPAN DRIFT	Less than 1% of Full Scale in 24 hours				Less than 1% of Full Scale in 24 hours	Less than 1% of Full Scale in 24 hours
ZERO & SPAN, ADJUSTMENT	Ten turn potentiometer				Ten turn potentiometer	Ten turn potentiometer
DISPLAY	Individual 4½ digit panel meter				3½ digit panel meter	3½ digit panel meter
OUTPUTS	Select: 0-10VDC or 4-20 or 0-20mA (RS-232 optional)				Select: 0-10VDC and 4-20 or 0-20mA (RS-232 optional)	Select: 0-10VDC and 4-20 or 0-20mA (RS-232 optional)
ALARMS (optional)	2 each Form C - 10A SPDT and Form A-5A SPST (Dry Relay Contacts)				Single or Dual SPDT-5A (Dry Relay Contacts)	Single or Dual SPDT-5A (Dry Relay Contacts)
AMBIENT TEMPERATURE	-5 to 45°C				-5 to 45°C	-5 to 45°C
SAMPLE TEMPERATURE	0 to 50°C				0 to 50°C	0 to 50°C
SAMPLE CONDITION	Clean, non-condensing gas				Clean, non-condensing gas	Clean, non-condensing gas
FITTINGS	1/4" tube				1/4" tube	1/4" tube
POWER REQUIREMENTS	115/220/240 VAC, 50/60 Hz, 70 watts/channel				115/220/240 VAC, 50/60 Hz, 70 watts/channel	115/220/240 VAC, 50/60 Hz, 70 watts/channel
DIMENSIONS	5¼"H x 19"W x 22"D 133mm x 483mm x 559mm				5¼"H x 19"W x 15"D 133mm x 483mm x 381mm	5¼"H x 19"W x 15"D 133mm x 483mm x 381mm
RELATIVE HUMIDITY	Less than 90% R.H.**				Less than 90% R.H.**	Less than 90% R.H.**
WEIGHT (single unit)	24 lbs. (approximate) 10.8 Kg				15 lbs. (approximate) 6.8 Kg	10 lbs. (approximate) 4.8 Kg

*Depending on cell length and flow rate **Non-condensing

Specifications are subject to change without notice.

APPENDIX E.

EQUIPMENT CALIBRATIONS

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

METER BOX CALIBRATION
WET TEST METER (SN# P2768)

Date: **10/23/09**

Barometric Pressure: 30.00

Meter box number: **1**

Sample Line Vacuum Hg		Orifice manometer setting ΔH in. H2O	Spirometer (wet meter) gas volume Vw (ft3)	Dry gas meter volume Vm (ft3)	Temperatures: Spirometer (wet meter) tw °F	Dry Gas Meter: Inlet ti °F	Dry Gas Meter: Outlet to °F	Dry Gas Meter: Average tm °F	Time θ min	Spirometer (wet meter) Vacuum Pw in. H2O
5.0	Start	0.5	7709.000	503.650	80		76			
	End		7714.000	508.600	80		78	77.0	12.40	0.7
	Volume		**5.000**	**4.950**	80					
5.0	Start	1.0	7714.000	508.600	80		78			
	End		7719.000	513.565	80		80	79.0	8.70	1
	Volume		**5.000**	**4.965**	80					
5.0	Start	2.0	7719.000	513.565	80		80			
	End		7724.000	518.535	80		81	80.5	6.35	1.8
	Volume		**5.000**	**4.970**	80					
5.0	Start	3.0	7724.000	518.535	80		81			
	End		7729.000	523.490	80		82	81.5	5.30	2.8
	Volume		**5.000**	**4.955**	80					
5.0	Start	4.0	7729.000	523.490	80		82			
	End		7734.000	528.457	80		83	82.5	4.45	3.5
	Volume		**5.000**	**4.967**	80					

Calculations

$$\gamma = \frac{(Vw)\,(Pb-(Pw/13.6))(tm+460)}{(Vm)\,(Pb + (H/13.6))\,(tw + 460)}$$

$$\Delta H@ = \frac{(0.0317)\,(\text{Delta H})}{(Pb)\,(to + 460)} \left[\frac{(tw + 460)\,(\theta)}{(Vw)}\right]^2$$

ΔH	Δ	ΔH@	Condition
0.5	1.002	1.77	OK
1	1.000	1.73	OK
2	0.998	1.84	OK
3	0.998	1.92	OK
4	0.993	1.80	OK
Average	**0.998**	**1.81**	

K-factor = (Volume (ft)3) X (γ) X (Meter Temp (F)+460) / (B.P.) X (Time)

0

Thermocouple Readout Calibration

NIST Tracable Simulator Make: Omega Model: CL540K S.N. 105823

Type-K Simulator	Stack **	Probe **	Filter **	Last Imp.**	Aux **	Meter In **	Meter Out **
0	1	1	1	1	1	1	1
50	50	50	50	50	50	50	50
100	99	99	99	99	99	99	99
200	199	199	199	199	199	199	199
500	502	502	502				
1000	1001						
1900	1900						

**Note: all temperatures are in °F

Sign: Tim Harris Date: 10-23-09

EI

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

METER BOX CALIBRATION
WET TEST METER (SN# P2768)

Date: **12/08/09**

Barometric Pressure: 30.15

Meter box number: **1**

Sample Line Vacuum Hg		Orifice manometer setting ΔH in. H2O	Spirometer (wet meter) gas volume Vw (ft3)	Dry gas meter volume Vm (ft3)	Temperatures: Spirometer (wet meter) tw °F	Dry Gas Meter Inlet ti °F	Dry Gas Meter Outlet to °F	Dry Gas Meter Average tm °F	Time θ min	Spirometer (wet meter) Vacuum Pw in. H2O
5.0	Start	0.5	7761.000	799.884	68		68	69.0	12.40	0.7
	End		7766.000	804.850	69		70			
	Volume		**5.000**	**4.966**	68.5					
5.0	Start	1.0	7766.000	804.850	69		70	71.0	9.00	1
	End		7771.000	809.805	70		72			
	Volume		**5.000**	**4.955**	69.5					
5.0	Start	2.0	7771.000	809.805	70		72	72.5	6.50	1.8
	End		7776.000	814.756	69		73			
	Volume		**5.000**	**4.951**	69.5					
5.0	Start	3.0	7776.000	814.756	69		73	73.5	5.30	2.8
	End		7781.000	819.670	69		74			
	Volume		**5.000**	**4.914**	69					
5.0	Start	4.0	7781.000	819.670	69		74	74.5	4.50	3.5
	End		7786.000	824.594	70		75			
	Volume		**5.000**	**4.924**	69.5					

Calculations

$$\gamma = \frac{(Vw)\,(Pb-(Pw/13.6))(tm+460)}{(Vm)\,(Pb + (H/13.6))\,(tw + 460)}$$

$$\Delta H@ = \frac{(0.0317)\,(\text{Delta H})}{(Pb)\,(to + 460)} \left[\frac{(tw + 460)\,(\theta)}{(Vw)} \right]^2$$

ΔH	Δ	ΔH@	Condition
0.5	1.005	1.71	OK
1	1.007	1.80	OK
2	1.006	1.87	OK
3	1.012	1.86	OK
4	1.006	1.79	OK
Average	**1.007**	**1.80**	

$$\text{K-factor} = \frac{(\text{Volume (ft)3 }) \text{ X } (\gamma) \text{ X } (\text{Meter Temp (F)+460})}{(\text{B.P.}) \text{ X } (\text{Time})}$$

Thermocouple Readout Calibration

NIST Tracable Simulator Make: Omega Model: CL540K S.N. 105823

Type-K Simulator	Stack **	Probe **	Filter **	Last Imp.**	Aux **	Meter In **	Meter Out **
0	1	1	1	1	1	1	1
50	50	50	50	50	50	50	50
100	99	99	99	99	99	99	99
200	199	199	199	199	199	199	199
500	502	502	502				
1000	1001						
1900	1900						

**Note: all temperatures are in °F

Sign: _____ Date: 12.8.09

E2

OMEGA ENGINEERING INC.
An OMEGA Technologies Company

Certificate Of Calibration

for

ENTECH ENGINEERING

Cust. P.O. #:	52257	Model #:	CL540K
Omega W.O. #:	809948892	Serial #:	105823
Report #:	081810	Recal Date:	11-Sep-09

CAL-3

Omega Engineering, Inc. certifies that the above instrumentation has been calibrated and tested to **meet or exceed** the published specifications. This calibration and testing was performed using instrumentation and standards that are traceable to the **National Institute of Standards and Technology**. This calibration is in compliance with ISO 10012-1, ISO 9001 Section 4.11 and ANSI/NCSL Z540-1-1994. This Certificate/Report shall not be reproduced, except in full, without written consent of Omega Engineering, Inc.

Test Conditions: 22 C Relative Humidity: 40%

Test Equipment	NIST Traceable Test Number(s)
Hewlett Packard 34401A	775585-5985307: 1168883856
Omega TRC-III	OM-80310864

Metrology Technician

Thomas Keyes
Quality Assurance Inspector

Calibration Date: 11-Sep-08

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Page 1 of 2

OMEGA ENGINEERING INC.
An OMEGA Technologies Company

Calibration Worksheet per ISO 10012-1

A R No:

Model No: CL540K

Serial No: 105823

Report No: 081810

Maximum Calibration System Uncertainty: 9ppm Rdg+3ppm Rng(mVDC)
Procedure: QAP-2100
Note: OOT denotes out of tolerance condition otherwise, UUT has passed published specifications.

UUT	Standard (Measurement)	Standard (Measurement)
Output	As Found	As Left
0.0 KC	-0.003 mVDC=-0.1 C	As Found
350.0 KC	14.292 mVDC=350.0 C	
700.0 KC	29.132 mVDC=700.1 C	
1050.0 KC	43.215 mVDC=1050.1 C	
1360.0 KC	54.487 mVDC=1360.3 C	

Test Equipment	S/N	Asset	Calibration Due
Hewlett Packard 34401A	US36030996	01109	17-Dec-08
Omega TRC-III	I-0006	01158	17-Sep-08

OMEGA Engineering, Inc., One Omega Drive, Box 4047, Stamford, CT 06907 Telephone: (203) 359-1660 • FAX: (203) 359-781
www.omega.com e-mail: info@omega.com

E4

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Temperature Measurement Device Calibration

Device ID: T36-F3 Calibration Date: 01/16/09

Device Type: Type K Thermocouple

Person Performing Calibration: J. Vawter

Reference Standard Type: Mercury Thermometer Reference Standard Calibration Date: 08/06/08

NIST Traceble Standard Manufacturer: ICL Calibration Laboratories Inc.

NIST Traceble Standard Serial No. C92043

Calibration Point	Measurement Range	Thermocouple		Reference Standard		Percent Deviation	Pass / Fail Specification
		°F	°R	°F	°R		
1	Cold	32.4	492.4	32.0	492.0	-0.08%	Pass
2	Ambient	74.5	534.5	76.0	536.0	0.28%	Pass
3	Elevated 1	229.0	689.0	227.0	687.0	-0.29%	Pass
4	Elevated 2	644.0	1104.0	641.0	1101.0	-0.27%	Pass

Specification: Percent deviation ≤ 1.5% of reference temperature.

I hereby certify the temperature measurement device as being accurate to within the acceptable specification:

Signature: Jared Vawter

Date: 1-16-09

ICL CALIBRATION LABORATORIES, INC.

ACCREDITED
CERT. 526.01 CALIBRATION

ISO/IEC 17025 and ANSI/NCSL Z540-1 accredited
The specialists in ASTM and laboratory thermometers & hydrometers
Members: ASTM API NCSLI ASQ NCWM

Setting new standards in calibration excellence!

1501 Decker Avenue Suite 118 Stuart, FL 34994 USA
Tel: 772 286 7710 1-800-713-6647
Fax: 772 286 8737 E-mail: sales@iclcalibration.com
Internet: www.icllabs.com

CALIBRATION REPORT FOR THERMOMETER

Report No. S168354 Page 1 of 3

THE INSTRUMENT DESCRIBED BELOW WAS EXAMINED AND TESTED IN ICL'S ISO/IEC 17025 ACCREDITED CALIBRATION LABORATORY, USING NIST TRACEABLE REFERENCE STANDARDS, IN ACCORDANCE WITH ICL'S ISO/IEC 17025 CALIBRATION PROCEDURE REFERENCED BELOW. THIS CALIBRATION MEETS THE REQUIREMENTS OF ISO/IEC 17025, ANSI/NCSL Z540-1-1994, (WHICH SUPERCEDED AND REPLACED MIL-STD 45662A), AND THE ISO-9000 AND QS-9000 SERIES OF QUALITY STANDARDS.

CUSTOMER INFORMATION

ENTECH ENGINEERING, INC.
408 EAST MAIN STREET
LEAGUE CITY, TX 77573

PURCHASE ORDER NUMBER: NOT AVAILABLE

SUBMITTED BY: ENTECH ENGINEERING, INC.

INSTRUMENT INFORMATION

DATE REPORT ISSUED: 09-11-2009

THERMOMETER ASTM 3F-99 MODEL NUMBER: 10003F-C

SERIAL NUMBER: 1675 INSCRIPTION: LSW

ENGINEERING UNITS: degrees Fahrenheit RANGE: 20/760F DIVISIONS: 2 °F

IMMERSION: 76MM

ACCURACY TOLERANCE (maximum scale error permitted by ASTM E 1): +/- 2.0F TO 574F, +/- 3.0F ABOVE 574F

RESULTS OF PHYSICAL EXAMINATION

THIS INSTRUMENT WAS EXAMINED UNDER A POLARIZED LENS AND STRAINS IN THE GLASS, IF ANY, WERE JUDGED TO BE MINIMAL AND OF NO DETRIMENT TO THE FUNCTION OF THE INSTRUMENT.

THE CAPILLARY OF THIS THERMOMETER WAS EXAMINED UNDER MAGNIFICATION WITH RESULTS AS FOLLOWS: NO FOREIGN MATERIAL, MOISTURE, OR OTHER EVIDENCE OF CONTAMINATION WERE DISCOVERED. NO DISCERNABLE CAPILLARY IRREGULARITIES WERE NOTED.

IT WAS DETERMINED THAT THIS INSTRUMENT IS IN GOOD WORKING ORDER AND IS THEREFORE SUITABLE FOR CALIBRATION.

CALIBRATION PROCEDURE USED: *ICL Procedure 01, which is based upon ASTM E 77, NBS Monograph 150 & NIST SP 250-23*

RESULTS OF CALIBRATION

NOTE: The indications of this instrument cannot be adjusted or modified by ordinary means; accordingly, the readings given in the table below should be considered, in effect, to be both 'As Found' and 'As Left' readings.

The values and corrections presented herein are derived, or calculated, data as required by ASTM method E 77 for the calibration of this ASTM partial immersion thermometer. Raw data (actual observations) obtained in the performance of this calibration and an explanation of the calculations are presented on Page 3 of this report.

TEST TEMP	READING	CORRECTION	ACCEPT LIMIT* (+ or -)	P/M/F	ASTM SPECIFIED STEM TEMP	UNCERTAINTY
32.00°F	30.2°F	+1.8°F	2.00°F	PASS	70°F	0.83°F
200.00°F	200.3°F	-0.3°F	2.00°F	PASS	90°F	0.83°F
370.00°F	370.9°F	-0.9°F	2.00°F	PASS	101°F	0.83°F
540.00°F	540.9°F	-0.9°F	2.00°F	PASS	110°F	0.83°F
700.00°F	700.9°F	-0.9°F	3.00°F	PASS	129°F	0.84°F

**ACCEPT LIMIT(s) The acceptance limit(s) shown above represent a statistical evaluation of the instrument's tolerance relative to the uncertainty of the measurement. If required, the acceptance limit is set to a value smaller than the tolerance. The difference between the tolerance and the acceptance limit is the 'guard band'. The guard band is imposed to reduce the probability of a false acceptance (PFA), or a false failure, to 2% or less.*

P/M/F Accordingly, there are three possible calibration outcomes:

1. *PASS The calibration result falls within the interval described by the test point + or - (the tolerance MINUS the guard band).*
2. *MARG** (marginal) The calibration result is 'borderline', or indeterminate; it is therefore statistically and metrologically imprudent to declare that the instrument is definitively either 'in-tolerance' or 'out-of-tolerance'.*
3. *FAIL The calibration result falls outside the interval described by the test point + or - (the tolerance PLUS the guard band).*

The methodology and equations used for determination of guard bands and acceptance limits comply with the requirements of ANSI/NCSL Z540.3

THE TEST POINTS LISTED IN THE ABOVE TABLE ARE THOSE SPECIFIED IN ASTM E 1 (CURRENT REVISION).
Our best measurement capabilities are: at Liquid Nitrogen (approximately -196C), +/- 0.0062C; from -80 to 0C, +/- 0.0089C; at 0C,

E6

+/- 0.0039C; at 0.01C (TPW), +/- 0.0019C; from 0.01 to 100C, +/- 0.0085C; from 100 to 200C, +/- 0.0094C; from 200 to 300C, +/- 0.0098C; from 300 to 420C, +/- 0.014C; from 420 to 500C, +/- 0.034C; from 500 to 700C, +/- 0.26C; from 700 to 1000C, +/- 0.86C. These uncertainties have been calculated utilizing the methods recommended in NIST Technical Note 1297 and the ANSI-NCSL document Z-540-2 entitled 'Guide to the Expression of Uncertainty in Measurement'. A coverage factor of 2 sigma (k = 2) has been applied to the standard uncertainty in order to express the expanded uncertainty at (approximately) a 95% confidence level.

THE UNCERTAINTIES PRESENTED ABOVE IN THE 'RESULTS' TABLE ARE LARGER THAN OUR BEST MEASUREMENT CAPABILITIES, AS THE RESOLUTION OF THIS INSTRUMENT, ESTIMATED TO BE 0.2°F, AND OTHER CONTRIBUTIONS HAVE BEEN FACTORED INTO THE CALCULATION.

BECAUSE THIS IS A PARTIAL IMMERSION THERMOMETER, AN ADDITIONAL 0.6°F HAS BEEN FACTORED INTO THE UNCERTAINTY CALCULATION AS SUGGESTED BY NIST IR 5341.

THE EXPANDED UNCERTAINTIES (K = 2) REPORTED HERE DO NOT CONTAIN ESTIMATES FOR (1) ANY EFFECTS THAT MAY BE INTRODUCED BY TRANSPORTATION OF THE INSTRUMENT BETWEEN ICL AND THE USER'S LABORATORY, (2) DRIFT OF THE INSTRUMENT, (3) HYSTERESIS OF THE INSTRUMENT, OR (4) ANY MEASUREMENT UNCERTAINTIES INTRODUCED BY THE USER.

FOR A DISCUSSION OF ACCURACIES ATTAINABLE WITH THERMOMETERS SUCH AS THIS INSTRUMENT SEE NIST SPECIAL PUBLICATION 250-23, NIST PUBLICATION IR-5341, ASTM E 1 AND ASTM E 77.

LABORATORY ENVIRONMENTAL CONDITIONS: TEMPERATURE: 23°C +/- 2°C RELATIVE HUMIDITY: BETWEEN 40% AND 65%

ALL TEMPERATURES GIVEN IN THIS REPORT ARE THOSE DEFINED BY THE INTERNATIONAL TEMPERATURE SCALE OF 1990 (ITS-90)

** IMPORTANT NOTE: THE READINGS AND CORRECTIONS NOTED ABOVE APPLY FOR THE CONDITION OF IMMERSION INDICATED PROVIDED THE ICE POINT READING, TAKEN AFTER EXPOSURE FOR NOT FEWER THAN THREE DAYS TO A TEMPERATURE OF ABOUT 23 DEGREES CELSIUS (73F), IS 30.2°F. IF THE ICE POINT READING IS FOUND TO BE HIGHER (OR LOWER) THAN STATED, ALL OTHER READINGS WILL BE HIGHER (OR LOWER) BY THE SAME AMOUNT.

THIS CALIBRATION WAS PERFORMED BY: DEBORAH M. WEBER

THE CALIBRATION PERFORMED AND DOCUMENTED BY THIS REPORT OF TEST IS A FULL SCALE CALIBRATION AND NO LIMITATIONS OF USE ARE IMPOSED ON THIS INSTRUMENT.

TRACEABILITY INFORMATION

This calibration is traceable to NIST through an unbroken chain of comparisons. The reference standard is used to calibrate the transfer standard, which in turn is used to calibrate the client's instrument. Each step in the chain is fully documented, and measurement uncertainty at each step has been calculated.

Our NIST primary reference thermometer from -196 to 420C is a Rosemount model 162CE 25.5 Ohm SPRT, serial no. 5206, calibrated by NIST on April 1, 2009. NIST GMP-11 recommends a 36 month calibration cycle for SPRTs. PRT transfer standards and ASTM liquid-in-glass transfer standards are calibrated annually against this SPRT, per NIST GMP-11 recommendations.

Our primary reference thermometer for temperatures from 500 to 1000C is a Hart Scientific model 5624 PRT sensor, serial #0105, calibrated by Hart Scientific. PRT and noble metal thermocouple transfer standards are calibrated annually against this reference sensor, per NIST GMP-11 recommendations.

Test Point	Comparator	MTE#	Manufacturer	Transfer Standard	MTE#	Manufacturer	Next Due
32.00°F	Ice bath	000	Lab Glass	Ice bath	222	Lab Glass	10/06/09
200.00°F	7310 oil bath	005	PolyScience	5628-15 PRT 1211	271	Hart Scientific	06/02/10
370.00°F	6022 oil bath	021	Hart Scientific	5628-15 PRT 1111	286	Hart Scientific	06/02/10
540.00°F	6045 salt bath	004	Hart Scientific	5628 PRT 0523	228	Hart Scientific	10/07/09
700.00°F	6050H salt bath	016	Hart Scientific	5628 PRT 0523	228	Hart Scientific	10/07/09

ICL CALIBRATION LABORATORIES, INC.

An ISO/IEC 17025 & ANSI/NCSL Z-540-1 accredited laboratory - American Association for Laboratory Accreditation Certificate #526.01

J. JEFF KELLY, TECHNICAL DIRECTOR
DEBORAH M. WEBER, A.S.C.P. ACCREDITED TECHNOLOGIST This document prepared by LORI PARR and reviewed by KAREN DOMINGUEZ

DATE REPORT ISSUED: 09-11-2009 RECALIBRATION DATE SPECIFIED BY CLIENT: September 11, 2010

NIST GMP-11 (Mar '03), 'Good Measurement Practice for Assignment and Adjustment of Calibration Intervals for Standards' states that, 'Temperature standards are dynamic with use. Shock, contamination and other factors can cause drift from accepted values'. Table 4 of GMP-11 recommends recalibration of liquid-in-glass thermometers, standard thermistors and PRTs at 12 month intervals. Liquid-in-glass thermometers used for 'Temperature Critical Parameters' should be recalibrated at 6 month intervals. NIST GMP-11 is available for download in Adobe .pdf format on our website at www.icllabs.com Follow the link for 'Downloads'.

The API 'Manual of Petroleum Measurement Standards', Chapter 7, June, 2001, specifies a 12 month recalibration interval for liquid-in-glass thermometers (see section 8.3) and for portable electronic thermometers (PETs). See section 8.2

The user should be aware that any number of factors may cause this instrument to drift out of calibration before the specified calibration interval has expired.

E7

RAW DATA

The actual raw data obtained during testing of this instrument is as follows:

Test temperature	Reading	Emergent column temp (To)	degs of emergent stem (n)
32.00°F	30.2°F	71°F	89
200.00°F	200.2°F	86°F	257
370.00°F	370.2°F	84°F	427
540.00°F	539.8°F	89°F	597
700.00°F	698.8°F	98°F	757

THE ABOVE READINGS WERE MADE UNDER MAGNIFICATION AND RESOLVED TO ONE TENTH OF ONE SCALE DIVISION.

Because the temperature of the emergent stem (the portion of the mercury column above the bath, exposed to room temperatures) realized during testing differs from the ASTM E 1 specified emergent stem temperatures (assumed to be the conditions of actual or intended use of the instrument), the method requires that an emergent stem temperature correction be calculated and applied. This is explained fully in ASTM E 77, section 7, Treatment of Data.

The calculation utilized is:

$$\text{Emergent stem correction} = kn(Ts - To)$$

where:

k = differential expansion coefficient of the liquid and the glass of which the themometer is made; for Celsius mercury-in-glass thermometers the value of k is 0.00016, for Fahrenheit mercury-in-glass thermometers k=0.00009 For Celsius organic liquid-in-glass thermometers k=0.001, and for Fahrenheit organic liquid-in-glass thermometers k=0.0006

n = number of (scale) degrees of liquid column emergent from the bath, as measured from the immersion mark to the top of the mercury column. The ungraduated portion of the stem between the immersion mark and the beginning of the scale is evaluated and included into the value of n.

Ts = the emergent stem temperature specified in ASTM E 1, table 4

To = observed average temperature of the emergent liquid column of n degrees

This calculation has been performed for each temperature tested, and, as required by ASTM E 77, the results have been incorporated into the readings and corrections which appear under RESULTS OF CALIBRATION on page 1 of this report.

E8

ilac-MRA ACCREDITED Calibration Certificate No. 1750.01

Calibration complies with ISO/IEC 17025 AND ANSI/NCSL Z540-1

Cert. No.: 4015-1806859

Traceable® Certificate of Calibration for Total-Range Thermometer

Instrument Identification: I-6

Model: 4015 S/N: 80148561 Manufacturer : Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Thermocouple Calibrator	00633877	11/29/08	1000235086

Certificate Information:

Technician: 76 Procedure: CAL-4015-06 Cal Date: 2/04/08 **Cal Due: 2/03/10**

Test Conditions: 23.0°C 52.0 %RH 1012 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±uc	TUR
°C		N.A.		0.000	0.3	Y	-1.0	1.0	0.360	2.8:1
°C		N.A.		1,000.000	999.8	Y	998.0	1,002.0	0.760	2.6:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±uc=Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Date=MM/DD/YY

Wallace Berry

Wallace Berry, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Total-Range Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Total-Range Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Toploader Balance Calibration

Manufacturer: OHAUS

Model No: SC6010

Serial No: BJ346242

Entech ID: TL - 3

NIST Traceble Standard Manufacturer: TROEMNER

NIST Traceble Standard Serial No. 25143, 25144, 82048

Calibration Temperature (°F):

Calibration Date: 10/26/09

Operator: JMM

Next Calibration:

Standard ID	NIST Traceable Standard (grams)	Measured Value (grams)	Difference (grams)	Percent Error (%)
1	100.0	100.0	0.0	0.0
2	200.0	200.0	0.0	0.0
3	300.0	300.0	0.0	0.0

Average Percentage Error = 0.0 %

E10

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Portable Barometer Calibration

Barometer ID: Barometer #10 (I-3)

Presample Calibration

Date:	11/12/09	
Time:	10:35 AM	
Entech Laboratory Mercury Barometer Standard (Actual)	30.04	in Hg
Portable Barometer (Actual)	30.03	in Hg
Temperature at Barometer Reading Site	83.3	°F
Portable Barometer Reading Error	0.01	in Hg
Portable Barometer Reading Acceptable? (Yes/No)	Yes	
* (Tolerance +/- 0.10 in Hg)		

I certify that I have check the portable barometer indentified above and that it agrees with the laboratory barometer standard within +/- 0.10 in Hg.

Signature

11/12/09

Date

If Unacceptable, Input Correction in Hg

Corrected Portable Barometer Reading in Hg

I certify that I have adjusted the portable barometer indentified above to the laboratory barometer standard.

Signature

Date

Postsample Calibration Check

Date:	11/23/09	
Time:	08:00 AM	
Entech Laboratory Mercury Barometer Standard (Actual)	30.15	in Hg
Portable Barometer (Actual)	30.15	in Hg
Temperature at Barometer Reading Site	73	°F
Portable Barometer Reading Error	0.00	in Hg
Portable Barometer Reading Acceptable? (Yes/No)	Yes	
* (Tolerance +/- 0.10 in Hg)		

I certify that I have check the portable barometer indentified above and that it agrees with the laboratory barometer standard within +/- 0.10 in Hg.

Signature

11/23/09

Date

E11

tutoyo

Certificate number T1D05172
page 1 of 1

CERTIFICATE OF INSPECTION

Instrument: Gauge Block

Grade: 2 (FS)

of inspection: 02nd Apr. 2001

Unit : μinch

inal gth inch	Ident. No.	Central Deviation	Maximum Deviation	Minimum Deviation	Variation
0.2	010690	0	0	-1	1

ENVIRONMENT: Air temperature (68 ± 1.8)F [(20 ± 1.0) ℃]

SIS OF TEST: FS GGG-G-15C

MATERIAL: Steel

CTION METHOD: by comparator

EFFICIENT OF L EXPANSION: (6.1±0.6)×1E-6/F [(10.9±1.0)×1E-6/K]

) UNCERTAINTY (tral Deviation) (k=2): Less than 4" 2.4 μinch (L=Nominal length) L:inch
Up to20" (1.2 + L / 2.3) μinch

ALITY SYSTEM: ISO 9002 Registered Firm : JQA JMI0189

TRACEABILTY: Traceable to NIST No.821/263174-00
(NIST=National Institute of Standard and Technology)

Date 02nd Apr. 2001

Signature QC Manager S. Shutoh

S. Shutoh

This certificate is issued by MITUTOYO MIYAZAKI PLANT:
Postal code: 889-1701
Kou10652-1 Tano-cho, Miyazaki-gun, Miyazaki-pref. Japan
Tel: 0985(86)2591 Fax: 0985(86)0827

MITUTOYO HEADQUARTERS:
Postal code: 213-0012
20-1 Sakado 1-chome, Takatsu-ku, Kawasaki-shi, Japan
Tel: 044(813)8201 Fax: 044(813)8210

Mitutoyo

Certificate number T2E06393
page 1 of 1

CERTIFICATE OF INSPECTION

Instrument: Gauge Block

Grade: 2 (FS)

Date of inspection: 13th May. 2002

Unit : μinch

Nominal Length inch	Ident. No.	Central Deviation	Maximum Deviation	Minimum Deviation	Variation
0.4	011133	+4	+4	+2	2

ENVIRONMENT: Air temperature (68 ± 1.8)F [(20 ± 1.0) ℃]

BASIS OF TEST: FS GGG-G-15C

MATERIAL: Steel

INSPECTION METHOD: by comparator

COEFFICIENT OF THERMAL EXPANSION: (6.1±0.6)×1E-6/F [(10.9±1.0)×1E-6/K]

EXPANDED UNCERTAINTY (For Central Deviation) (k=2): Less than 4" 2.4 μinch (L=Nominal length) L:inch
Up to20" (1.2 + L / 2.3) μinch

QUALITY SYSTEM: ISO 9002 Registered Firm : JQA JMI0189

TRACEABILTY: Traceable to NIST No.821/263174-00
(NIST=National Institute of Standard and Technology)

E12

Date 13th May. 2002

Signature QC Manager S. Shutoh

S. Shutoh

F-691

This certificate is issued by MITUTOYO MIYAZAKI PLANT:
Postal code: 889-1701
Kou10652-1 Tano-cho, Miyazaki-gun, Miyazaki-pref. Japan

MITUTOYO HEADQUARTERS:
Postal code: 213-0012
20-1 Sakado 1-chome, Takatsu-ku, Kawasaki-shi, Japan

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Caliper Calibration

Entech Caliper #1

02/10/09

NIST Gauge Block Size	NIST Gauge Block Iden. No. / Tracable Number	Caliper Reading
0.400	011133 (NIST No. 821/263174-00)	0.399
0.200	010690 (NIST No. 821/263174-00)	0.199

Technican Marlon Jeffery Bowen

Sign. M J Bowen

Date 02/10/09

313

APPENDIX F.

CALIBRATION GAS CERTIFICATIONS

AIR LIQUIDE Air Liquide America Specialty Gases LLC Scott

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: ALAS-44414/33645229
Project No.: 04-74415-001

Customer

ENTECH ENGINEERING INC
PO#52447
408 E MAIN
ATTN: JARAD VAWTER
LEAGUE CITY TX 77573

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: CC57866 **Certification Date:** 17Jun2009 **Exp. Date:** 17Jun2011
Cylinder Pressure*:** 1935 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	47.3	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	15Aug2009	ALM024377	50.79 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	02Jun2009	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

SULFUR DIOXIDE *

First Triad Analysis

Date: 09Jun2009 Response Unit:PPM

Z1 = 0.00240	R1 = 50.82262	T1 = 47.37937
R2 = 50.87813	Z2 = 0.01212	T2 = 47.38182
Z3 = 0.01269	T3 = 47.40593	R3 = 50.89103

Avg. Concentration: 47.32 PPM

Second Triad Analysis

Date: 17Jun2009 Response Unit: PPM

Z1 = -0.00449	R1 = 50.87268	T1 = 47.30392
R2 = 50.87285	Z2 = 0.00996	T2 = 47.31434
Z3 = 0.01586	T3 = 47.33644	R3 = 50.90194

Avg. Concentration: 47.23 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99995E-1

Constants:	A = 0.00000E+0
B = 9.94627E-1	C = 0.00000E+0
D = 0.00000E+0	E = 0.00000E+0

Special Notes: LOT# PAS00595

APPROVED BY: _____ E1
Ramien JR

234

AIR LIQUIDE Air Liquide America Specialty Gases LLC Scott

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: ALAS-44414/33645193
Project No.: 04-74414-001

Customer

ENTECH ENGINEERING INC
PO#52447
408 E MAIN
ATTN: JARAD VAWTER
LEAGUE CITY TX 77573

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: CC144163
Cylinder Pressure*:** 1848 PSIG
Certification Date: 25Jun2009
Exp. Date: 24Dec2009

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	22.2 PPM	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1693	15Aug2009	ALM024377	50.79 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	03Jun2009	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

SULFUR DIOXIDE *

First Triad Analysis

Date: 18Jun2009 Response Unit:PPM

Z1 = 0.00975	R1 = 50.85954	T1 = 22.18030
R2 = 50.87841	Z2 = 0.02603	T2 = 22.24813
Z3 = 0.03306	T3 = 22.25493	R3 = 50.91176

Avg. Concentration: 22.17 PPM

Second Triad Analysis

Date: 25Jun2009 Response Unit: PPM

Z1 = -0.00794	R1 = 50.84770	T1 = 22.31024
R2 = 50.85970	Z2 = 0.03687	T2 = 22.31388
Z3 = 0.04870	T3 = 22.33800	R3 = 50.87003

Avg. Concentration: 22.27 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99995E-1

Constants:	A = 0.00000E+0
B = 1.00387E+0	C = 0.00000E+0
D = 0.00000E+0	E = 0.00000E+0

Special Notes: LOT # PAS00615

APPROVED BY: Peter Brandon

F2

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC236179

Customer:	Entech Engineering	**Shipping Order #:**	25000332
P.O. Number:	51831	**Transfer #:**	25000332
Item Number:		**LOT #:**	LPX220346
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig
Assay Date:	3-May-07	**Expiration Date: 2-May-10**	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Propane	**50 ppm**	**52.6 ±0.7 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS281	GMIS281	49.9	ppm	0.184	C3H8	N2	CC28041	5/3/2008	N.A.

Analysis Information:

Component 1: Propane

Analyzer Information	
Manufacturer:	HP
Model Number:	6890
Serial Number:	8295
Analytical Principle:	GC-FID
MPC Calibrated:	04/05/07

	First Triad Analysis On: 5/3/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.00	0.00	
Reference	47.99	47.96	47.93	
Candidate	50.34	50.78	50.63	
Result	52.37	52.84	52.68	ppm
Mean Result:			52.63	ppm

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
Mean Result:				

Analyst Signature: Warren Pereira **Calculated by:** Warren Pereira

E3

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC161053

Customer:	Entech Engineering	**Shipping Order #:**	25000357
P.O. Number:	51831	**Transfer #:**	25000357
Item Number:		**LOT #:**	LPX220344
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig

Assay Date: 3-May-07 **Expiration Date: 2-May-10**

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Propane	**30 ppm**	**31.0 ±0.5 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS281	GMIS281	49.9	ppm	0.184	C3H8	N2	CC28041	5/3/2008	N.A.

Analysis Information:

Component 1:	Propane
Analyzer Information	
Manufacturer:	HP
Model Number:	6890
Serial Number:	8295
Analytical Principle:	GC-FID
MPC Calibrated:	04/05/07

	First Triad Analysis On:		5/3/2007	
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.00	0.00	
Reference	47.99	47.96	47.93	
Candidate	29.79	29.77	29.84	
Result	31.00	30.98	31.05	ppm
		Mean Result:	31.01	ppm

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

Analyst Signature: _____ Warren Pereira **Calculated by:** _____ Warren Pereira

F4

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE Air Liquide America Specialty Gases LLC

SCOTT™

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

11426 FAIRMONT PKWY, LA PORTE, TX 77571 Phone: 800-248-1427 Fax: 281-474-8419

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
11426 FAIRMONT PKWY
LA PORTE, TX 77571

P.O. No.: 52579
Project No.: 04-78124-001

Customer

ENTECH ENGINEERING, INC
TERRY HUDY
PO# 52579
408 E MAIN
LEAGUE CITY TX 77573

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: CC151954
Cylinder Pressure*:** 1500 PSIG
Certification Date: 03Nov2009
Exp. Date: 02Nov2014
Batch No: LAP0003953

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
PROPANE	88.4	PPM	+/- 2%	NIST and VSL
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1668	02Oct2012	ALM020070	98.80 PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HP-Y/HP 6890/US00000974	16Oct2009	GAS CHROMATOGRAPHY

Special Notes: CERTS AND TAGS: ENTECH ENGINEERING
PO# 52579 ATTN: TERRY HUDY

APPROVED BY: ROGER NGUYEN

F5

AIR LIQUIDE™

RECERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: EB0008543

Customer: ENTECH ENGINEERING, INC.
Location: LA PORTE, TX

P.O. Number: 52251

Shipping Order Number: 30709722
Transfer Number: 30709716
Lot Number: SFS124927
Valve: CGA 660
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 4-Sep-2008 **Expiration Date: 4-Sep-2010**

Components	Requested Concentration	Assay Concentration
Air	Balance	Balance
Nitrogen Dioxide	50 ppm	50.0 ± 1.2 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty				Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
51.4	±	1.2	ppm	Nitrogen Dioxide	Nitrogen	EB0009973	SFS119543	12-Jul-2010	BI	GMIS

Analytical Data

Component:	Nitrogen Dioxide		FIRST TRIAD ANALYSIS 26-Feb-2008				SECOND TRIAD ANALYSIS 4-Sep-2008			
Analyzer Information							Trial 1	Trial 2	Trial 3	Units
Analyzer Type:	Fourier Transform IR					Zero	0.032	0.055	0.041	ppm
Manufacturer:	MKS Instruments		INITIAL			Reference	51.323	51.299	51.384	ppm
Model Number:	2031		ASSAY			Candidate	50.064	49.935	49.931	ppm
Serial Number:	10387278					Result	50.14	50.03	49.95	ppm
MPR Last Calibrated:	4-Sep-2008	Evaluation	Valid	Valid	Valid	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FTIR	Mean Analytical Result:		50.00	ppm	Mean Analytical Result:			50.04	ppm

Analyst: _____ Tan Ngo

Approved by: _____ Thuan Tran

F6

AIR LIQUIDE AMERICA, L.P. 8832 Dice Road, Santa Fe Springs, CA 90670-2516
Phone: (562) 945-1383 • Fax: (562) 693-1156

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC61285

Customer:	Entech	**Shipping Order #:**	31397140
P.O. Number:	52300	**Transfer #:**	31397140
Item Number:		**LOT #:**	LPX245265
Notes:		**Valve**	CGA660
File Name:	313971401B	**Cyl. Pressure:***	1900psig
Assay Date:	30-Nov-08	**Expiration Date: 30-Nov-10**	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Nitric Oxide	52.5 ppm	53.3 ±0.7 ppm
Total NOX		53.7 ppm
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS426	GMIS426	50.57	ppm	0.48	NO	N2	CC217252	6/26/2010	N.A.

Analysis Information:

Component 1:	Nitric Oxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	11/13/08

	First Triad Analysis On:		11/20/2008	
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.50	0.41	-0.08	
Reference	51.66	50.61	50.89	
Candidate	53.62	52.83	53.81	
Result	53.11	52.33	53.30	ppm
		Mean Result:	52.91	ppm

	Second Triad Analysis On:		11/30/2008	
	Trial 1	Trial 2	Trial 3	Units
Zero	0.32	0.15	-0.12	
Reference	50.59	51.30	50.71	
Candidate	53.93	54.02	54.20	
Result	53.63	53.71	53.89	ppm
		Mean Result:	53.74	ppm

Analyst Signature: _____ Ron Stitt

Calculated by: _____ Ron Stitt

F7

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC241846

Customer:	Entech	**Shipping Order #:**	31397421
P.O. Number:	52300	**Transfer #:**	31397421
Item Number:		**LOT #:**	LPX245227
Notes:		**Valve**	CGA660
File Name:	313974211A	**Cyl. Pressure:***	1900psig
Assay Date:	30-Nov-08	**Expiration Date: 30-Nov-10**	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Nitric Oxide	22 ppm	24.3 ±0.4 ppm
Total NOX		24.6 ppm
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS426	GMIS426	50.57	ppm	0.48	NO	N2	CC217252	6/26/2010	N.A.

Analysis Information:

Component 1:	Nitric Oxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	11/13/08

	First Triad Analysis On:		11/20/2008	
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.50	0.41	-0.08	
Reference	51.66	50.61	50.89	
Candidate	24.07	23.78	23.93	
Result	23.87	23.59	23.73	ppm
		Mean Result:	23.73	ppm

	Second Triad Analysis On:		11/30/2008	
	Trial 1	Trial 2	Trial 3	Units
Zero	0.32	0.15	-0.12	
Reference	50.59	51.30	50.71	
Candidate	25.72	24.59	24.92	
Result	25.52	24.39	24.71	ppm
		Mean Result:	24.87	ppm

Analyst Signature: _____ Ron Stitt

Calculated by: _____ Ron Stitt

F8

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC111686

Customer:	ENTECH ENGINEERING	**Shipping Order #:**	23921644
P.O. Number:	51721	**Transfer #:**	23921644
Item Number:		**LOT #:**	LPX215846
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig
Assay Date:	1-Feb-07	**Expiration Date: 31-Jan-10**	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Carbon Monoxide	**300 ppm**	**297 ±2 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS339	GMIS339	99.44	ppm	0.48	CO	N2	CC82421	11/14/2008	N.A.

Analysis Information:

Component 1:	Carbon Monoxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	01/18/07

	First Triad Analysis On:		1/24/2007	
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.39	0.10	-0.14	
Reference	92.40	92.32	92.55	
Candidate	276.06	275.47	275.87	
Result	296.72	296.08	296.52	ppm
		Mean Result:	296.44	ppm

	Second Triad Analysis On:		2/1/2007	
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.28	0.08	0.04	
Reference	93.91	94.49	93.92	
Candidate	282.27	283.37	282.12	
Result	298.16	299.32	298.00	ppm
		Mean Result:	298.49	ppm

Analyst Signature: Bryan Leger **Calculated by:** M. Adnane

F9

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE Air Liquide America Specialty Gases LLC | Scott™

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: ALAS-44414/33518189
Project No.: 04-74021-001

Customer

ENTECH ENGINEERING
PO#52438
ATTN: TERRY HUDY
408 E MAIN
LEAGUE CITY TX

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM014290 **Certification Date:** 04Jun2009 **Exp. Date:** 04Jun2012
Cylinder Pressure*:** 1917 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	132	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2636	02Oct2011	KAL003907	240.8 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929060	30May2009	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

CARBON MONOXIDE

First Triad Analysis

Date: 28May2009 Response Unit:PPM

Z1 = -0.09635	R1 = 240.6386	T1 = 131.4899
R2 = 240.7436	Z2 = 0.14992	T2 = 131.5533
Z3 = 0.20132	T3 = 131.6579	R3 = 240.8057

Avg. Concentration: 131.6 PPM

Second Triad Analysis

Date: 04Jun2009 Response Unit: PPM

Z1 = -0.05429	R1 = 240.4354	T1 = 131.5436
R2 = 240.7585	Z2 = 0.17570	T2 = 131.5554
Z3 = 0.25626	T3 = 131.5985	R3 = 240.8407

Avg. Concentration: 131.6 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99999E-1

Constants:	A = 0.00000E+0
B = 5.08875E-1	C = 1.87000E-4
D = 0.00000E+0	E = 0.00000E+0

Special Notes: CERTS AND TAGS: LOT# PAS00481 ENTECH ENGINEERING PO#52438 ATTN: TERRY HUDY

APPROVED BY: _____ F10
Ramien JR

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC55212

Customer: ENTECH
P.O. Number: 52300
Item Number:
Notes:

Shipping Order #: 31397843
Transfer #: 31397843
LOT #: LPX245230
Valve CGA590
Cyl. Pressure:* 1900psig
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 24-Nov-08 **Expiration Date: 24-Nov-11**

Component	Requested Concentration	Assay Concentration
Oxygen	9.5 %	9.49 ±0.10 %
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS413	GMIS413	10.0	%	0.1	O2	N2	CC204761	2/21/2010	N.A.

Analysis Information:

Component 1: Oxygen

Analyzer Information	
Manufacturer:	Servomex
Model Number:	4605C
Serial Number:	1101
Analytical Principle:	Paramag.
MPC Calibrated:	11/17/08

	First Triad Analysis On: 11/24/2008			
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.01	0.00	
Reference	9.87	9.89	9.89	
Candidate	9.38	9.39	9.38	
Result	9.49	9.50	9.49	%
		Mean Result:	9.49	%

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

Analyst Signature: _____ Debra Jackson

Calculated by: _____ Debra Jackson

F11

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC9824

Customer:	ENTECH	**Shipping Order #:**	31397611
P.O. Number:	52300	**Transfer #:**	31397611
Item Number:		**LOT #:**	LPX245229
Notes:		**Valve**	CGA580
		Cyl. Pressure:*	1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 24-Nov-08 **Expiration Date: 24-Nov-11**

Component	Requested Concentration	Assay Concentration
Oxygen	**5 %**	**4.94 ±0.05 %**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS413	GMIS413	10.0	%	0.1	O2	N2	CC204761	2/21/2010	N.A.

Analysis Information:

Component 1: Oxygen

Analyzer Information	
Manufacturer:	Servomex
Model Number:	4605C
Serial Number:	1101
Analytical Principle:	Paramag.
MPC Calibrated:	11/17/08

	First Triad Analysis On: 11/24/2008			
	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.01	0.00	
Reference	9.87	9.89	9.89	
Candidate	4.88	4.88	4.88	
Result	4.94	4.94	4.94	%
		Mean Result:	4.94	%

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

Analyst Signature: Warren Pereira **Calculated by:** Warren Pereira

F12

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

APPENDIX G.

PROCESS DATA

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

PROCESS DATA

Process data concerning the Unit 39.1 Tail Gas Incinerator initial demonstration of compliance test will be provided buy ConocoPhillips Company.

APPENDIX H.

RESUMES

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

Steven L. Yin

2002-present	*Laboratory Manager* Entech Engineering Inc. - Laboratory Analysis - Instrument maintenance - Method development - Analytical QA/QC assurance
1990-2002	*Supervisor/Senior Environmental Chemist* Pace Analytical Services, Inc.
1998-1990	*Technical Support Chemist* Analytical Sensors, Inc.
1985-1998	*M.S. Chemist* Texas Southern University Houston, Texas
1978-1982	*B.S. Material Science* Shanghai University of Science and Technology Shanghai, China

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

Michael Brocato

2008-present	Entech Engineering Inc. *Environmental Scientist II*
2006-2007	Dexter Field Services, Inc. *Project Manager* -Region 1 & 2 Cooling Towers -BWON Compliance Sampling - Assist with LDAR stream speciation
2001-2006	Lamar University Beaumont,TX B.S. Biology *-minor in Chemistry*

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

Gustavo Vargas

2009- Present	Senior Environmental Specialist Entech Engineering, Inc. – Source Compliance Testing - Emission Abatement - CEMS Certification - Laboratory Analysis
2004-2009	Environmental Field Supervisor Golden Specialty Consulting, Ltd. – Source Compliance Testing - Emission Abatement - CEMS Certification - Laboratory Analysis
2001-2004	Environmental Field Technician Airtech Environmental Services -Source Compliance Testing - Emission Abatement - CEMS Certification - Laboratory Analysis
1994-1999	Law Degree U.A.N.L. Monterrey, Mexico

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

Mark A Lester

2002-present	*Principal Environmental Technician* Entech Engineering Inc. - Source Compliance Testing - Equipment calibration and maintenance - Source Compliance Testing - Emissions Abatement - CEMS Certification - Laboratory Analysis
1983-2001	*Senior Environmental Tech.- Field Supervisor* Tetra tech NUS formally Haliburton NUS - Source Compliance Testing - Emissions Abatement - CEMS Certification - Laboratory Analysis - Fugitive emission sampling - Ambient air sampling - Under ground storage tank removal - Soil Analysis - Soil remediation - Heavy equipment operator - Ground water sampling - Ground water remediation - Ground water analysis - Hazardous waste clean up (Super Fund Sites)
1978-1983	*Environmental Technician* Energy Impact Associates - Ambient air sampling - Meteorological equipment set-up and calibration - Ambient air station maintenance and calibration

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

RESUMES

Joseph Muir

2007-Present	*Senior Environmental Scientist* Entech Engineering Inc. -Source Compliance Testing -Equipment Calibration and Maintenance
2006-2007	*Order Filler* UTI -Distribute items to various regions -Process trailers for loading and logistical transactions -Heavy equipment cerification
2002-2006	*Contract worker and entertainment specialist* Staff Mart/Target -Loading and processing cargo -Supervised and monitored subordinate employees
2000-2005	*B.S. Wildlife and Fisheries Science* Texas A&M University College Station, Texas

APPENDIX I.

CHAIN OF CUSTODY

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

CHAIN OF CUSTODY

Mr. Joseph Muir, Senior Environmental Scientist of Entech Engineering Inc., was in charge of obtaining the emission samples and/or data and transporting them from ConocoPhillips Company's Sweeny Refinery in Old Ocean, Texas to Entech Engineering Inc. in League City, Texas. The emission samples and/or data were delivered to and analyzed at the Entech Engineering office in League City, Texas.

ENTECH ENGINEERING INC.

P. O. Box 890748 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: ConocoPhillips

Plant Name: Sweeny Refinery

Unit/EPN: Unit 39.1 CEPN 39.1-95-1187

Company Address: HWY 35 & FM 524

City: Old Ocean | State: Tx | Zip: 77480

Entech Proposal No.: EP2009-06-39

Entech Supervisor Name: Ed Pasternak

Entech Supervisor Signature:

Remarks:

Turnaround Time:

Detection Limits Required (Yes) No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Container Info. Number of Containers	Container Info. Preservatives	Analysis Parameters: Orsat	Analysis Parameters: Methane / Ethane
ES09-11-20851	Stack T2	C	11/18	1115	G	1	—	X	X
ES09-11-20852	Stack T3	C	11/18	1515	G	1	—	X	X

T2

Person Taking Sample (a.-Print Name & b.-Signature)	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
See above for date and time a. Joseph Muir b.					Y	Y	Y	none

Received By (Signature)	Date:	Time:	QAQC LAB acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
Katie Mc	Nov 19/2009	1233 Pm	Yes				none

Sample Remainder Disposal

I Requested Lab To Dispose Of All Sample Remainders

Return Sample remainder to Entech Via:

(Signature) (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

f\templates\datasheets\field\chain of custody datasheets\chain of custody sheet.rev6 QAQC BACKUP.qpw 08/06

COC Lab Doc Number 805 | COC unfilled form controlled document number: COCRev6c

Original ORIGINAL

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: Conoco Phillips

Plant Name:

Unit/EPN: 39.1

Company Address:

City: Old Ocean | State: Tx | Zip:

Entech Proposal No.:

Entech Supervisor Name: Ed Pasternak

Entech Supervisor Signature:

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Container Info. Number of Containers	Container Info. Preservatives	Analysis Parameters: Orsat	Analysis Parameters: Methane/Ethane	Remarks:
E409-11-20832	Stack T1	C	11/17/09	1510	G	1	—	X	X	GC#1

Turnaround Time:

Detection Limits Required (Yes) No

Circle one, if Yes, describe below or include separate sheet detailing requirements.

Person Taking Sample (a.-Print Name & b.-Signature)	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
See above for date and time a. Joseph Myer b.					Y	Y	Y	none
Received By (Signature):	**Date:**	**Time:**	**QAQC LAB acceptance checks. Place a Y or N after text**		**Container Type and volume OK?**	**Holding time OK?**	**Temperature OK?**	**Sample deficiencies - list on reverse. If none, write "none" in this box.**
	11-18-09	630	4		✓	✓	✓	none

Sample Remainder Disposal

Return Sample remainder to Entech Via:

I Requested Lab To Dispose Of All Sample Remainders

(Signature) (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

COC Lab Doc Number 803 | COC unfilled form controlled document number: COCRev6c

original ORIGINAL

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: Conoco Phillips
Plant Name: Sweeny Refinery
Unit/EPN: Unit 39.1 CEPN 39.1-95-114)
Company Address: HWY 35 & FM 524
City: Old Ocean | State: Tx | Zip: 77480

Entech Proposal No.: EP2009-06-39

Entech Supervisor Name: Ed Pasternak
Entech Supervisor Signature:

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Container Info. Number of Containers	Container Info. Preservatives	Analysis Parameters: Particulate Matters	Remarks:
ES09-11-20853	Test 1 FH wash	G	11/17	1510	L	1	—	X	
20854	Test 1 Filter 1127	C	11/17	1510	S	1	—	X	
20855	Test 1 Impinger 1	C	11/17	1510	L	1	—	X	
20856	Test 2 FH wash	G	11/14	1115	L	1	—	X	
20857	Test 2 Filter 1110	C	11/14	1115	S	1	—	X	
20858	Test 2 Impinger 1	C	11/14	1115	L	1	—	X	
20859	Test 3 FH wash	G	11/18	1515	L	1	—	X	
20860	Test 3 Filter 1144	C	11/18	1515	S	1	—	X	
20861	Test 3 Impinger 1	C	11/18	1515	L	1	—	X	

Turnaround Time:

Detection Limits Required
Yes No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Person Taking Sample (a.-Print Name & b.-Signature) See above for date and time	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
a. Michael Bracato b.					Y	Y	Y	none
Received By (Signature):	Date: 11/18/09	Time: 1630	QAQC LAB acceptance checks. Place a Y or N after text		Container Type and volume OK? Y	Holding time OK? Y	Temperature OK? Y	Sample deficiencies - list on reverse. If none, write "none" in this box. none

Sample Remainder Disposal
I Requested Lab To Dispose Of All Sample Remainders
Return Sample remainder to Entech Via:
(Signature) (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

Original ORIGINAL

APPENDIX J.

PERSONNEL INFORMATION

PERSONNEL INFORMATION

The ConocoPhillips Company contact for additional information is Mr. Sean O'Brien. The testing organization is Entech Engineering Inc. and the contacts at Entech Engineering are Mr. Billy T.Y. Lee and Mr. Edward J. Pasternak. The names and addresses of these contacts are as follows:

Mr. Sean O'Brien
Environmental Department
ConocoPhillips Company
Sweeny Refinery
Old Ocean, Texas 77463
P.O. Box 866
Sweeny, Texas 77480
(979) 491-2705

Mr. Billy T.Y. Lee, P.E.
President
Entech Engineering Inc.
408 E. Main
League City, Texas 77573
(281) 332-3118

Mr. Edward J. Pasternak
Technical Manager
Entech Engineering Inc.
408 E. Main
League City, Texas 77573
(281) 332-3118