Georgia Department of Natural Resources

Environmental Protection Division · Air Protection Branch
4244 International Parkway · Suite 120 · Atlanta · Georgia 30354
Telephone: 404/363-7000 · Fax: 404/363-7100
Judson H. Turner, Director

FEB 17 2015

MEMORANDUM:

TO: Sean Taylor
THROUGH: Ross Winne, Richard Taylor
FROM: Anna Gray
SUBJECT: SOURCE TEST REPORT REVIEW

The following test has been reviewed and was conducted in an acceptable fashion for the purpose intended.

COMPANY NAME	Sterigenics U.S. LLC
COMPANY LOCATION	Smyrna, GA
SOURCE TESTED	Areation Room/Advanced Air Technologies (AAT) emission control system
POLLUTANT DETERMINED	Ethylene Oxide
REPORT REVIEWED BY	Anna Gray
TEST WITNESSED BY	Anna Gray
DATE(S) OF TEST	October 23, 2014 to October 24, 2014
DATE RECEIVED BY APB	January 8, 2015
APPLICABLE REGULATION	Permit No. 7389-067-0093-S-05-0, Conditions 2.3, 6.2 and 6.3
MEMORANDUM	The reduction efficiency test of the Two stage Advanced Air Technologies (AAT) emission control system, which controls the emissions from the aeration room, was conducted in accordance o USEPA CFR 40, Part 63.365. The emissions reduction should be at least 99%. Average EtO concentration on inlet= 27.94 ppm Average EtO concentration on outlett= 0.0122 ppm Average EtO Control Efficiency: 99.95% Aeration time on each run: 60 min Average flow on the outlet: 9831 dscfm EtO average mass flow on the outlet: 0.000824 lbs/hr The inlet flow was assumed the same as the outlet. Each test run was performed with freshly sterilized product in the aeration chambers. Parameters during test: Scrubber flow rate= 1537 gpm; 0.9 pH; Storage tank level for the scrubber: 108"; Glycol concentration=30.4%

cc: Ross Winne
Reference Number: 201500164

AIRS Number: 06700093
Printed: 2/17/2015

FEB 17 2015

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Telephone: 404/363-7000 · Fax: 404/363-7100
Judson H. Turner, Director

MEMORANDUM:

TO: Sean Taylor
THROUGH: Ross Winne, Richard Taylor
FROM: Anna Gray
SUBJECT: SOURCE TEST REPORT REVIEW

The following test has been reviewed and was conducted in an acceptable fashion for the purpose intended.

COMPANY NAME	Sterigenics U.S. LLC
COMPANY LOCATION	Smyrna, GA
SOURCE TESTED	10-Sterilizer Chambers/Ceilcote Scrubber
POLLUTANT DETERMINED	Ethylene Oxide
REPORT REVIEWED BY	Anna Gray
TEST WITNESSED BY	Anna Gray
DATE(S) OF TEST	October 23, 2014
DATE RECEIVED BY APB	January 8, 2015
APPLICABLE REGULATION	Permit No. 7389-067-0093-S-05-0, Conditions 2.3, 6.2 and 6.3
MAXIMUM EXPECTED OPERATING CAPACITY	12,000 ACFM
OPERATING CAPACITY	N/A
ALLOWABLE EMISSION RATE	99 % DRE
CONTROL EQUIPMENT AND MONITORING DATA	Scrubber flow rate= 155 gpm; 1.7 pH; Storage tank level for the scrubber: 185"; Glycol concentration=35.7%

cc: Ross Winne
Reference Number: 201500030

AIRS Number: 06700093
Printed: 2/17/2015

Georgia Department of Natural Resources

Environmental Protection Division · Air Protection Branch
4244 International Parkway · Suite 120 · Atlanta · Georgia 30354
Telephone: 404/363-7000 · Fax: 404/363-7100
Judson H. Turner, Director

MEMORANDUM

The reduction efficiency test of the Ceilcote packed tower scrubber emission control system was conducted in accordance o USEPA CFR 40, Part 63.365. At least one of the test runs was performed using emissions from the new 30-pallet sterilizer.

Run #1 Inlet EtO= 27.4 lbs
Outlet EtO= 0.0010212 lbs
EtO Control Efficiency= 99.996%
Minutes/cycle= 22

Run #2 Inlet EtO=61.0 lbs
Outlet EtO= 0.0041159 lbs
EtO Control Efficiency= 99.993%
Minutes/cycle= 23

Run #3 Inlet EtO= 218.1 lbs
Outlet EtO= 0.0189873 lbs
EtO Control Efficiency= 99.991%
Minutes/cycle= 27
Average EtO Control Efficiency: 99.993%

The amount of ethylene oxide used during each sterilization cycle was calculated by the Gas law and the conditions at the beginning and the end of every exhaust phase. All exhaust phase testing wsa conducted during normal process load conditions, but with an empty sterilization chamber to facilitate inlet mass calculation and the performance of multiple test runs.

TEST REPORT TRANSMISSION SUMMARY
(Submit separate summary sheet for each pollutant test report)

Submit to:
Ross Winne, Program Manager
Industrial Source Monitoring Program
4244 International Parkway, Suite 120
Atlanta, GA 30354

RECEIVED
JAN 29 2015
ISMP

ISMP Database
(Air Protection Branch use only)
No. 2015 00164

Facility Name: ~~Sterigenics U.S. LLC~~

Facility Address: 2973 Olympic Industrial Blvd., Smyrna, Georgia 30080
(Address / City / Zip)

Facility Contact: Daryl Mosby – General Manager Phone No. 404.355.4485

PART A

Emission Point (one only): AAT Emission Control System

Pollutant (one only): ~~Ethylene Oxide~~ Date test performed: 24 Oct.14

Applicable Rule(s), Regulation(s) or Permit Conditions (Indicate Permit # and Condition #'s): NESHAP regulation for AAT Safe Cell, Permit # 7389-067-0093-S-05-0, Requirements 6.2 and 6.3

Maximum expected operating capacity: 12,000 cfm

Operating capacity during test: ~~99.96%~~

Computed allowable emission rate(s) or limitation(s): ≥ 99% or ≤ 1 ppm
(Determined for each applicable rule, regulation or permit condition using same units)

Reported emissions to atmosphere: 5.03 pounds (2013)
(In same units as rule, regulation or permit condition)

The test report should include a compilation of all CEMS data, control devise parameters and process operating data related to the test.

PART B

For any facility operating under a Part 70 Permit, Condition 8.8.3 of that permit requires the following certification should be signed by a responsible official and included with the report:

I certify that based on my information and belief formed after reasonable inquiry, the statements and information in this report are true, accurate, and complete.

NAME	SIGNATURE	TITLE	DATE
Kathleen Hoffman	KA Hoffman	SVP - Global EHS	23 - Jan-2015

REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN SMYRNA, GEORGIA
ON OCTOBER 24, 2014

#2015CC0104

Submitted to:

GEORGIA DEPARTMENT OF NATURAL RESOURCES
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Submitted by:

STERIGENICS U.S., LLC.
2973 Olympic Industrial Boulevard
Smyrna, Georgia 30080-7322

GDNR Permit Number 7839-067-0093-S-05-0

Prepared by:

ECSI, INC.
PO Box 848
San Clemente, California 92674-0848

December 7, 2014

ECSi

CONTACT SUMMARY

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FACILITY

Mr. Daryl Mosby
General Manager
STERIGENICS U.S., LLC.
2973 Olympic Industrial Boulevard
Smyrna, Georgia 30080

Phone: (404)355-4485
FAX: (404)355-4852
Email: dmosby@sterigenics.com

TEST DATE

October 24, 2014

REGULATORY AGENCY

Mr. Don Holder
Principal Environmental Engineer
Stationary Source Compliance Program
GEORGIA DEPARTMENT OF NATURAL RESOURCES
Environmental Protection Division, Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Phone: (404)363-7000
FAX: (404)363-7100
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TESTING CONTRACTOR

Daniel P. Kremer
Project Manager
ECSi, Inc.
PO Box 848
San Clemente, California 92674-0848

Phone: (949)400-9145
FAX: (949)281-2169
email: dankremer@ecsi1.com

TABLE OF CONTENTS

ECSi

LIST OF TABLES

ECSi

LIST OF APPENDICES

ECSi

1.0 INTRODUCTION

On Friday, October 24, 2014, ECSi, Inc. performed air pollution source testing of an ethylene oxide (EtO) emission-control device operated by Sterigenics, Inc. in Smyrna, Georgia. The control device tested was a two-stage Advanced Air Technologies Safe Cell emission-control system, which is currently used to control emissions from one aeration room. The purpose of the testing program was to demonstrate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics by the Georgia Department of Natural Resources, Environmental Protection Division (GDNR).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of nine commercial sterilizers, which are discharged through liquid-ring vacuum pumps to a Ceilcote packed tower scrubber emission-control system, nine sterilizer exhaust vents (backvents), which are currently discharged to atmosphere, and one aeration room, which is discharged to a two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system. As an alternative emission-control scenario, the facility also has the capability to discharge the sterilization chamber vacuum pumps to the AAT Safe Cell system. The gas-sterilization and emission-control equipment consist of the following:

- Nine Gas Sterilizers, two 5-pallet, two 6-pallet, four 13-pallet, and one new 30-pallet capacity, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a backdraft valve, and a fugitive emissions exhaust hood;

- One aeration room (AR-1), 152,400 cubic feet capacity, comprised of a heated aeration chamber and a chamber exhaust system.

Sterilizer vacuum pump emissions are be controlled by:

- One Ceilcote packed tower chemical scrubber, equipped with: a reaction/interface column, 27' 4" high, 42" in diameter, with a 20' bed of #1 Tellerette packing; a 115 GPM scrubber fluid recirculation system; and two 28,000 gallon reaction/storage tanks.

Sterilizer aeration emissions are controlled by:

- One two-stage Advanced Air Technologies Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1), equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank, and a dry bed reactor/scrubber (SC2), comprised of a bank of solid-bed reaction vessels, connected in parallel, installed downstream of SC1 and upstream of a dedicated blower exhaust system.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the AAT Safe Cell System during a one-hour interval of the 24-hour aeration process. A total of three test runs were performed.

During aeration testing, EtO emissions at the inlet and the outlet of the AAT Safe Cell System were determined using direct source sample injection into the gas chromatograph (GC). All aeration testing was performed using freshly sterilized product. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics was tested to demonstrate compliance with the EPA requirements, as specified in the GDNR Air Quality Permit. The following requirements must be met:

- The emissions from the aeration process must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight.

Testing is required to demonstrate compliance with these requirements. Source testing of the AAT Safe Cell System is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the AAT Safe Cell System during a one-hour interval of the 24-hour aeration process. A total of three test runs were performed.

During aeration testing, EtO emissions at the inlet and the outlet of the AAT Safe Cell System were determined using direct source sample injection into the gas chromatograph (GC). All aeration testing was performed using freshly sterilized product. The testing program was conducted in accordance with the procedures outlined in the following sections.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded. This parametric monitoring data is attached as Appendix G.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the scrubber was determined by 40 CFR 60, Appendix A, Method 2, using an s-type pitot tube and an inclined-oil manometer. Sampling ports were located in accordance with 40 CFR 60, Appendix A, Method 1. The test ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible and, based on previous test data, a value of 2 percent was used for flow calculations.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During the aeration process, EtO emissions at the inlet and outlet of the AAT Safe Cell System were determined using direct source sample injection into the GC. The mass of EtO emitted from the outlet was determined using Equation 2, shown below in Section 5.9. Mass-mass control-efficiency of EtO during the aeration process was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During aeration, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO emissions, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the emission-control system outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet of the Safe Cell System, the sampling port was located in the plenum immediately upstream packed tower scrubber. At the outlet of the Safe Cell System, sampling ports were located in the exhaust stack downstream of the dry bed reactors.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five-minute intervals during aeration testing. Helium was the carrier gas for both the FID and the PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 80 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.7 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix F.

5.8 SAMPLING DURATION

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing consisted of three 1-hour test runs. Each test run was performed with freshly sterilized product in the aeration chambers.

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5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

Mass emissions of EtO during aeration were calculated using the following equation:

$$MassRate = (VolFlow)(MolWt)(ppmv\ EtO/10^6)/(MolVol)$$

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Results of the control-efficiency testing are presented in Section 8.0 and in Table 1.

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6.0 TEST SCENARIO

The aeration testing was performed during normal process load conditions. Three aeration test runs were conducted in series to verify the performance of the emission-control system. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Aeration Phase Test Run #1 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the Safe Cell System.
3) Aeration Phase Test Run #2 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the Safe Cell System.
4) Aeration Phase Test Run #3 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the Safe Cell System.
5) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix F.

8.0 TEST RESULTS

The AAT Safe Cell System demonstrated an EtO control efficiency of 99.96 percent. In accordance with EPA requirements, as specified in the GDNR Air Quality Permit, this control equipment must have an EtO control efficiency of 99 percent or more in control of emissions from the aeration process. The AAT Safe Cell System met this requirement.

The test results are summarized in Table 1. This table includes results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through D. Copies of field data and calculation worksheets are attached as Appendix E.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN SMYRNA, GEORGIA ON OCTOBER 24, 2014

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	942	25.9	0.02	99.9228
1	947	26.5	0.01	99.9623
1	952	24.8	0.03	99.8790
1	957	25.8	0.01	99.9612
1	1002	25.9	0.03	99.8842
1	1007	24.9	0.01	99.9598
1	1012	25.2	0.04	99.8413
1	1017	25.2	0.01	99.9603
1	1022	25.3	0.01	99.9605
1	1027	25.3	0.01	99.9605
1	1032	25.4	0.01	99.9606
1	1037	26.6	0.01	99.9624
2(4)	1042	25.8	0.01	99.9612
2	1047	25.1	0.01	99.9602
2	1052	26.4	0.01	99.9621
2	1057	26.2	0.01	99.9618
2	1102	26.3	0.01	99.9620
2	1107	25.7	0.01	99.9611
2	1112	24.5	0.01	99.9592
2	1117	26.9	0.01	99.9628
2	1122	27.6	0.01	99.9638
2	1127	28.9	0.01	99.9654
2	1132	29.0	0.01	99.9655
2	1137	28.3	0.01	99.9647
3(5)	1142	29.6	0.01	99.9662
3	1147	30.1	0.01	99.9668
3	1152	29.7	0.01	99.9663
3	1157	30.6	0.01	99.9673
3	1202	31.1	0.01	99.9678
3	1207	31.0	0.01	99.9677
3	1212	30.9	0.01	99.9676
3	1217	32.9	0.01	99.9696
3	1222	31.7	0.01	99.9685
3	1227	33.2	0.01	99.9699
3	1232	33.1	0.01	99.9698
3	1237	34.5	0.01	99.9710
TIME-WEIGHTED AVERAGE:		**27.94**	**0.0122**	**99.9551**
		GDNR REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 9:40, ended at 10:40.
(4) - Aeration Phase Test Run #2 started at 10:40, ended at 11:40.
(5) - Aeration Phase Test Run #3 started at 11:40, ended at 12:40.

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APPENDICES

APPENDIX A

Calibration Data

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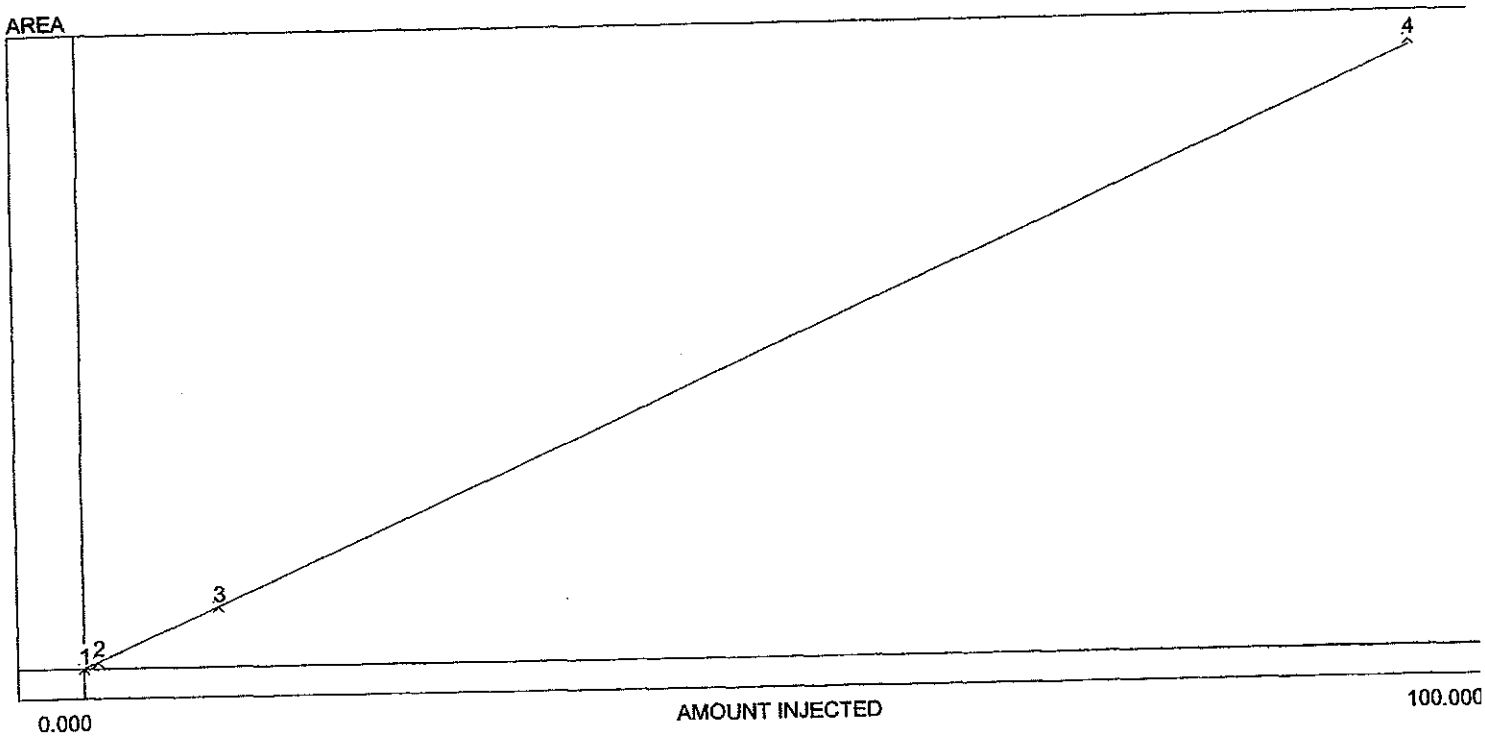
ık	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\1Ster	0.00014	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

ibration file: C:\peak359\1SterGA2014.cal

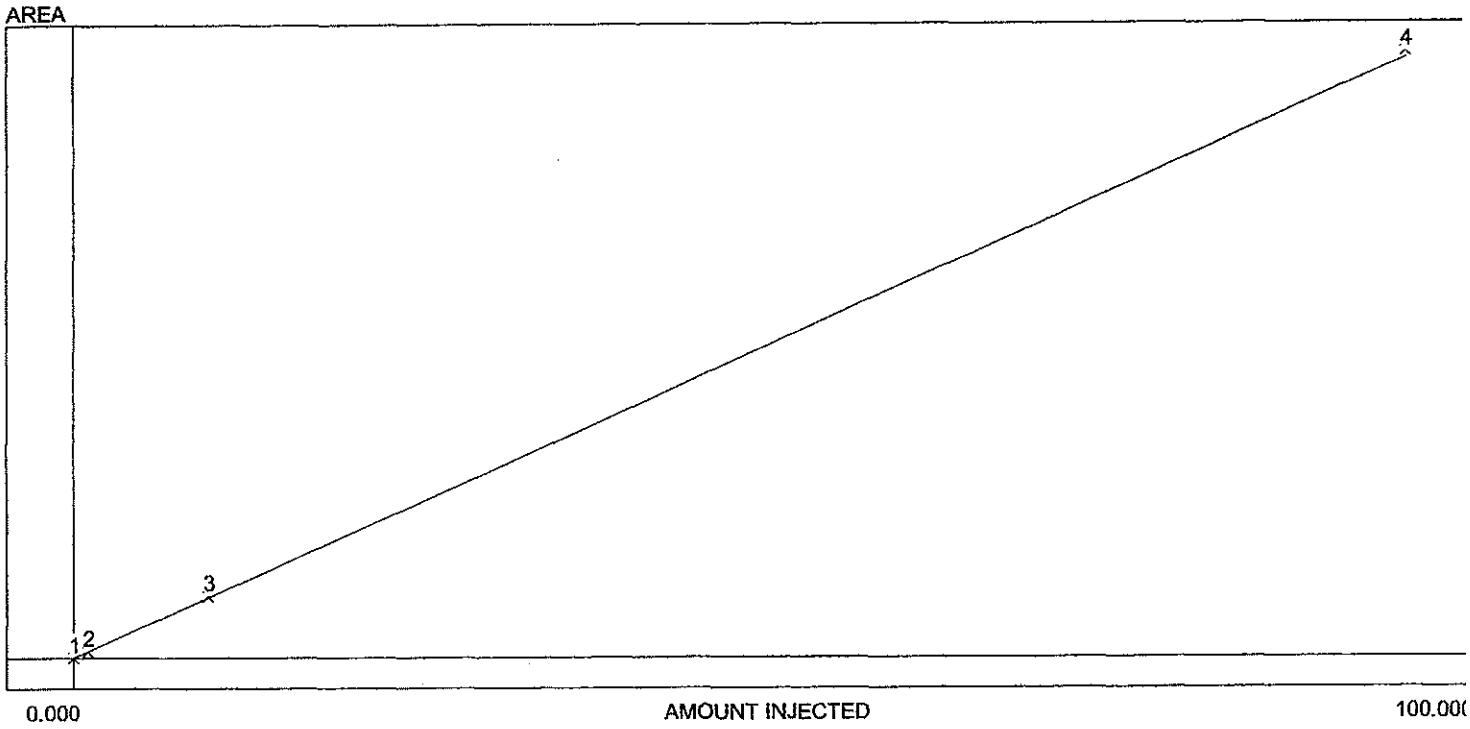


slope of curve: 0.37
is intercept: 0.00
arity: 1.00
ıber of levels: 4
rel SD of CF's: 0.2/66.7
.3715X
0
rated: Thu Oct 23 12:52:16 2014

Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
0.405	1.100	0.368	0.405	N/A	N/A
3.750	10.100	0.371	3.750	N/A	N/A
37.500	100.000	0.375	37.500	N/A	N/A

k	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\2Ster	0.00014	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

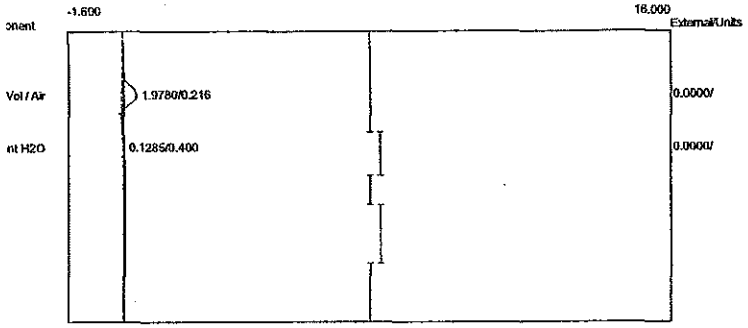
ibration file: C:\peak359\2SterGA2014.cal



l slope of curve: 1.79
xis intercept: 0.00
arity: 1.00
nber of levels: 4
rel SD of CF's: 0.9/66.8
.7897X
1.0000
rated: Thu Oct 23 12:51:40 2014

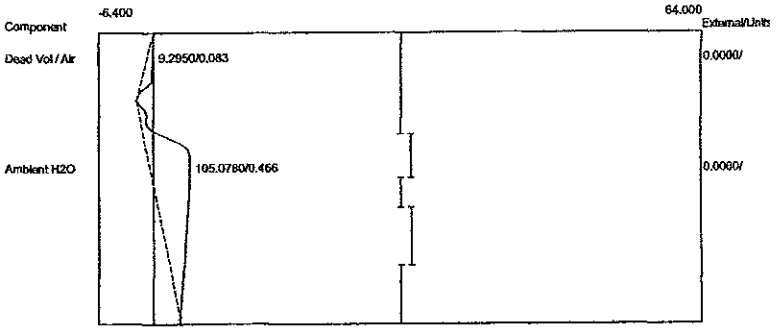
Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.900	1.100	1.727	1.900	N/A	N/A
18.500	10.100	1.832	18.500	N/A	N/A
181.000	100.000	1.810	181.000	N/A	N/A

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
ıalysis date: 10/23/2014 12:01:43
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
›. prog: eto-100.tem
›nents: eto1-100.cpt
Data file: 1SterGA2014-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



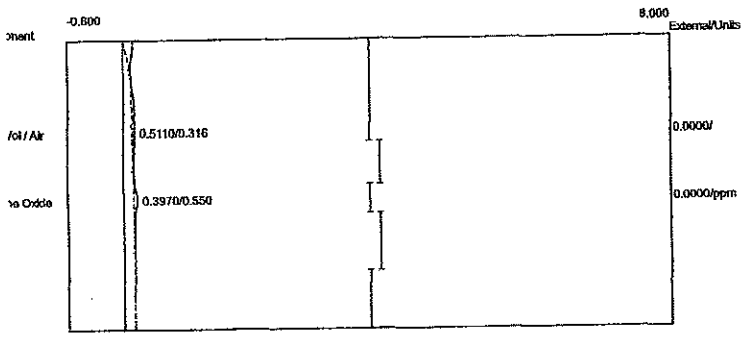
Component	Retention	Area	External	Units
ad Vol / Air	0.216	1.9780	0.0000	
bient H2O	0.400	0.1285	0.0000	
		2.1065	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:01:43
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



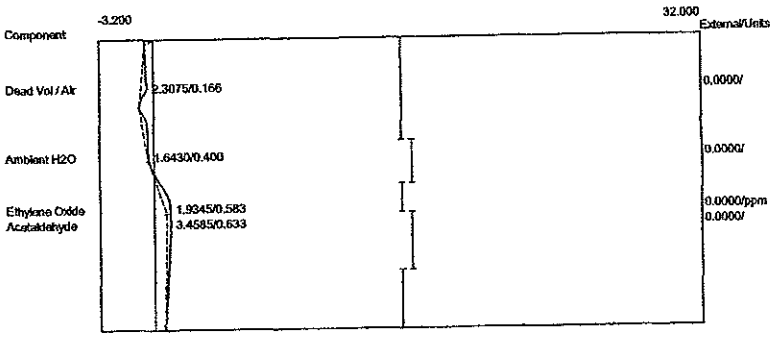
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.2950	0.0000	
Ambient H2O	0.466	105.0780	0.0000	
		114.3730	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
alysis date: 10/23/2014 12:14:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
nents: eto1-100.cpt
Data file: 1SterGA2014-C01.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



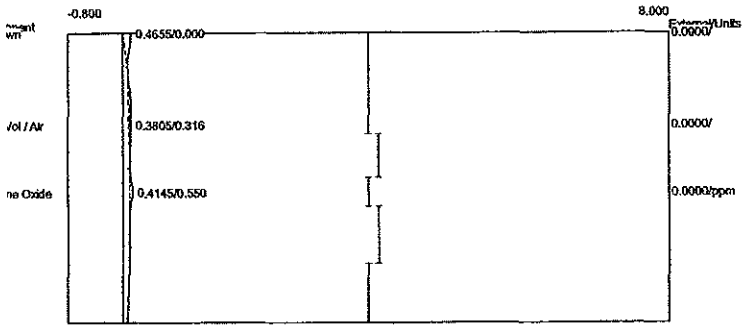
Component	Retention	Area	External	Units
ıd Vol / Air	0.316	0.5110	0.0000	
ylene Oxide	0.550	0.3970	0.0000	ppm
		0.9080	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:14:35
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C01.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



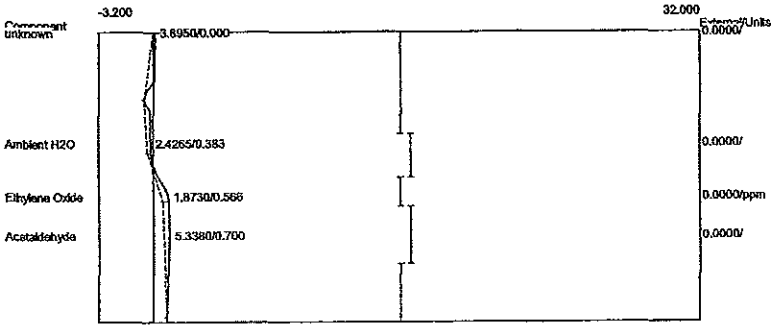
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	2.3075	0.0000	
Ambient H2O	0.400	1.6430	0.0000	
Ethylene Oxide	0.583	1.9345	0.0000	ppm
Acetaldehyde	0.633	3.4585	0.0000	
		9.3435	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
ıalysis date: 10/23/2014 12:16:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-C02.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



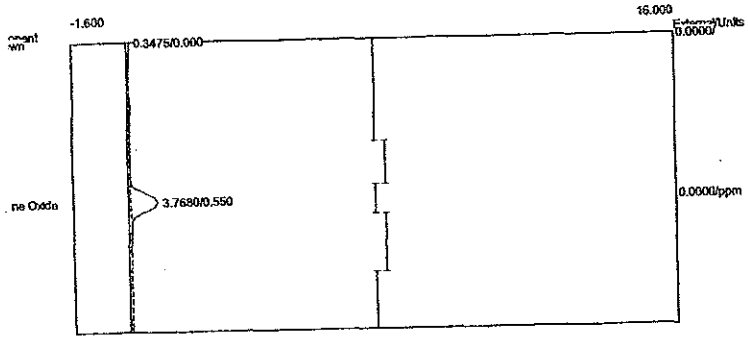
Component	Retention	Area	External	Units
ıd Vol / Air	0.316	0.3805	0.0000	
ylene Oxide	0.550	0.4145	0.0000	ppm
		0.7950	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:16:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C02.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



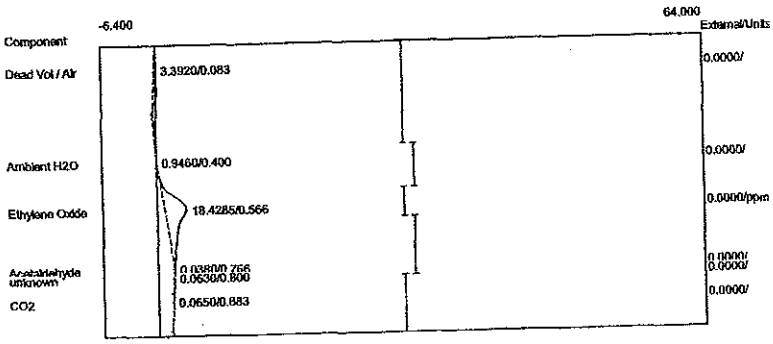
Component	Retention	Area	External	Units
Ambient H2O	0.383	2.4265	0.0000	
Ethylene Oxide	0.566	1.8730	0.0000	ppm
Acetaldehyde	0.700	5.3380	0.0000	
		9.6375	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
ıalysis date: 10/23/2014 12:20:41
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
ɹnents: eto1-100.cpt
Data file: 1SterGA2014-C03.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



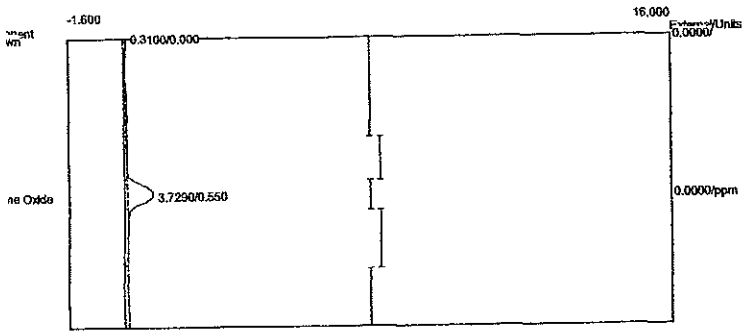
Component	Retention	Area	External	Units
ylene Oxide	0.550	3.7680	0.0000	ppm
		3.7680	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:20:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C03.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



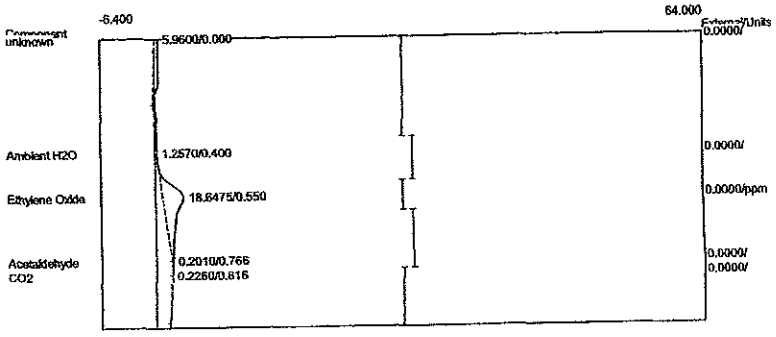
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	3.3920	0.0000	
Ambient H2O	0.400	0.9460	0.0000	
Ethylene Oxide	0.566	18.4285	0.0000	ppm
Acetaldehyde	0.766	0.0380	0.0000	
CO2	0.883	0.0650	0.0000	
		22.8695	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
ıalysis date: 10/23/2014 12:23:25
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
nents: eto1-100.cpt
Data file: 1SterGA2014-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



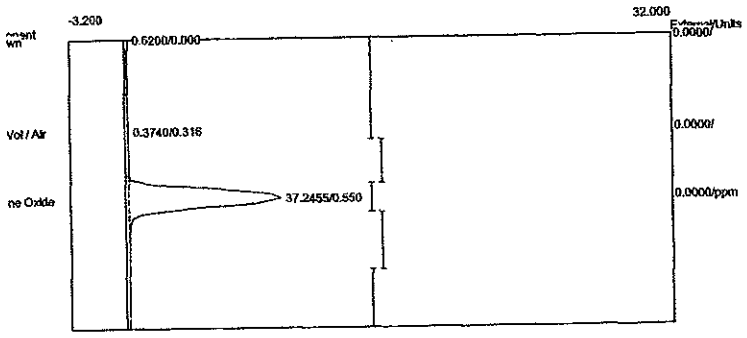
Component	Retention	Area	External	Units
ylene Oxide	0.550	3.7290	0.0000	ppm
		3.7290	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:23:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



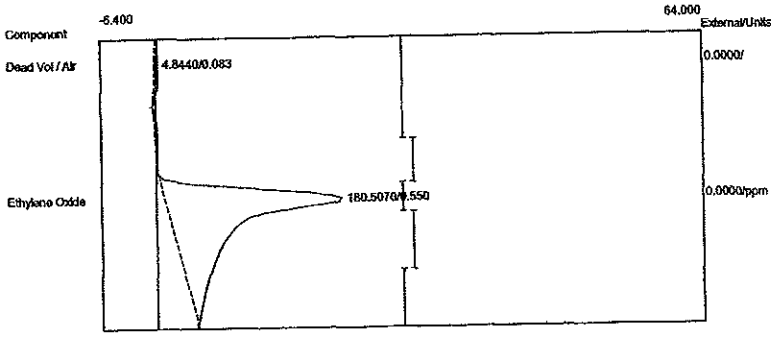
Component	Retention	Area	External	Units
Ambient H2O	0.400	1.2570	0.0000	
Ethylene Oxide	0.550	18.6475	0.0000	ppm
Acetaldehyde	0.766	0.2010	0.0000	
CO2	0.816	0.2260	0.0000	
		20.3315	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
ıalysis date: 10/23/2014 12:31:29
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
[illegible]. prog: eto-100.tem
[illegible]nents: eto1-100.cpt
Data file: 1SterGA2014-C05.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



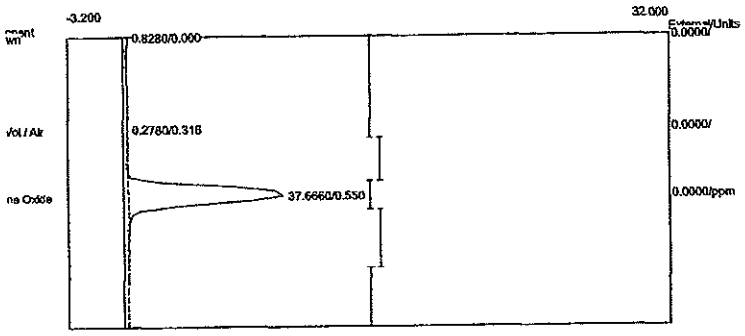
Component	Retention	Area	External	Units
ad Vol / Air	0.316	0.3740	0.0000	
ylene Oxide	0.550	37.2455	0.0000	ppm
		37.6195	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:31:29
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C05.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



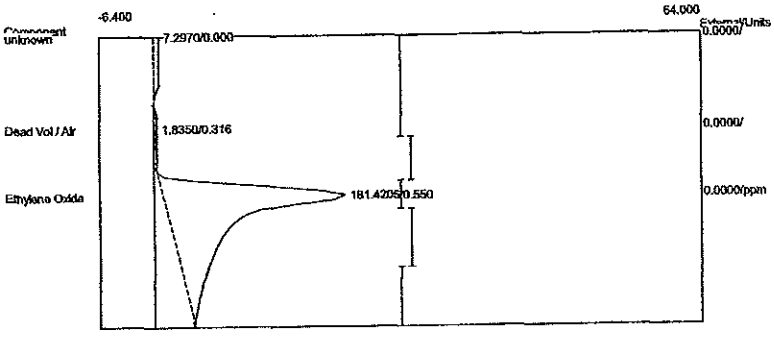
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	4.8440	0.0000	
Ethylene Oxide	0.550	180.5070	0.0000	ppm
		185.3510	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:34:41
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGA2014-C06.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



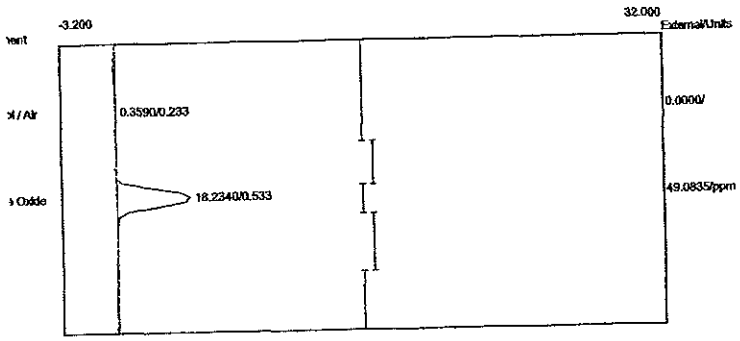
Component	Retention	Area	External	Units
Dead Vol / Air	0.316	0.2780	0.0000	
Ethylene Oxide	0.550	37.6660	0.0000	ppm
		37.9440	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:34:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C06.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



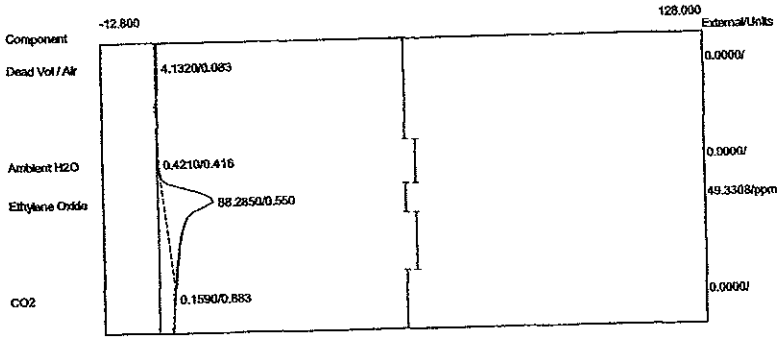
Component	Retention	Area	External	Units
Dead Vol / Air	0.316	1.8350	0.0000	
Ethylene Oxide	0.550	181.4205	0.0000	ppm
		183.2555	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
ılysis date: 10/23/2014 12:51:00
Method: Direct Injection
lescription: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
prog: eto-100.tem
ıents: eto1-100.cpt
Data file: 1SterGA2014-C07.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



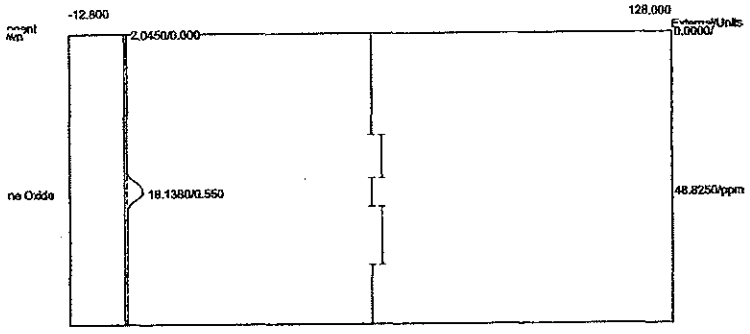
Component	Retention	Area	External	Units
d Vol / Air	0.233	0.3590	0.0000	
ılene Oxide	0.533	18.2340	49.0835	ppm
		18.5930	49.0835	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/23/2014 12:51:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C07.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



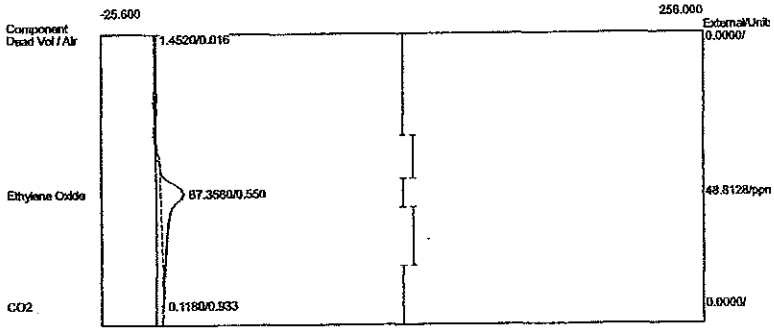
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	4.1320	0.0000	
Ambient H2O	0.416	0.4210	0.0000	
Ethylene Oxide	0.550	88.2850	49.3308	ppm
CO2	0.883	0.1590	0.0000	
		92.9970	49.3308	

Client: Sterigenics - Smyrna, GA
Client ID: PostCal
ıalysis date: 10/23/2014 16:04:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ı. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-C08.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



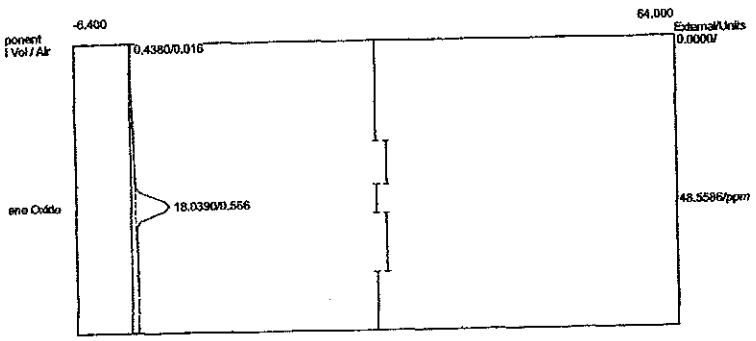
Component	Retention	Area	External	Units
ylene Oxide	0.550	18.1380	48.8250	ppm
		18.1380	48.8250	

Client: Sterigenics - Smyrna, GA
Client ID: PostCal
Analysis date: 10/23/2014 16:04:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C08.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



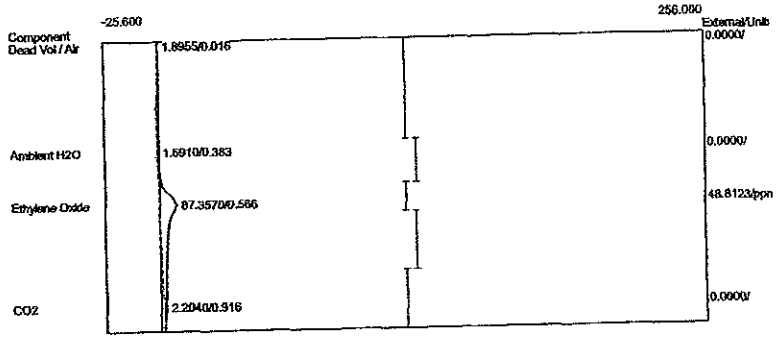
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	1.4520	0.0000	
Ethylene Oxide	0.550	87.3580	48.8128	ppm
CO2	0.933	0.1180	0.0000	
		88.9280	48.8128	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
nalysis date: 10/24/2014 09:35:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-C09.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



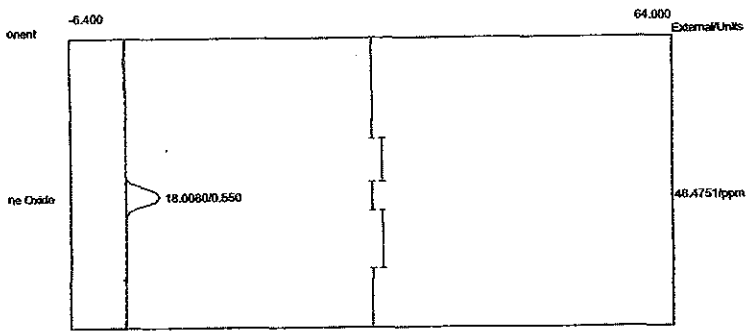
Component	Retention	Area	External	Units
ad Vol / Air	0.016	0.4380	0.0000	
ylene Oxide	0.566	18.0390	48.5586	ppm
		18.4770	48.5586	

Client: Sterigenics - Smyrna, GA
Client ID: PreCal
Analysis date: 10/24/2014 09:35:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C09.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



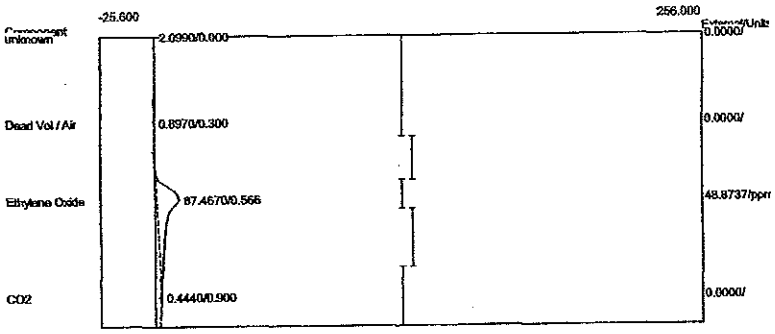
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	1.8955	0.0000	
Ambient H2O	0.383	1.6910	0.0000	
Ethylene Oxide	0.566	87.3570	48.8123	ppm
CO2	0.916	2.2040	0.0000	
		93.1475	48.8123	

Client: Sterigenics - Smyrna, GA
Client ID: PostCal
ıalysis date: 10/24/2014 12:41:43
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
nents: eto1-100.cpt
Data file: 1SterGA2014-C10.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ıylene Oxide	0.550	18.0080	48.4751	ppm
		18.0080	48.4751	

Client: Sterigenics - Smyrna, GA
Client ID: PostCal
Analysis date: 10/24/2014 12:41:43
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-C10.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer

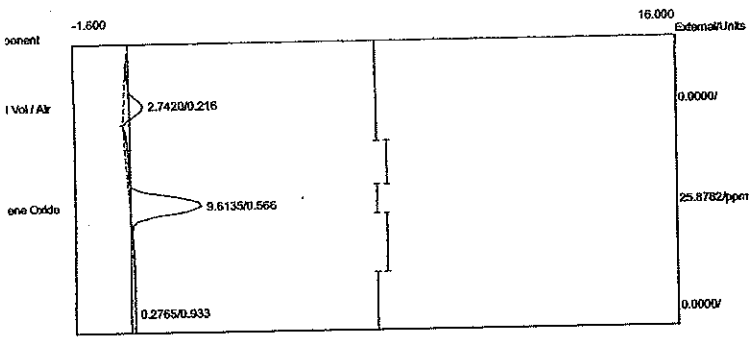


Component	Retention	Area	External	Units
Dead Vol / Air	0.300	0.8970	0.0000	
Ethylene Oxide	0.566	87.4670	48.8737	ppm
CO2	0.900	0.4440	0.0000	
		88.8080	48.8737	

APPENDIX B

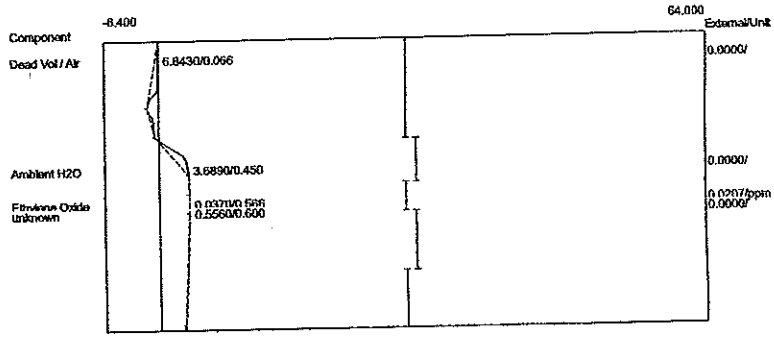
Run#1 Chromatograms

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
nalysis date: 10/24/2014 09:42:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
), prog: eto-100.tem
,onents: eto1-100.cpt
Data file: 1SterGA2014-1A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



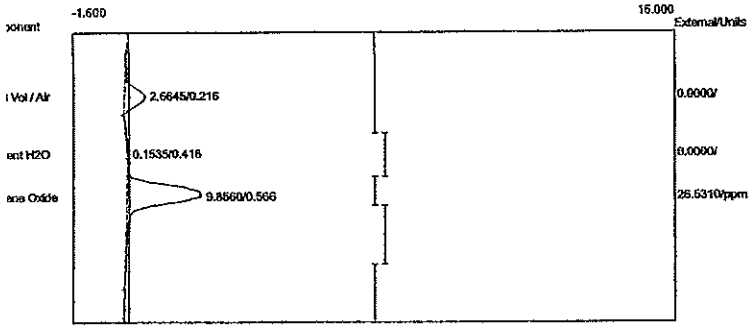
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.7420	0.0000	
ıylene Oxide	0.566	9.6135	25.8782	ppm
)2	0.933	0.2765	0.0000	
		12.6320	25.8782	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 09:42:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



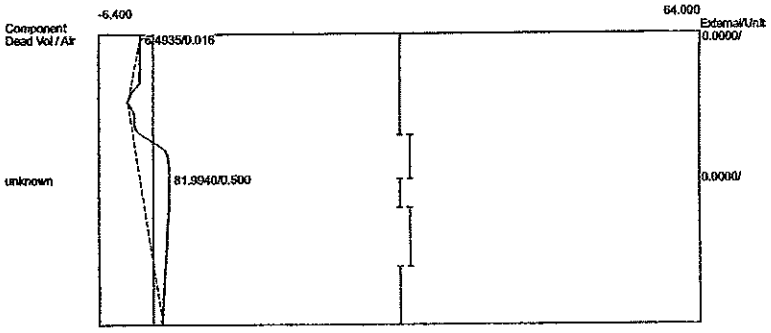
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	6.8430	0.0000	
Ambient H2O	0.450	3.6890	0.0000	
Ethylene Oxide	0.566	0.0370	0.0207	ppm
		10.5690	0.0207	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
nalysis date: 10/24/2014 09:47:38
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
T[illegible]o. prog: eto-100.tem
[illegible]nents: eto1-100.cpt
Data file: 1SterGA2014-1A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



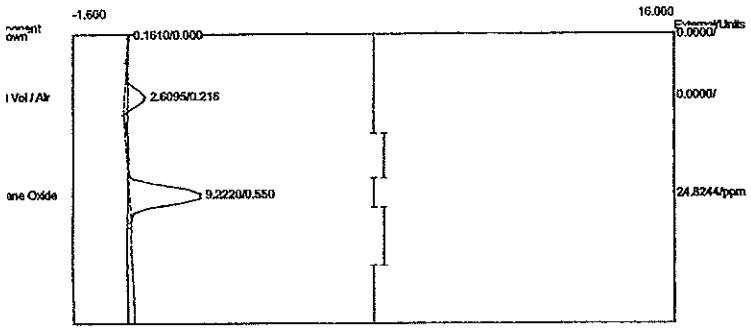
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6645	0.0000	
ıbient H2O	0.416	0.1535	0.0000	
ıylene Oxide	0.566	9.8560	26.5310	ppm
		12.6740	26.5310	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 09:47:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



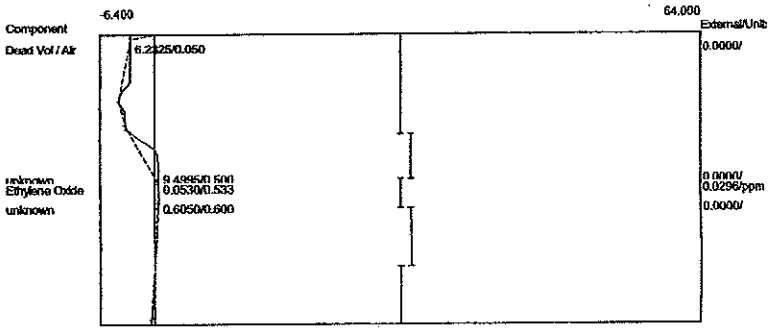
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	6.4935	0.0000	
		6.4935	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
nalysis date: 10/24/2014 09:52:24
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-1A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



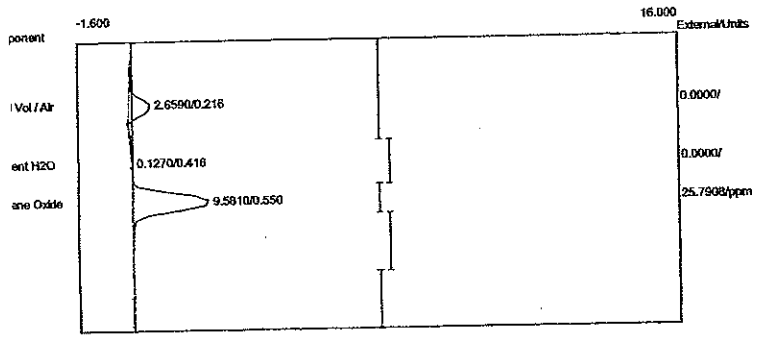
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6095	0.0000	
ıylene Oxide	0.550	9.2220	24.8244	ppm
		11.8315	24.8244	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 09:52:24
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



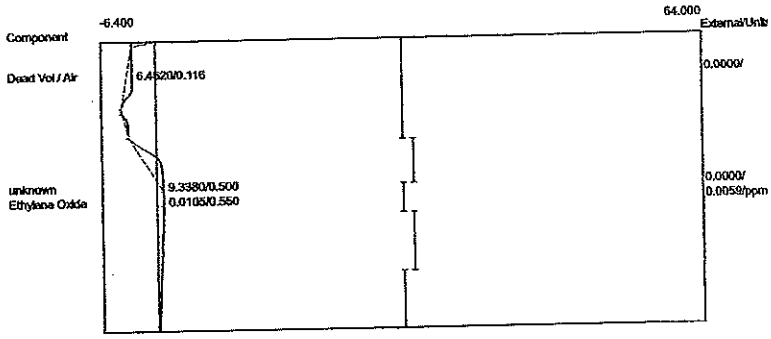
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	6.2325	0.0000	
Ethylene Oxide	0.533	0.0530	0.0296	ppm
		6.2855	0.0296	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
nalysis date: 10/24/2014 09:58:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-1A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



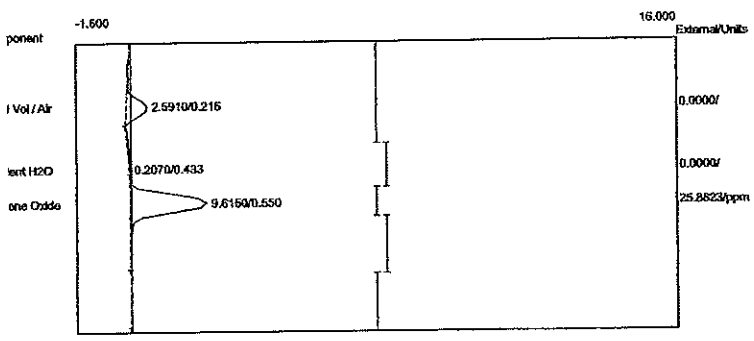
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6590	0.0000	
ıbient H2O	0.416	0.1270	0.0000	
ıylene Oxide	0.550	9.5810	25.7908	ppm
		12.3670	25.7908	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 09:58:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



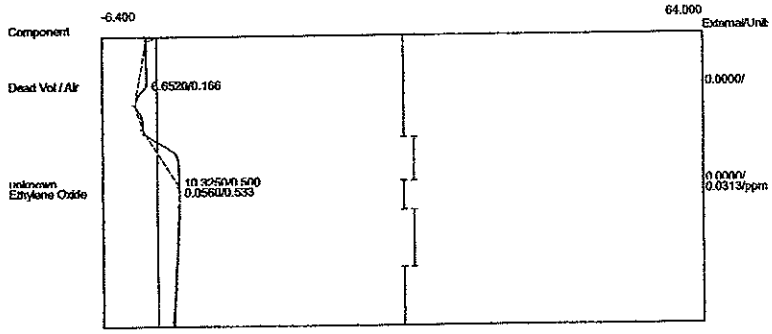
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	6.4520	0.0000	
Ethylene Oxide	0.550	0.0105	0.0059	ppm
		6.4625	0.0059	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
nalysis date: 10/24/2014 10:02:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-1A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



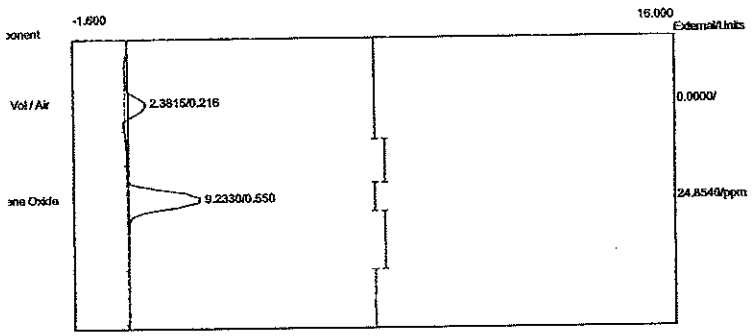
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.5910	0.0000	
ıbient H2O	0.433	0.2070	0.0000	
ıylene Oxide	0.550	9.6150	25.8823	ppm
		12.4130	25.8823	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:02:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



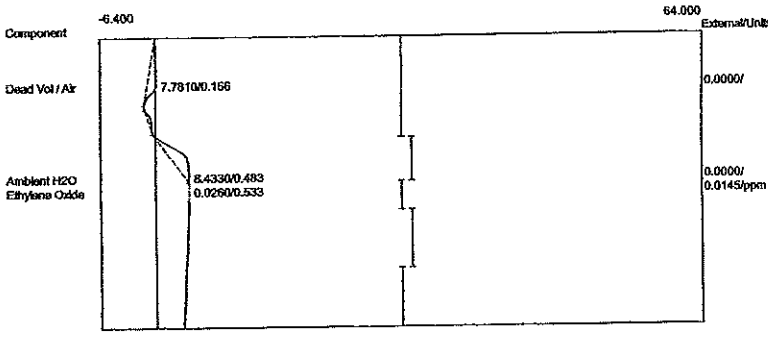
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	6.6520	0.0000	
Ethylene Oxide	0.533	0.0560	0.0313	ppm
		6.7080	0.0313	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
nalysis date: 10/24/2014 10:07:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-1A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



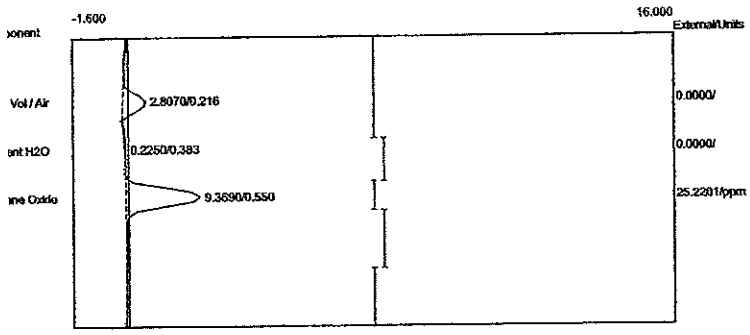
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.3815	0.0000	
ıylene Oxide	0.550	9.2330	24.8540	ppm
		11.6145	24.8540	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:07:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



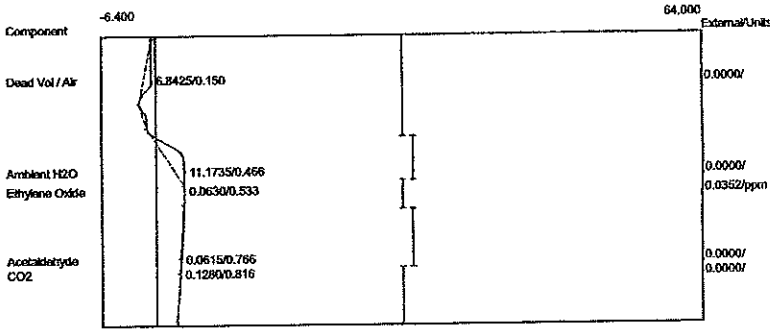
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	7.7810	0.0000	
Ambient H2O	0.483	8.4330	0.0000	
Ethylene Oxide	0.533	0.0260	0.0145	ppm
		16.2400	0.0145	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
ıalysis date: 10/24/2014 10:12:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-1A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



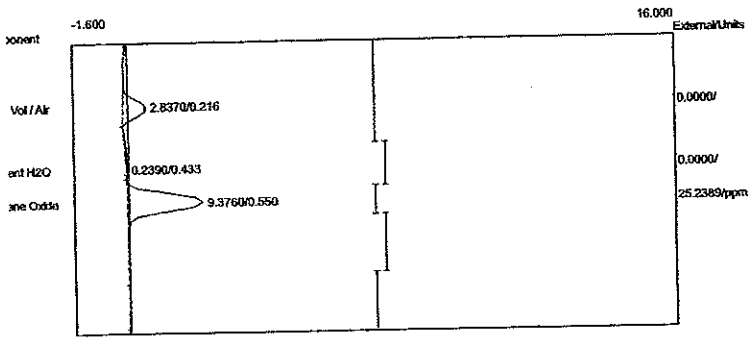
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.8070	0.0000	
ıbient H2O	0.383	0.2250	0.0000	
ıylene Oxide	0.550	9.3690	25.2201	ppm
		12.4010	25.2201	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:12:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



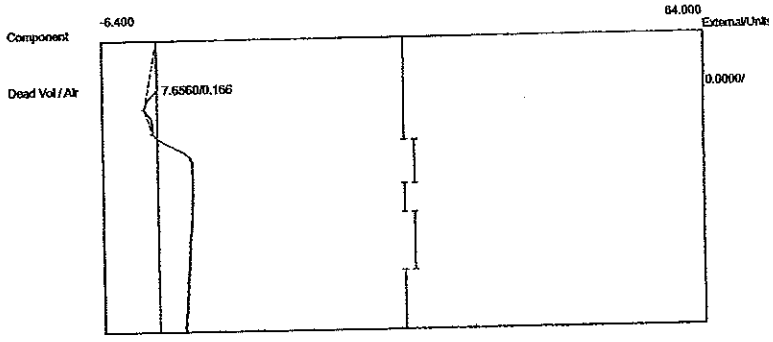
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	6.8425	0.0000	
Ambient H2O	0.466	11.1735	0.0000	
Ethylene Oxide	0.533	0.0630	0.0352	ppm
Acetaldehyde	0.766	0.0615	0.0000	
CO2	0.816	0.1280	0.0000	
		18.2685	0.0352	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
ıalysis date: 10/24/2014 10:17:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
.onents: eto1-100.cpt
Data file: 1SterGA2014-1A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



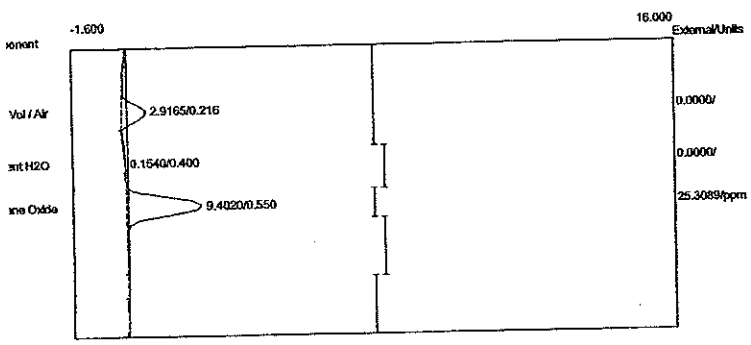
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.8370	0.0000	
ıbient H2O	0.433	0.2390	0.0000	
ıylene Oxide	0.550	9.3760	25.2389	ppm
		12.4520	25.2389	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:17:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



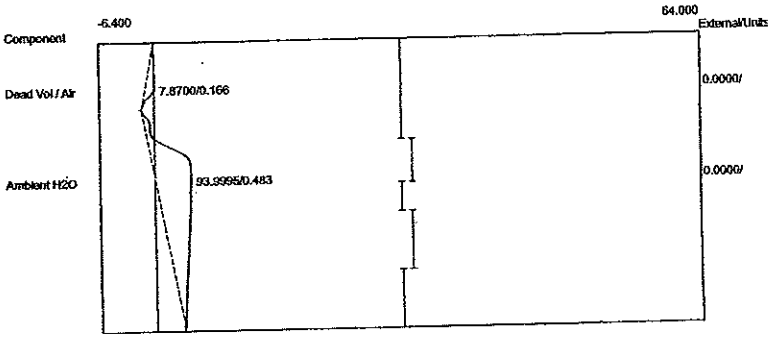
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	7.6560	0.0000	
		7.6560	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
ıalysis date: 10/24/2014 10:22:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ı. prog: eto-100.tem
ponents: eto1-100.cpt
Data file: 1SterGA2014-1A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



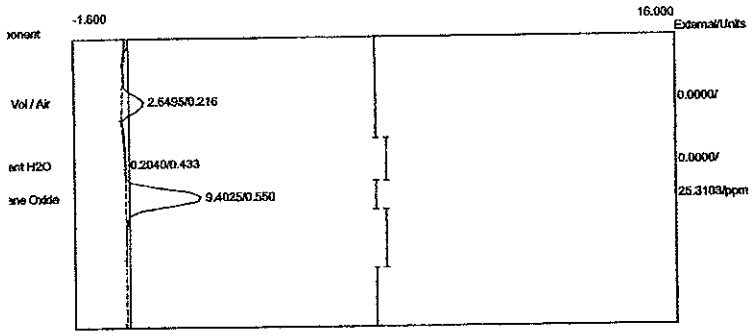
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.9165	0.0000	
ıbient H2O	0.400	0.1540	0.0000	
ylene Oxide	0.550	9.4020	25.3089	ppm
		12.4725	25.3089	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:22:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



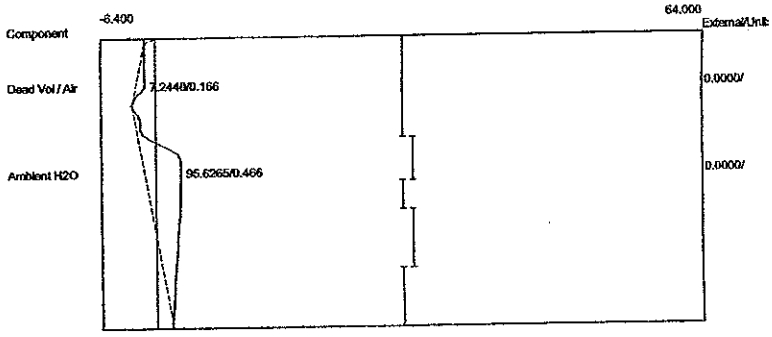
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	7.8700	0.0000	
Ambient H2O	0.483	93.9995	0.0000	
		101.8695	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
ıalysis date: 10/24/2014 10:27:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
'p. prog: eto-100.tem
ponents: eto1-100.cpt
Data file: 1SterGA2014-1A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



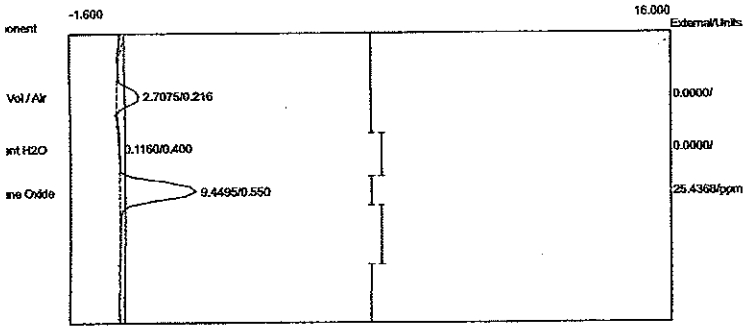
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6495	0.0000	
ıbient H2O	0.433	0.2040	0.0000	
ylene Oxide	0.550	9.4025	25.3103	ppm
		12.2560	25.3103	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:27:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



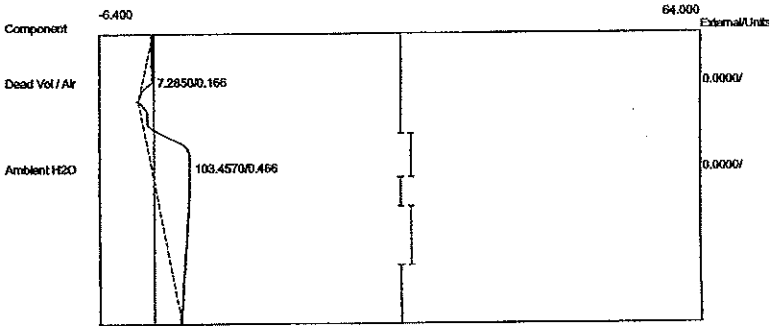
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	7.2440	0.0000	
Ambient H2O	0.466	95.6265	0.0000	
		102.8705	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:32:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGA2014-1A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



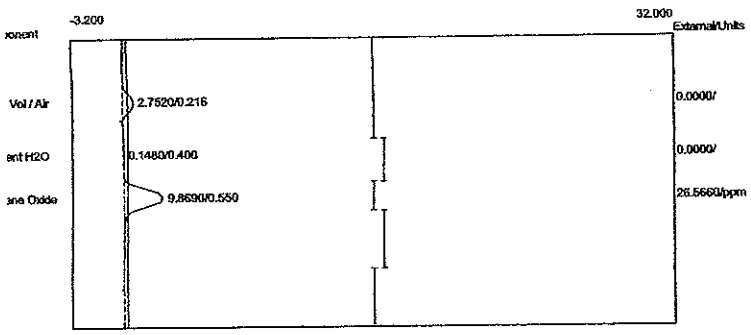
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.7075	0.0000	
ıbient H2O	0.400	0.1160	0.0000	
ıylene Oxide	0.550	9.4495	25.4368	ppm
		12.2730	25.4368	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:32:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



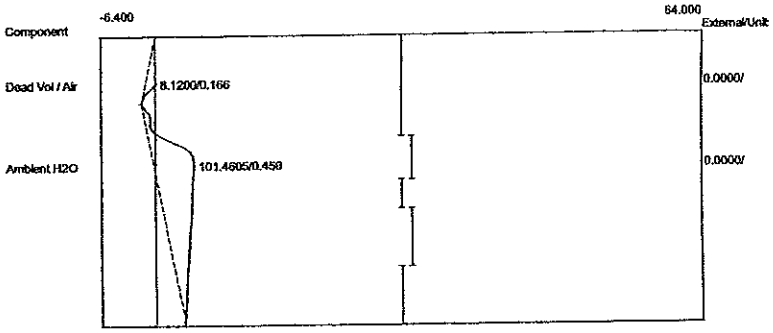
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	7.2850	0.0000	
Ambient H2O	0.466	103.4570	0.0000	
		110.7420	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
ıalysis date: 10/24/2014 10:37:26
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-1A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.7520	0.0000	
ıbient H2O	0.400	0.1480	0.0000	
ıylene Oxide	0.550	9.8690	26.5660	ppm
		12.7690	26.5660	

Client: Sterigenics - Smyrna, GA
Client ID: Run#1Aer
Analysis date: 10/24/2014 10:37:26
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-1A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



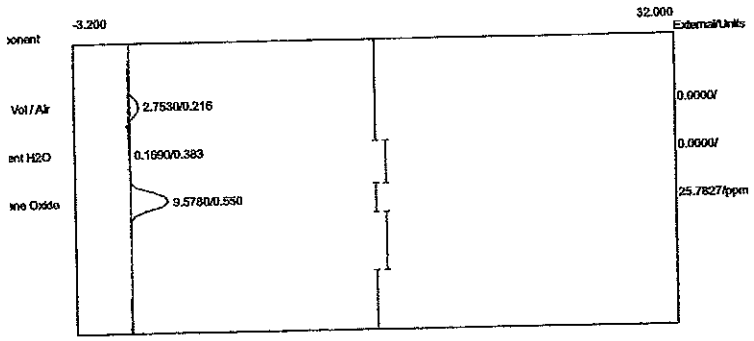
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	8.1200	0.0000	
Ambient H2O	0.450	101.4605	0.0000	
		109.5805	0.0000	

APPENDIX C

Run#2 Chromatograms

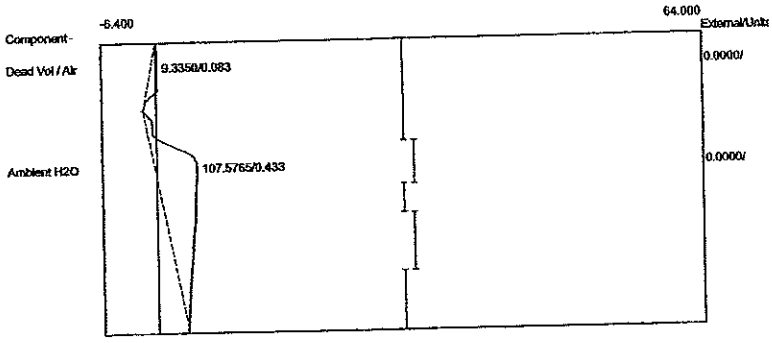
ECSi

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 10:42:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
`p. prog: eto-100.tem
,onents: eto1-100.cpt
Data file: 1SterGA2014-2A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



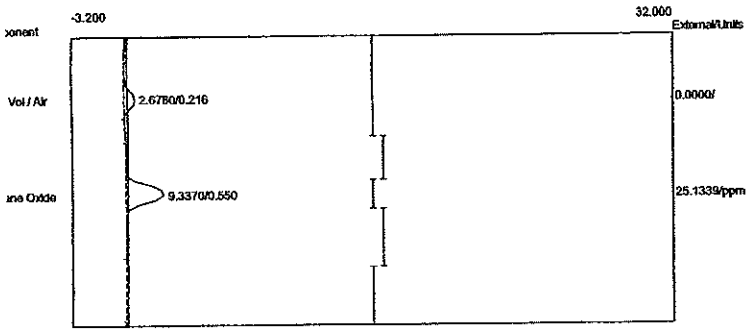
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.7530	0.0000	
ıbient H2O	0.383	0.1690	0.0000	
ıylene Oxide	0.550	9.5780	25.7827	ppm
		12.5000	25.7827	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 10:42:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



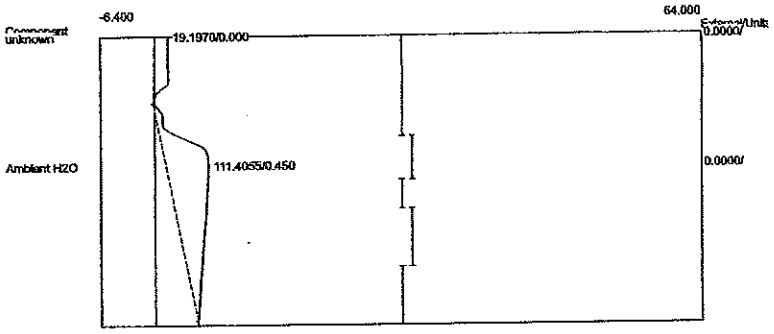
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.3350	0.0000	
Ambient H2O	0.433	107.5765	0.0000	
		116.9115	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 10:47:57
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-2A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



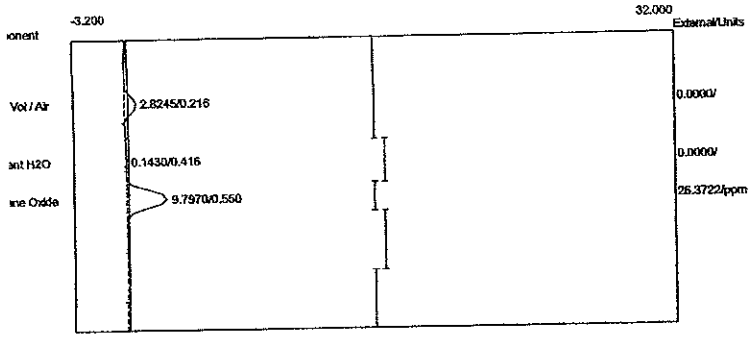
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6780	0.0000	
ıylene Oxide	0.550	9.3370	25.1339	ppm
		12.0150	25.1339	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 10:47:57
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



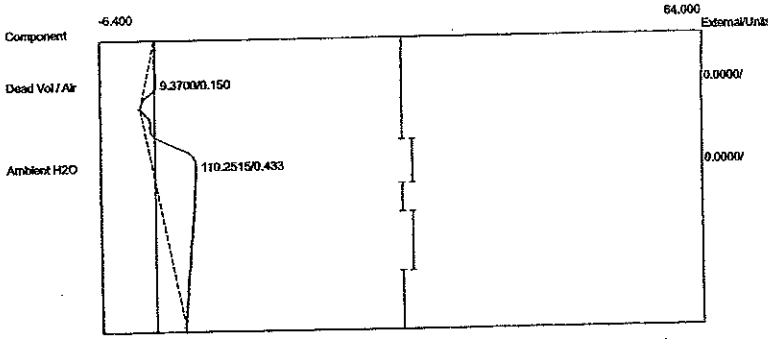
Component	Retention	Area	External	Units
Ambient H2O	0.450	111.4055	0.0000	
		111.4055	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 10:52:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
.onents: eto1-100.cpt
Data file: 1SterGA2014-2A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



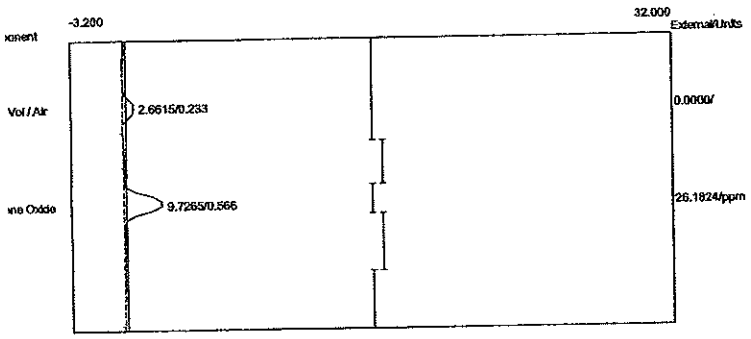
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.8245	0.0000	
ıbient H2O	0.416	0.1430	0.0000	
ıylene Oxide	0.550	9.7970	26.3722	ppm
		12.7645	26.3722	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 10:52:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



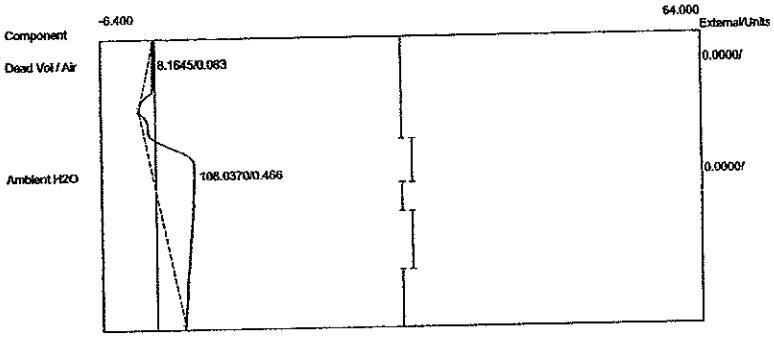
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	9.3700	0.0000	
Ambient H2O	0.433	110.2515	0.0000	
		119.6215	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 10:57:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-2A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



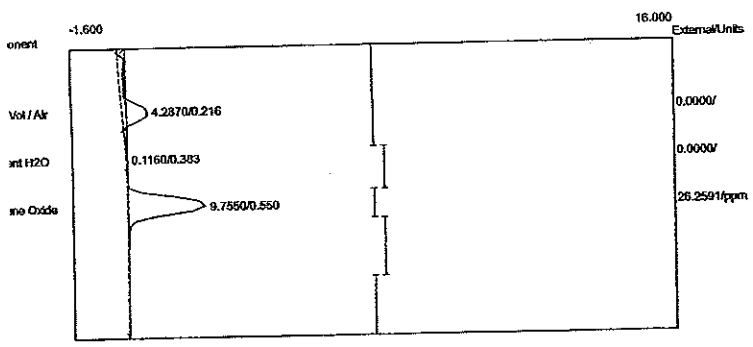
Component	Retention	Area	External	Units
ad Vol / Air	0.233	2.6615	0.0000	
ıylene Oxide	0.566	9.7265	26.1824	ppm
		12.3880	26.1824	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 10:57:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



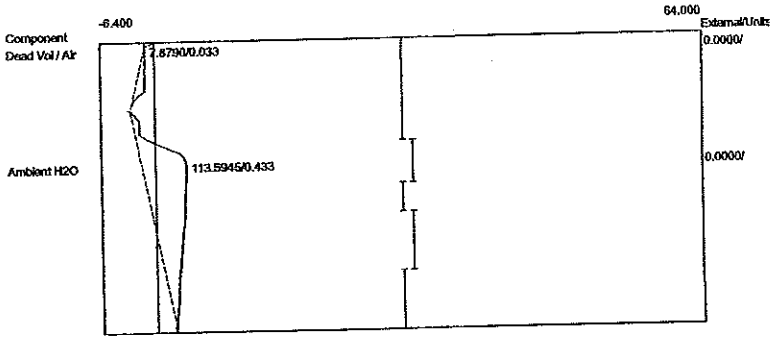
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	8.1645	0.0000	
Ambient H2O	0.466	108.0370	0.0000	
		116.2015	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 11:02:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ı. prog: eto-100.tem
.onents: eto1-100.cpt
Data file: 1SterGA2014-2A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



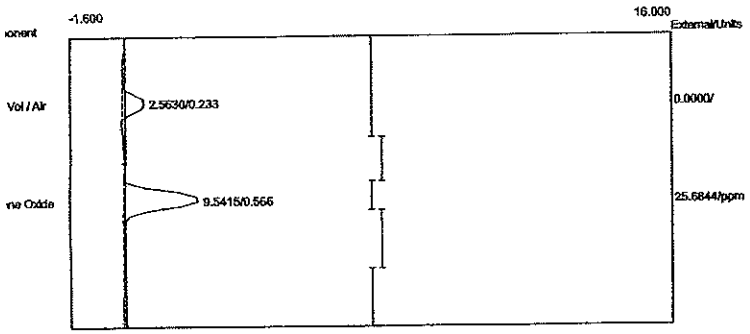
Component	Retention	Area	External	Units
ad Vol / Air	0.216	4.2870	0.0000	
ıbient H2O	0.383	0.1160	0.0000	
ıylene Oxide	0.550	9.7550	26.2591	ppm
		14.1580	26.2591	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:02:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



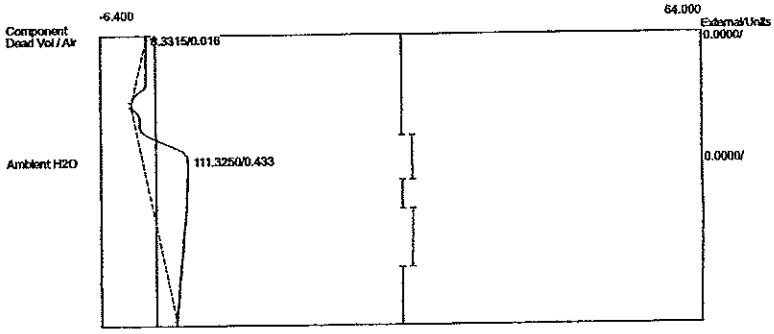
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	7.8790	0.0000	
Ambient H2O	0.433	113.5945	0.0000	
		121.4735	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 11:07:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-2A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



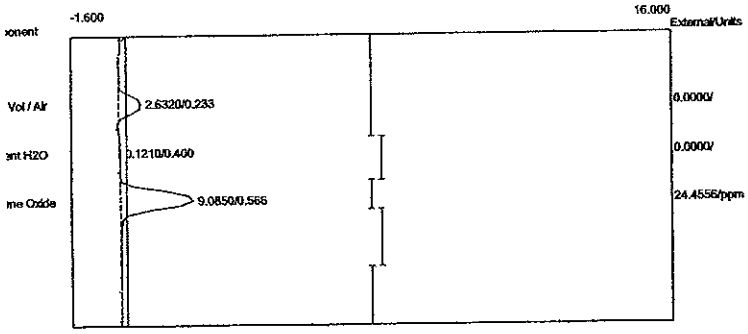
Component	Retention	Area	External	Units
ad Vol / Air	0.233	2.5630	0.0000	
ıylene Oxide	0.566	9.5415	25.6844	ppm
		12.1045	25.6844	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:07:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



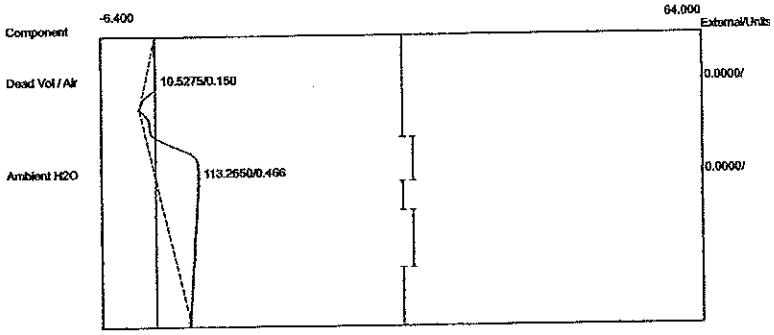
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	8.3315	0.0000	
Ambient H2O	0.433	111.3250	0.0000	
		119.6565	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 11:12:58
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
ˌonents: eto1-100.cpt
Data file: 1SterGA2014-2A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



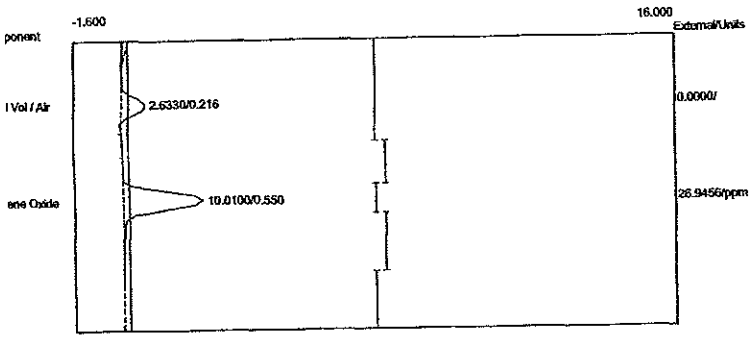
Component	Retention	Area	External	Units
ad Vol / Air	0.233	2.6320	0.0000	
ıbient H2O	0.400	0.1210	0.0000	
ıylene Oxide	0.566	9.0850	24.4556	ppm
		11.8380	24.4556	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:12:58
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



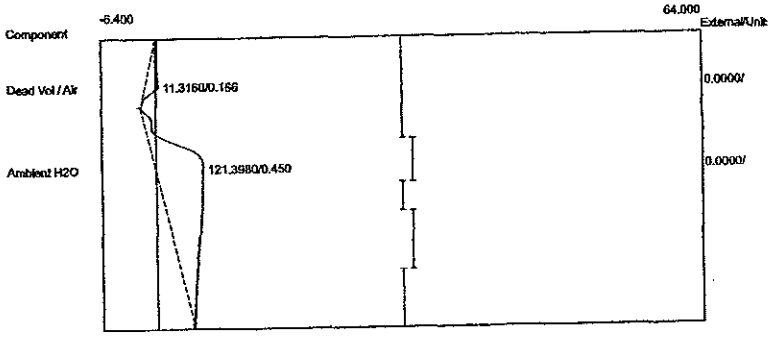
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	10.5275	0.0000	
Ambient H2O	0.466	113.2650	0.0000	
		123.7925	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
nalysis date: 10/24/2014 11:17:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ıp. prog: eto-100.tem
ponents: eto1-100.cpt
Data file: 1SterGA2014-2A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



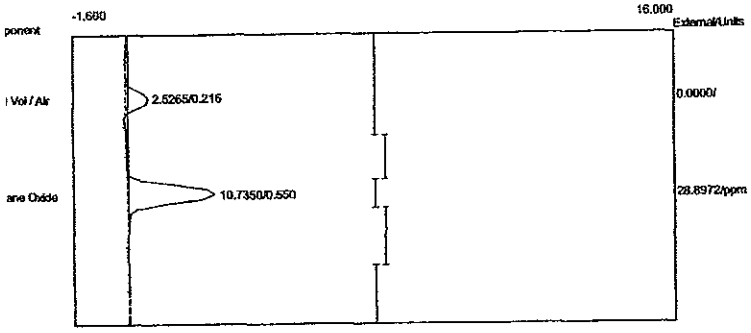
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6330	0.0000	
ıylene Oxide	0.550	10.0100	26.9456	ppm
		12.6430	26.9456	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:17:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



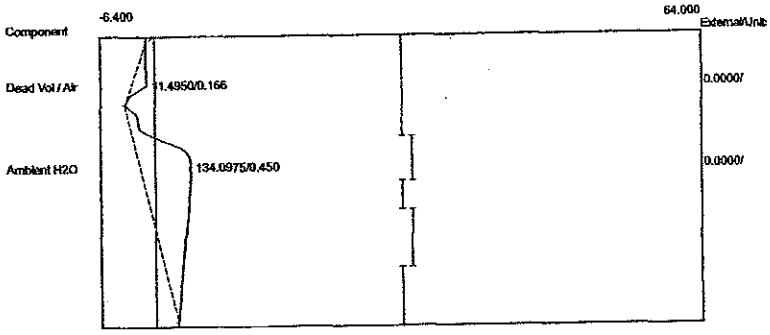
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	11.3160	0.0000	
Ambient H2O	0.450	121.3980	0.0000	
		132.7140	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
nalysis date: 10/24/2014 11:27:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
np. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-2A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



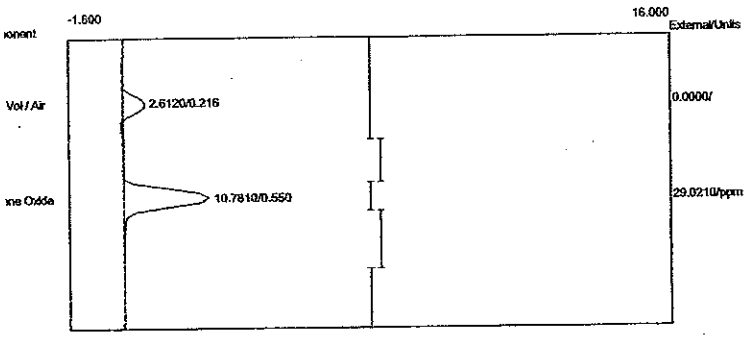
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.5265	0.0000	
ıylene Oxide	0.550	10.7350	28.8972	ppm
		13.2615	28.8972	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:27:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



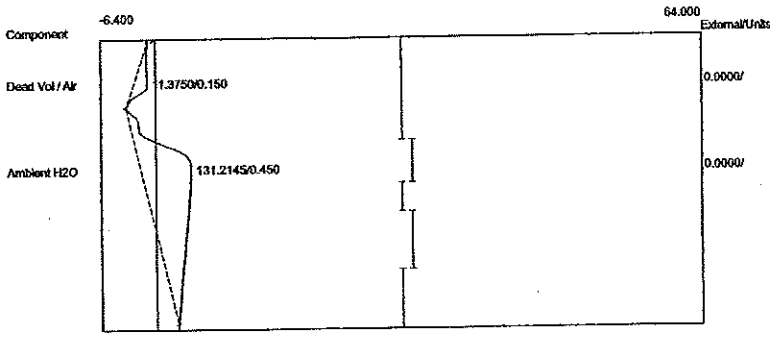
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	11.4950	0.0000	
Ambient H2O	0.450	134.0975	0.0000	
		145.5925	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 11:32:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
ɔonents: eto1-100.cpt
Data file: 1SterGA2014-2A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



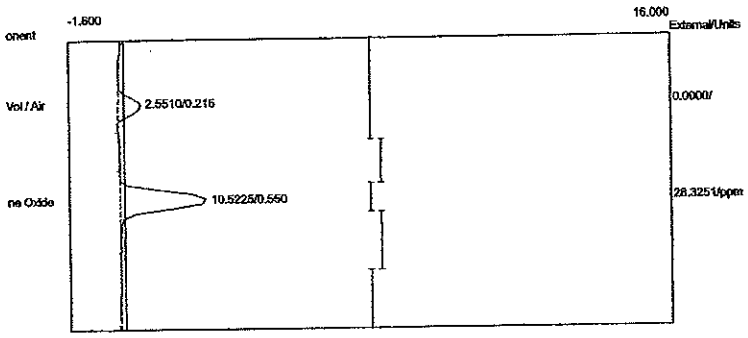
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6120	0.0000	
ıylene Oxide	0.550	10.7810	29.0210	ppm
		13.3930	29.0210	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:32:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



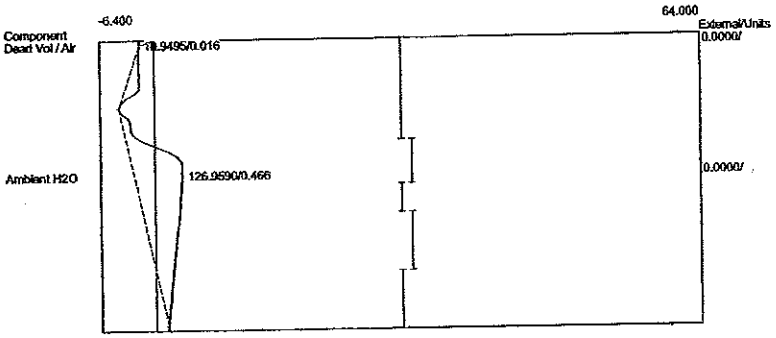
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	11.3750	0.0000	
Ambient H2O	0.450	131.2145	0.0000	
		142.5895	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
ıalysis date: 10/24/2014 11:37:22
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
.onents: eto1-100.cpt
Data file: 1SterGA2014-2A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.5510	0.0000	
ylene Oxide	0.550	10.5225	28.3251	ppm
		13.0735	28.3251	

Client: Sterigenics - Smyrna, GA
Client ID: Run#2Aer
Analysis date: 10/24/2014 11:37:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-2A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



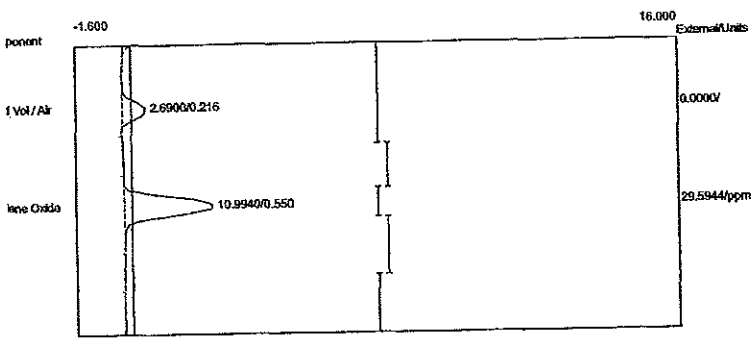
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	10.9495	0.0000	
Ambient H2O	0.466	126.9590	0.0000	
		137.9085	0.0000	

APPENDIX D

Run#3 Chromatograms

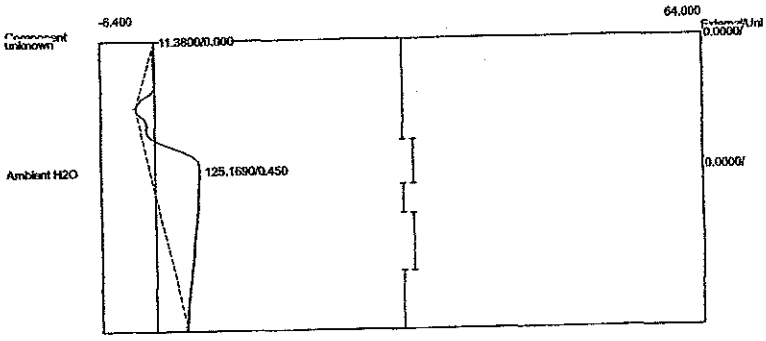
ECSi

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
nalysis date: 10/24/2014 11:42:28
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ıp. prog: eto-100.tem
ponents: eto1-100.cpt
Data file: 1SterGA2014-3A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



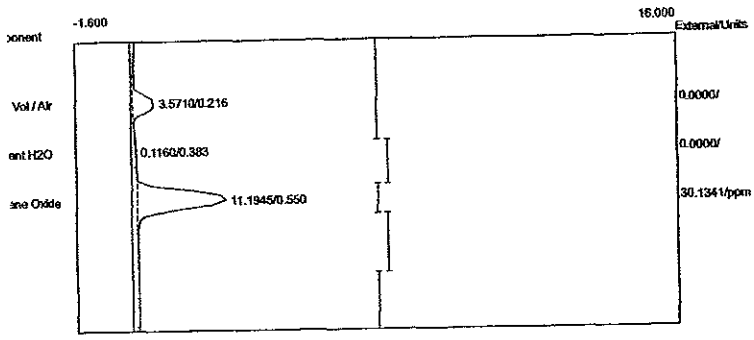
Component	Retention	Area	External	Units
ıad Vol / Air	0.216	2.6900	0.0000	
ıylene Oxide	0.550	10.9940	29.5944	ppm
		13.6840	29.5944	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 11:42:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



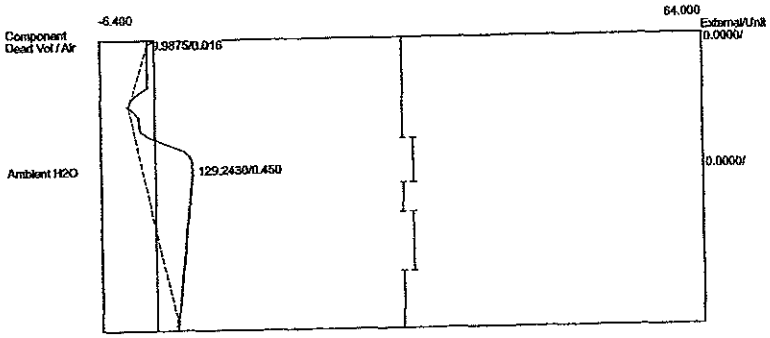
Component	Retention	Area	External	Units
Ambient H2O	0.450	125.1690	0.0000	
		125.1690	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 11:47:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ıp. prog: eto-100.tem
ponents: eto1-100.cpt
Data file: 1SterGA2014-3A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



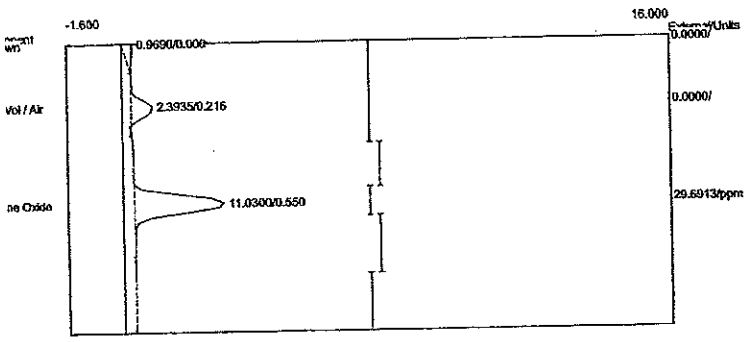
Component	Retention	Area	External	Units
ad Vol / Air	0.216	3.5710	0.0000	
ıbient H2O	0.383	0.1160	0.0000	
ıylene Oxide	0.550	11.1945	30.1341	ppm
		14.8815	30.1341	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 11:47:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



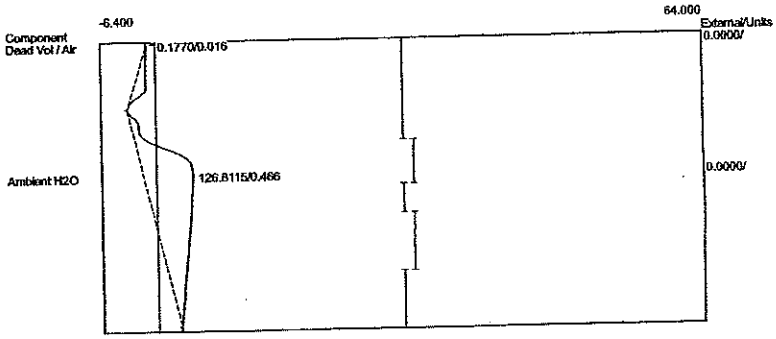
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	9.9875	0.0000	
Ambient H2O	0.450	129.2430	0.0000	
		139.2305	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 11:52:02
Method: Direct Injection
)escription: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ɔ. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-3A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



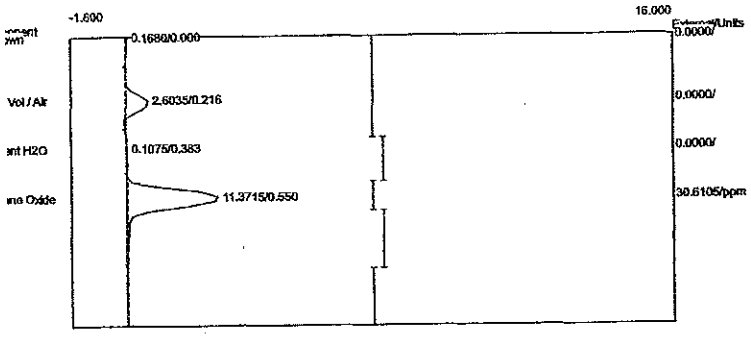
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.3935	0.0000	
ylene Oxide	0.550	11.0300	29.6913	ppm
		13.4235	29.6913	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 11:52:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



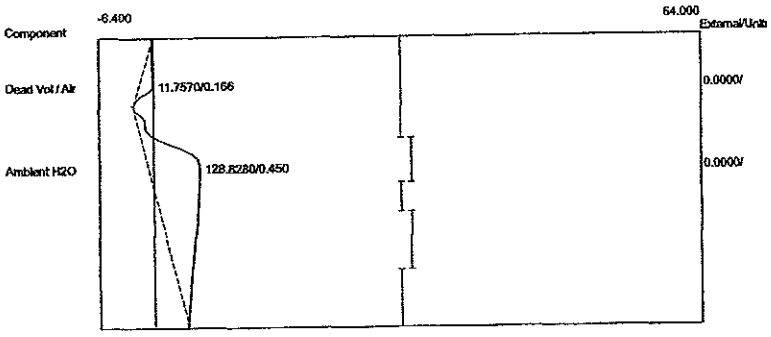
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	10.1770	0.0000	
Ambient H2O	0.466	126.8115	0.0000	
		136.9885	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 11:57:25
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ˈp. prog: eto-100.tem
ˌonents: eto1-100.cpt
Data file: 1SterGA2014-3A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



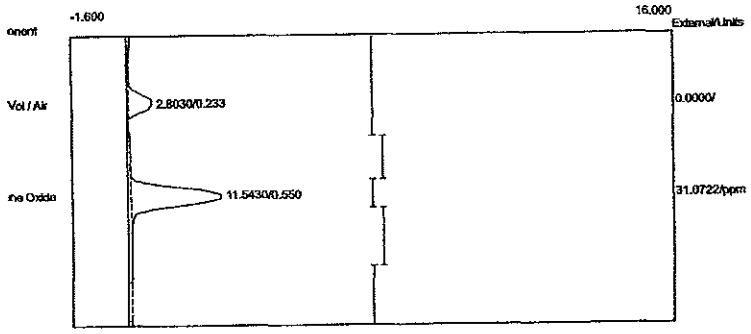
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.6035	0.0000	
ıbient H2O	0.383	0.1075	0.0000	
ıylene Oxide	0.550	11.3715	30.6105	ppm
		14.0825	30.6105	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 11:57:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



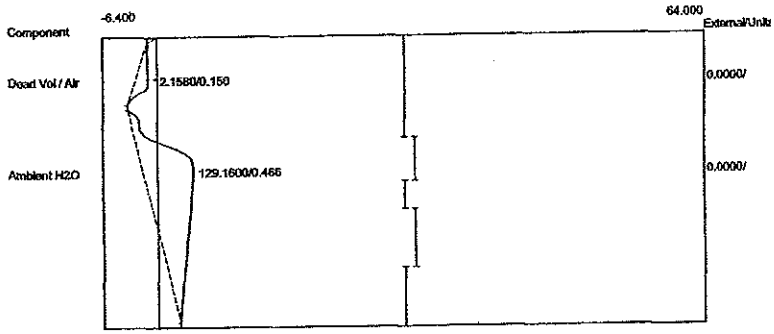
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	11.7570	0.0000	
Ambient H2O	0.450	128.8280	0.0000	
		140.5850	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 12:02:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
ıp. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-3A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



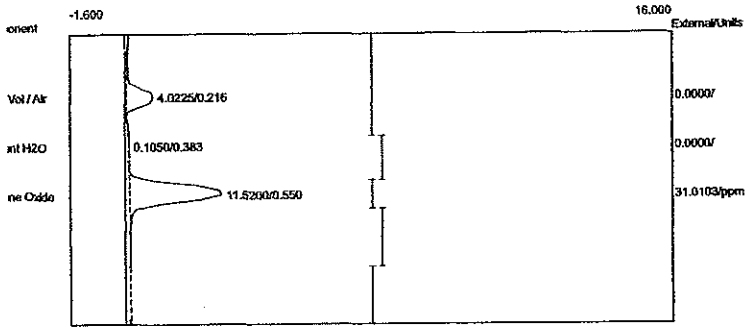
Component	Retention	Area	External	Units
ad Vol / Air	0.233	2.8030	0.0000	
ıylene Oxide	0.550	11.5430	31.0722	ppm
		14.3460	31.0722	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:02:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



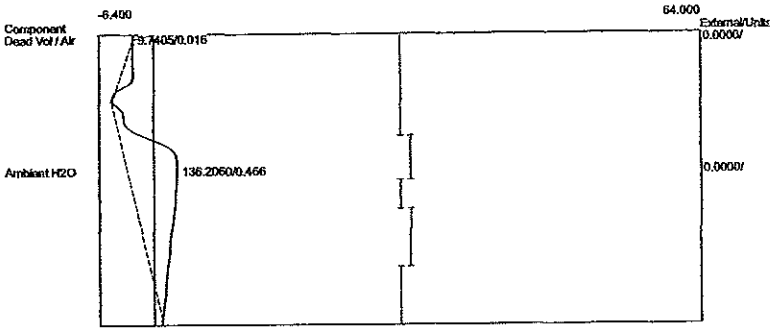
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	12.1580	0.0000	
Ambient H2O	0.466	129.1600	0.0000	
		141.3180	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:07:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGA2014-3A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



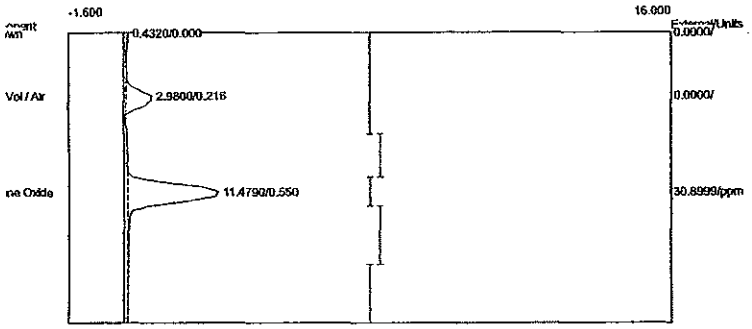
Component	Retention	Area	External	Units
ad Vol / Air	0.216	4.0225	0.0000	
ibient H2O	0.383	0.1050	0.0000	
ylene Oxide	0.550	11.5200	31.0103	ppm
		15.6475	31.0103	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:07:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



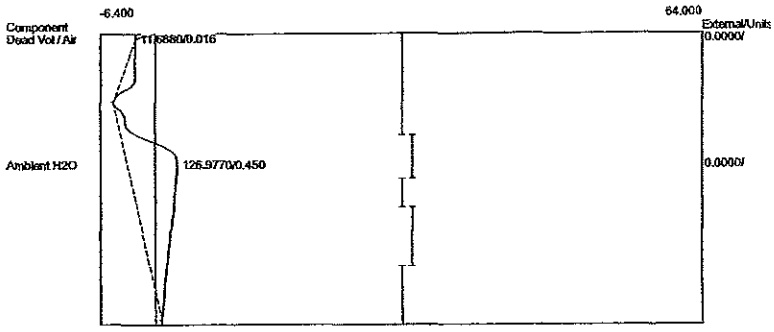
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	9.7405	0.0000	
Ambient H2O	0.466	136.2060	0.0000	
		145.9465	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 12:12:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-3A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



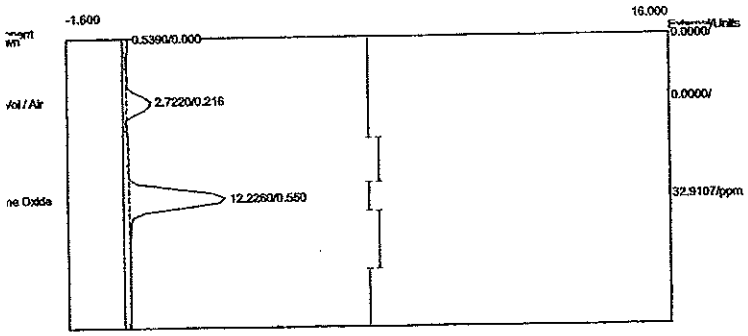
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.9800	0.0000	
ylene Oxide	0.550	11.4790	30.8999	ppm
		14.4590	30.8999	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:12:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



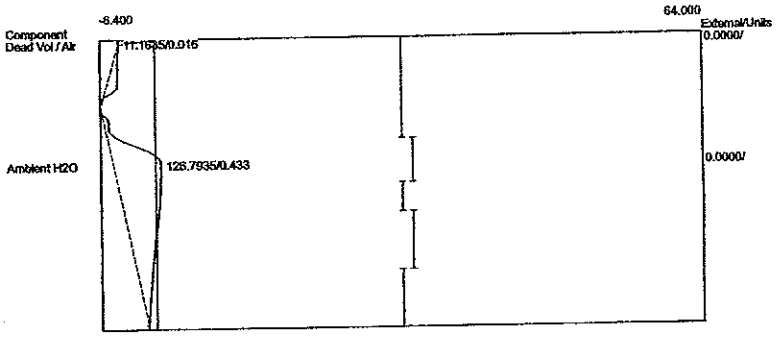
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	11.6880	0.0000	
Ambient H2O	0.450	126.9770	0.0000	
		138.6650	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
alysis date: 10/24/2014 12:17:39
Method: Direct Injection
)escription: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
prog: eto-100.tem
)nents: eto1-100.cpt
Data file: 1SterGA2014-3A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



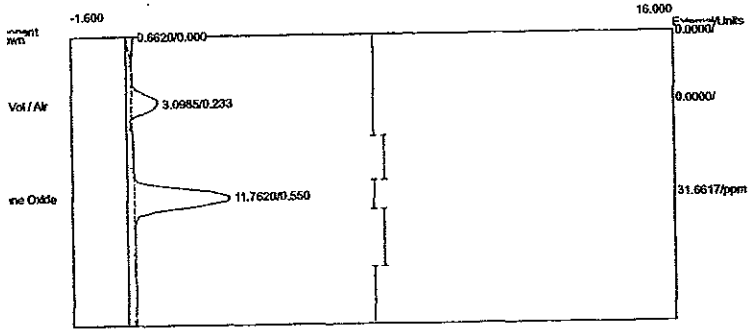
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.7220	0.0000	
ylene Oxide	0.550	12.2260	32.9107	ppm
		14.9480	32.9107	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:17:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



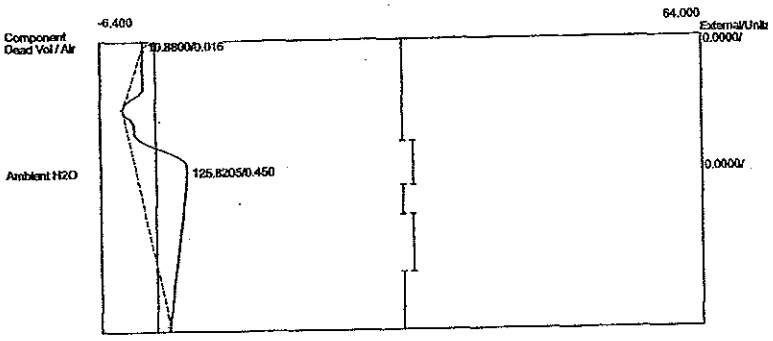
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	11.1635	0.0000	
Ambient H2O	0.433	126.7935	0.0000	
		137.9570	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 12:22:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
›. prog: eto-100.tem
ɔnents: eto1-100.cpt
Data file: 1SterGA2014-3A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



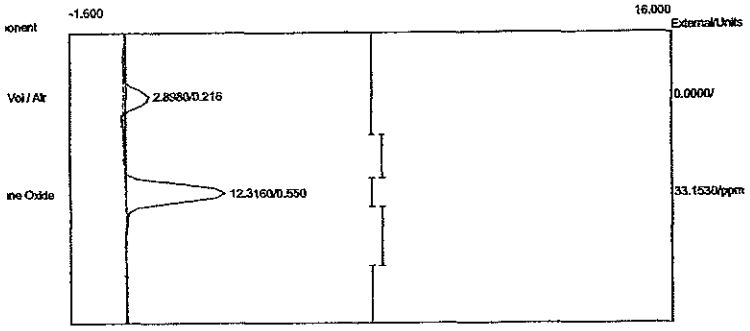
Component	Retention	Area	External	Units
ad Vol / Air	0.233	3.0985	0.0000	
ylene Oxide	0.550	11.7620	31.6617	ppm
		14.8605	31.6617	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:22:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



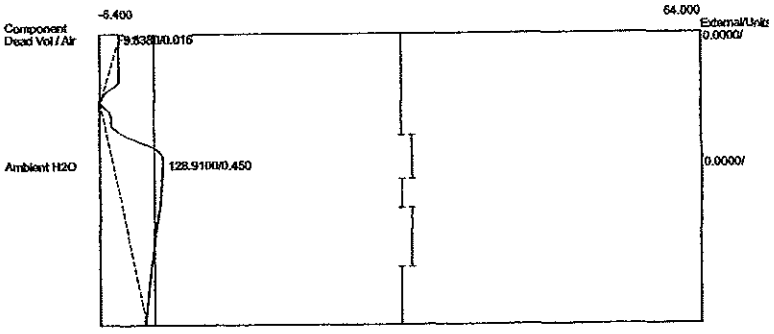
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	10.8800	0.0000	
Ambient H2O	0.450	125.8205	0.0000	
		136.7005	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 12:27:19
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-3A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



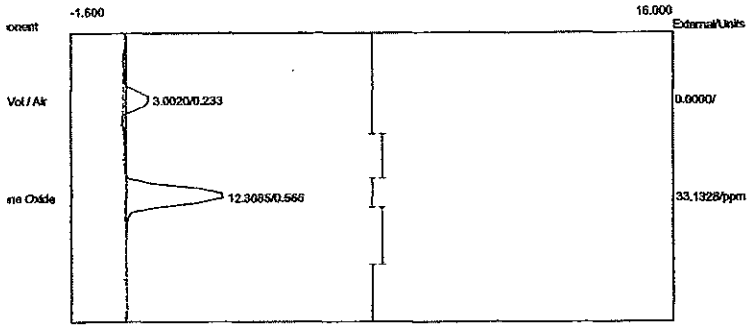
Component	Retention	Area	External	Units
ad Vol / Air	0.216	2.8980	0.0000	
ıylene Oxide	0.550	12.3160	33.1530	ppm
		15.2140	33.1530	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:27:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



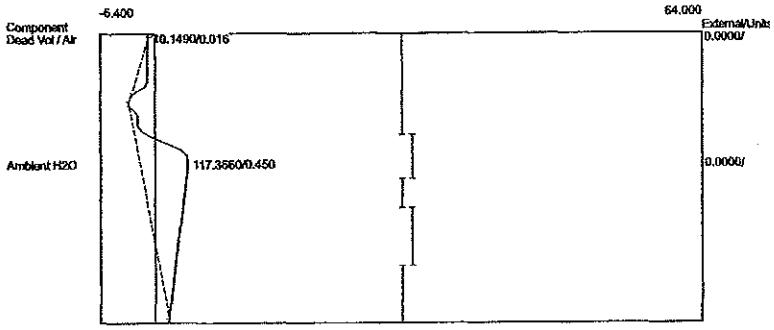
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	9.8380	0.0000	
Ambient H2O	0.450	128.9100	0.0000	
		138.7480	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
ıalysis date: 10/24/2014 12:32:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
onents: eto1-100.cpt
Data file: 1SterGA2014-3A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



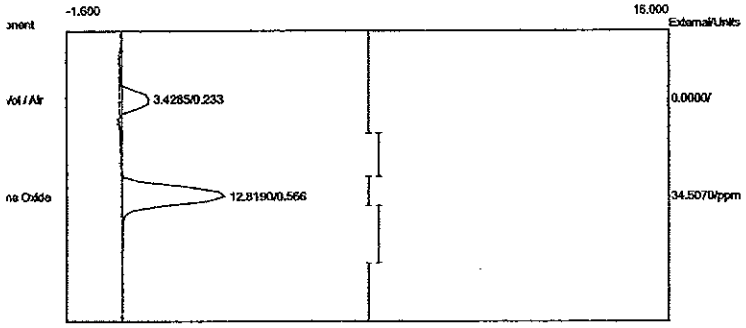
Component	Retention	Area	External	Units
ad Vol / Air	0.233	3.0020	0.0000	
ylene Oxide	0.566	12.3085	33.1328	ppm
		15.3105	33.1328	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:32:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



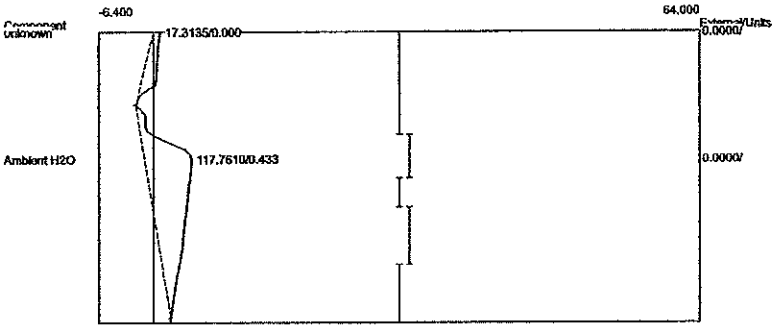
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	10.1490	0.0000	
Ambient H2O	0.450	117.3660	0.0000	
		127.5150	0.0000	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
alysis date: 10/24/2014 12:37:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
. prog: eto-100.tem
nents: eto1-100.cpt
Data file: 1SterGA2014-3A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	3.4285	0.0000	
ylene Oxide	0.566	12.8190	34.5070	ppm
		16.2475	34.5070	

Client: Sterigenics - Smyrna, GA
Client ID: Run#3Aer
Analysis date: 10/24/2014 12:37:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGA2014-3A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.433	117.7610	0.0000	
		117.7610	0.0000	

APPENDIX E

Field Data and Calculation Worksheets

ECSi

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations - Aeration

Sterigenics, Inc. - Smyrna, Georgia - October 24, 2014
AAT Safe Cell System

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.37	0.6083	91	0.02
0.37	0.6083	91	0.01
0.37	0.6083	91	0.03
0.37	0.6083	91	0.01
0.37	0.6083	91	0.03
0.37	0.6083	91	0.01
0.37	0.6083	92	0.04
0.37	0.6083	92	0.01
0.37	0.6083	92	0.01
0.37	0.6083	92	0.01
0.37	0.6083	92	0.01
0.37	0.6083	92	0.01
	Run #2		
0.37	0.6083	92	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
0.37	0.6083	93	0.01
	Run #3		
0.37	0.6083	93	0.01
0.37	0.6083	94	0.01
0.37	0.6083	94	0.01
0.37	0.6083	94	0.01
0.37	0.6083	94	0.01
0.37	0.6083	94	0.01
0.37	0.6083	95	0.01
0.37	0.6083	95	0.01
0.37	0.6083	95	0.01
0.37	0.6083	95	0.01
0.37	0.6083	95	0.01
0.37	0.6083	95	0.01
Average =			
0.37	0.6083	92.9	**0.0122**
		= 553	degR

stack ID =	28	in.
stack area =	4.276	sq. in.
press =	29.20	in. Hg
Tstd =	528	deg R
Pstd =	29.92	in Hg
Cp =	0.99	
Kp =	85.49	
Velocity =	42.0	ft/sec
Flow =	**9831**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000014**	**lbs/min**
EtO Mass Flow =	**0.000824**	**lbs/hr**

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: Sterigenics-Smyrna, GA

Source Tested: Ceilcote Packed Power Scrubber and an AAT Safe Cell system

Date: 10/23-24/14

PRE CALIBRATION

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
Inlet (FID)	Area Counts #1	.40	3.77	372					
	Area Counts #2	.41	3.73	377					
	Average Area	.405	3.75	375					
	Audit Standard (48.8 ppmv) Result					49.1 ✓			

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
Outlet (PID)	Area Counts #1	1.93	18.4	181					
	Area Counts #2	1.87	18.6	181					
	Average Area	1.90	18.5	181					
	Audit Standard (48.8 ppmv) Result					49.3 ✓			

	Ch.1	Ch.8	Ch.10			
	Run #1	Run #2	Run #3			
Ceilcote start/stop:	1335/1357	1413/1435	1531/1548	P_{bar}:	29.20	EtO Usage (lbs/yr): —
AAT start/stop:	940/1040	1040/1140	1140/1240	$\%H_2O$:	3	Cycles Per Week: —

POST CALIBRATION

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
Inlet (FID)	Area Counts #1			✓		✓	✓	✓	
	Area Counts #2		✓						
	Average Area					10/23/14 PM	10/24/14 AM	10/24/14 PM	
	Audit Standard (48.8 ppmv) Result					48.8	48.6	48.5	

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
Outlet (PID)	Area Counts #1			✓		✓	✓	✓	
	Area Counts #2		✓						
	Average Area					10/23/14 PM	10/24/14 AM	10/24/14 PM	
	Audit Standard (48.8 ppmv) Result					48.8	48.8	48.9	

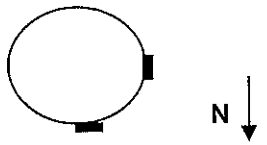
ECSi

ECSI, INC. - VELOCITY TRAVERSE DATA

Client: Sterigenics, Inc. Run #: 1 Date: 10/24/2014 Port Sketch:

Location: Smyrna, Georgia Probe Type: Std. Baro Press: 29.20

Source: AAT Safe Cell System Outlet Stack I.D.: 28 in. DSCFM: 9860



	Port 1							Port 2						
Inches From Port	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle
0.6	1	0.35	0.35	0.35	0.5916	90	0	1	0.35	0.35	0.35	0.5916	90	0
1.8	2	0.35	0.36	0.355	0.5958	90	0	2	0.35	0.36	0.355	0.5958	90	0
3.2	3	0.36	0.36	0.36	0.6000	90	0	3	0.36	0.36	0.36	0.6000	90	0
5.0	4	0.37	0.37	0.37	0.6083	90	0	4	0.36	0.37	0.365	0.6042	90	0
7.0	5	0.38	0.38	0.38	0.6164	90	0	5	0.37	0.37	0.37	0.6083	90	0
10.0	6	0.39	0.39	0.39	0.6245	90	0	6	0.38	0.39	0.385	0.6205	90	0
18.0	7	0.39	0.39	0.39	0.6245	91	0	7	0.39	0.39	0.39	0.6245	90	0
21.0	8	0.38	0.38	0.38	0.6164	91	0	8	0.38	0.39	0.385	0.6205	91	0
23.0	9	0.37	0.38	0.375	0.6124	91	0	9	0.38	0.38	0.38	0.6164	91	0
24.8	10	0.36	0.37	0.365	0.6042	91	0	10	0.37	0.38	0.375	0.6124	91	0
26.2	11	0.35	0.36	0.355	0.5958	91	0	11	0.36	0.37	0.365	0.6042	91	0
28.4	12	0.35	0.35	0.35	0.5916	91	0	12	0.36	0.36	0.36	0.6000	91	0
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:			0.3692	0.6075	90.5	0.0

APPENDIX F

Gas Certifications

ECSi

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
2600 CAJON BLVD., SAN BERNARDINO, CA 92411
Phone: 909 887-2571 Fax: 909-887 0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 020200012310TCL
P.O. No.: VBL – J. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI -NC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: _____ DATE: 4-14-14

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2600 CAJON BLVD · SAN BERNARDINO CA 92411 Phone: 909-887-2571 Fax: 909-887-0543

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 020300013201CL
P.O. No.: VAL - D KREMER

Cylinder Number: CLM008232
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY _____ DATE 4-14-14

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Phone: 909-887-2571 Fax: 909 887 0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-87164-004
Item No.: 02020001330TCL
P.O. No.: VB.,-D KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

BCSL INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: [signature] BCM

DATE 4-14-14

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

Phone: 909 887 2571 Fax: 909 887 0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL - D. KREMER

Cylinder Number: CLM003810
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 846
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: ________ RM

DATE: 4-14-14

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
2600 CAJON BLVD SAN BERNARDINO CA 92411
Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57184-006
Item No.: 02020001340TCL
P.O. No.: VBL – D KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

SCSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.080	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: [signature] BLM

DATE: 4-14-14

CERTIFICATE OF ANALYSIS

Customer Name:	[illegible] Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Scrubber Unit	**Cylinder - Contents[1]:**	58 CF @ 2000 PSIG
MESA Reference:	[illegible]	**Cylinder-CGA:**	[illegible]
Date of Certification:	[illegible]	**Analysis Method:**	[illegible]
Recommended Shelf Life:	[illegible]	**Preparation Method:**	[illegible]

Component	Requested Concentration[2]	Reported Concentration[2,3]
[illegible]	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature: [illegible]

[illegible]

1. [illegible]
2. [illegible]

[illegible]

MESA Specialty Gases & Equipment
[illegible]
[illegible] ★ [illegible] ★ FAX: [illegible] ★ [illegible]
[illegible]

APPENDIX G

Parametric Monitoring Data

ECSi

Sterigenics UNCONTROLLED COPY

Weekly Scrubber Preventive Maintenance

SCRUBBER DOWN TIME IS NOT REQUIRED

Scrubber Type: AAT Number/Location: EC2

	Description		Inspectors Initials/Date
1	Check and record flow rate to Absorption Tower. Flow Rate = 1537 **Note: Acceptable Flow ranges - Environmental permit may dictate.**	OK☑ N/A☐ C/A☐	24 Oct 14
2	Perform alarm light test.	OK☑ N/A☐ C/A☐	24 Oct 14
3	Check the scrubber liquor and record the following values: • Storage Tank level 108 In or Gal **(If liquor is shipped for recycling, record in MP2)** • 0.9 pH **(Range ~ 0.5 to 1.0; Environmental permit may dictate)** • Inlet Temperature 72 °F N/A☐ - System does not monitor this parameter • Outlet Temperature 82 °F N/A☐ - System does not monitor this parameter **Note: Acceptable ranges - Environmental permit may dictate. System capabilities determine parameters.**	OK☑ N/A☐ C/A☐	24 Oct 14
4	Check all pumps, pipes, seals, and rings for leaks.	OK☑ N/A☐ C/A☐	24 Oct 14
5	Check pressure relief valve for leaks or discharge.	OK☑ N/A☐ C/A☐	24 Oct 14
6	Record Glycol concentration 30.4 %. **Note: Ensure concentration does NOT exceed permit conditions.**	OK☑ N/A☐ C/A☐	24 Oct 14
7	Check scrubber EO Levels. Wet scrubber outlet/dry bed inlet 0.00 PPM EO (High flow system only) Dry bed outlet 0.00 PPM EO **Note: If dry bed outlet concentration reaches permitted maximum levels make the necessary arrangements for dry bed absorbent replacement.**	OK☑ N/A☐ C/A☐	24 Oct 14

Instructions:

- Write the scrubber type and number/location on the line provided above.
- If the inspection shows the item does not need further inspection or attention then mark the [OK] Checkbox.
- If a particular equipment item is not present, the inspector will mark the [N/A] Checkbox.
- If corrective action is required, mark the [C/A] Checkbox and then record the corrective action or Work Order # below.
- Work Order number must be recorded below whenever possible.

CA - Corrective Action: (Include item #, and action, i.e. W.O # or other)

Reviewed by: [signature] Date: 24-Oct-14