Trinity Consultants
15 E Salem Ave, Ste 201, Roanoke, VA 24011 / P 540.342.5945 / F 540.301.4922 / **trinityconsultants.com**

VIA E-MAIL: andrea.wortzel@troutman.com

December 10, 2021

Ms. Andrea Wortzel, Esq.
Partner
Troutman Pepper
Troutman Pepper Building
1001 Haxall Point
Richmond, VA 23219

RE: Air Sampling at Bristol, Virginia Solid Waste Management Facility

Dear Ms. Wortzel:

Trinity Consultants (Trinity) appreciates the opportunity to conduct air sampling at the Bristol, Virginia Solid Waste Management Facility (landfill). This letter provides a summary of the sampling performed. Attachments to this letter include the laboratory results for all of the sampling.

CHRONOLOGY

On Tuesday November 16, 2021, two staff from Trinity performed ambient air sampling at the landfill.

Russell Bailey and Keegan Waggener from Trinity met two individuals at the entrance to the landfill at approximately 0550. Ernie Hoch of Draper Aden was our host, and we understand that Draper Aden is providing ongoing services to the landfill. Zach Priester of HDR was there as an observer; we understand that HDR was hired by Bristol VA as a 3rd party observer to the sampling performed.

Trinity discussed its desired sampling goals and locations for the day with the landfill representatives. Because one target location was at the active face, Mr. Hoch requested that we sample at that location later in the morning when visibility was better for safety reasons (sunrise was not until 0706 and the active face was well below grade in the quarry, further limiting light).

A map in Attachment 1 shows the approximate locations sampled. The map is based on the current aerial photo on the Bristol VA GIS (https://bristolva.interactivegis.com/map/) as of 12/9/2021. Given that the southern end of the landfill is the active fill area, the area as represented in the aerial photo does not accurately show the working face or the topography during the onsite sampling; however, the aerial photo does show the approximate locations of each sampling location. Trinity has separately provided detailed pictures and videos taken while onsite to show the conditions at the time of the sampling.

The five locations in the order sampled are listed following:

1. Leachate tank
2. "Existing" Landfill (mislabeled as "exiting" in some lab results)
3. Compost area
4. Hot wells
5. Chimney

Detailed sampling times are provided in the laboratory reports. In general, the actual sampling required approximately one hour from arrival at a location until departing that location, with the exception of the hot wells which required approximately four hours due to collecting a 13A sample at that location.

Mr. Hoch came and went during the sampling, visiting sample locations 1, 2, and 4. Mr. Hoch stayed in communication via text with Trinity during the time onsite.

Mr. Priester stayed with Trinity during the entire time onsite and observed the testing.

TESTS AND EQUIPMENT

The following tests were completed.

- Method TO-15: Toxic Organic Compounds – full, quantifiable, list of specific VOCs and Hazardous Air Pollutants
- Method 3C: Hydrogen, Nitrogen, Oxygen, Carbon Monoxide, Carbon Dioxide, and Methane
- Method 15/16: Hydrogen Sulfide and other select sulfides and mercaptans.
- Method TO-11A: Formaldehyde
- Method TO-13A: Polycyclic Aromatic Hydrocarbons (PAHs)

All but the TO-13A test was performed at each of the five locations. The TO-13A test was only performed at Location 4, the hot wells.

The TO-15 and Method 3C samples were collected in six-liter canisters, each with a calibrated flow controller to regulate the sample flow rate. Vacuum on each cannister was recorded at the start and end of each sample.

The Method 15/16 samples were collected in tedlar bags and filled via a pump. At each location, the tedlar bag was filled and emptied three times before filling it a fourth time for the sample to be analyzed.

The TO-13A and TO-11A samples were collected in laboratory-prepared cartridge (TO-13A) or tube (TO-11A) designed for the aforementioned analytes/methods. The TO-11A samples used a DNPH tube and an AirChek TOUCH pump. Prior to commencing the TO-11A sampling, Trinity used a calibration tube to confirm calibration of the pump. For each TO-11A sample, the pump was run for approximately 30 minutes at a rate of 1.0 liters per minute. The specific times were as follows

- Leachate tank – 30.00 minutes
- Existing landfill – 30.15 minutes
- Compost area – 30.18 minutes
- Hot wells – 30.75 minutes
- Chimney – 30.02 minutes

The TO-13A sample was only performed at the hot well location, and used a TE-1000 PUF sampler, which is a traditional HiVol sampler with a special head to hold the PUF cartridge. A TE-5040 PUF calibration kit was

also used; the calibration kit uses a calibrated orifice and the voltage control to set the full flow at a magnehelic value of approximately 70 inches of water. Trinity set the calibration initially at approximately 0645 while sampling was underway at Site 1 (leachate). At the conclusion of the Site 4 TO-13A sampling, Trinity performed a full calibration using the flow venturi and calibration valve on the HiVol to vary airflow and recording differential pressures with the provided manometer; note that the full flow (calibration valve open) value at the hot wells was slightly lower at approximately 68 inches of water during the post-sampling calibration. Using the field calibration data together with the certification data from Tisch, the total volume of air pulled through the sampling cartridge is calculated. The field calibration sheet as well as the Tisch calibration kit certification are provided in Attachment 1.

SAMPLE ANALYSIS

At the conclusion of the testing, Trinity coordinated shipment of the samples to Enthalpy for analysis. For all samples but the TO-13A sample, Trinity delivered them to an Enthalpy courier in Wytheville, Virginia at approximately 1900 that evening. The TO-13A sample packed in a cooler was transferred to a FedEx driver at approximately 1715 in Bristol, Virginia.

Enthalpy analyzed all of the samples. The lab reports from the sampling are provided in Attachment 2 (3C, 15/16, TO-11A) and Attachment 3 (TO-15, TO-13A).

~ ~ ~

Thank you for the opportunity to assist with this sampling. If you have any questions or would like to discuss, please feel free to call me at 540-904-7417 or email at rbailey@trinityconsultants.com.

Sincerely,

TRINITY CONSULTANTS

J. Russell Bailey III
Principal Consultant

ATTACHMENT 1

Site Sampling Locations
TO-13A Flow Calculation


425-1-12G
162
485
1
VALLEY DR
2128
2880
VALLEY DR
2871
2
425-A-4
210
741
257
1000
LANDFILL RD
425-A-5
4
5
425-2-7
287
3
124
465-A-1

TISCH Environmental

RECALIBRATION DUE DATE:
October 4, 2022

Certificate of Calibration

Calibration Certification Information					
Cal. Date:	October 4, 2021	**Rootsmeter S/N:** 438320	**Ta:** 296	°K	
Operator:	Jim Tisch		**Pa:** 751.6	mm Hg	
Calibration Model #:	TE-5040A	**Calibrator S/N:** 3970			

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	6.567	3.60	2.00
2	3	4	1	3.989	10.10	5.50
3	5	6	1	3.207	15.60	8.50
4	7	8	1	2.733	21.10	11.50
5	9	10	1	2.42	26.60	14.50
6	11	12	1	2.264	30.30	16.50

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9908	0.1509	1.4111	0.9952	0.1515	0.8875
0.9822	0.2462	2.3401	0.9866	0.2473	1.4718
0.9749	0.3040	2.9091	0.9792	0.3053	1.8296
0.9677	0.3541	3.3837	0.9719	0.3556	2.1282
0.9604	0.3968	3.7995	0.9646	0.3986	2.3897
0.9555	0.4220	4.0531	0.9597	0.4239	2.5492
QSTD	**m=**	**9.72365**	**QA**	**m=**	**6.08879**
	b=	**-0.05437**		**b=**	**-0.03419**
	r=	**0.99999**		**r=**	**0.99999**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

TE-1000 PUF Calibration Worksheet

Site Information

Sampler:	TE-1000 PUF	**Serial No:** 1116	**Date:** 16-Nov-21
			Tech: Russell Bailey

Calibration and Site Conditions

Calibration Barometric Pressure (in Hg):	29.59	**Calibration Corrected Pressure (mm Hg):**	751.6
Calibration Temperature (deg F):	73.1	**Calibration Temperature (deg K):**	296.0
Site Average Pressure (in Hg):	30.18	**Site Corrected Average Pressure (mm Hg):**	766.6
Site Average Temperature (deg F):	44.0	**Site Average Temperature (deg K):**	279.8

Calibration Orifice

Make:	Tisch	**Qstd Slope:**	9.72365
Model:	TE-5040A	**Qstd Intercept:**	-0.05437
Serial#:	3970	**Calibration Date:**	4-Oct-21

Calibration Information

Plate or Test #	Pressure (in H_20)	Qstd (m3/min)	Flow (magn)	Flow (corrected)
1	7.00	0.277	68.0	8.23
2	6.50	0.267	60.0	7.73
3	5.50	0.246	50.0	7.06
4	4.50	0.223	40.0	6.31
5	3.50	0.198	30.0	5.47
6	2.50	0.168	20.0	4.46

Linear Regression

Slope: 33.7225
Intercept: -1.2101
Corr. Coeff: 0.9992

# of Observations: 6

Calculations

Qstd = 1/m[Sqrt((H20)(Pa/760)(298/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading from magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
Qstd = 1/m[Sqrt((H20)(Pa/760)(298/Ta))-b]

m = sampler slope
b = sampler intercept
(magn) = magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Average Flow (magn): 25.0
Average Flow Over Sample (m3/min)
0.189554
Enter Total Time (hrs): 3.0
Total Flow Over Sample (m3)
34.11974828
Total Flow Over Sample (liters)
34119.74828

NOTE: Ensure calibration orifice has been certified within 12 months of use

Attachment 2

Enthalpy Report
Methods 3C, 15/16, TO-11A

Trinity Consultants Inc.

4525 Wasatch Blvd, Suite 200
Salt Lake City, UT 84124

Bristol Landfill

Analytical Report
(1121-078A)

EPA Method 15/16

Hydrogen sulfide, Carbon disulfide, Carbonyl sulfide, Methyl mercaptan, Dimethyl disulfude, Dimethyl sulfide

EPA Method 3C

Hydrogen, Oxygen, Nitrogen, Carbon monoxide, Methane, Carbon dioxide

EPA Method TO-11A

Formaldehyde

Enthalpy Analytical, LLC

Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / www.enthalpy.com
800-1 Capitola Drive Durham, NC 27713-4385

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 222 pages.

QA Review Performed by – Jennifer Bowker

Report Issued: 12/8/2021

ENTHALPY ANALYTICAL

Summary of Results

Enthalpy Analytical

Company: Trinity Consultants Inc

Job No.: 1121-078 EPA Method 15/16 Analysis

Client No.: 214701.0071 Site: Bristol Landfill

Summary

Compound	Sample ID / Concentration (ppmv)				
	Compost (Tedlar -3)	Hot Wells (Tedlar -4)	Exiting (Tedlar -2)	Leachate (Tedlar -1)	Chimney (Tedlar -5)
Hydrogen sulfide	0.117 ND	0.117 ND	0.117 ND	0.117 ND	0.117 ND
Carbonyl sulfide	0.0960 ND	0.0960 ND	0.0960 ND	0.0960 ND	0.0960 ND
Methyl mercaptan	0.105 ND	0.105 ND	0.105 ND	0.105 ND	0.105 ND
Dimethyl sulfide	0.112 ND	0.112 ND	0.112 ND	0.112 ND	0.112 ND
Carbon disulfide	0.0587 ND	0.0587 ND	0.0587 ND	0.0587 ND	0.0587 ND
Dimethyl disulfide	0.0477 ND	0.0477 ND	0.0477 ND	0.0477 ND	0.0477 ND

Enthalpy Analytical

Company: Trinity Consultants Inc

Job No.: 1121-078 EPA Method 3C (Canister)

Client No.: # 214701.0071 Site: Bristol Landfill

Summary

Sample ID / Concentration (%)

Compound	Chimney (Can #0072)	Compost (Can #0799)	Exiting (Can #0763)	Hot Wells (Can #1734)	Leachate (Can #R5091)
Hydrogen	0.400 ND	0.293 ND	0.350 ND	0.378 ND	0.340 ND
Oxygen	21.4	20.9	23.0	21.5	21.3
Nitrogen	82.0	81.2	89.2	82.6	82.1
Carbon monoxide	0.225 ND	0.165 ND	0.197 ND	0.212 ND	0.191 ND
Methane	0.179 ND	0.132 ND	0.157 ND	0.170 ND	0.152 ND
Carbon dioxide	0.317 ND	0.233 ND	0.278 ND	0.300 ND	0.270 ND

Enthalpy Analytical

Company: Trinity Consultants, Inc.
Job No.: 1121-078 - EPA Method TO-11A
Site: Bristol Landfill

Summary Table

Catch Weight (ug)

Sample Train Name	Formaldehyde	
Compost - (DNPH-3)	0.105	J
Hot Wells Active (DNPH-4)	0.189	J
Existing Landfill (498) - (DNPH-2)	0.113	J
Leachate Tank - (DNPH-1)	0.113	J
Chimney - (DNPH-5)	0.167	J

Results

Enthalpy Analytical

Company: Trinity Consultants Inc

Job No.: 1121-078 EPA Method 15/16 Analysis

Client No.: 214701.0071 Site: Bristol Landfill

Hydrogen sulfide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (ppmvv)	Curve Min. (ppmvv)	Curve Max. (ppmvv)	Ret. Time (min.)	Ret. Time (min.)	Ret. Time (min.)	%dif. RT	Conc. #1 (ppmvv)	Conc. #2 (ppmvv)	Conc. #3 (ppmvv)	%dif. conc.	Avg. Conc. (ppmvv)	DF	Sample Conc. (ppmvv)	Flag
Compost (Tedlar -3)	005B1901.D	005B1902.D	005B1903.D	0.117	1.18	10.2	NA	NA	NA	NA	0.117	0.117	0.117	0.0	0.117	1	0.117	ND
Hot Wells (Tedlar -4)	005B1801.D	005B1802.D	005B1803.D	0.117	1.18	10.2	NA	NA	NA	NA	0.117	0.117	0.117	0.0	0.117	1	0.117	ND
Exiting (Tedlar -2)	005B2201.D	005B2202.D	005B2203.D	0.117	1.18	10.2	NA	NA	NA	NA	0.117	0.117	0.117	0.0	0.117	1	0.117	ND
Leachate (Tedlar -1)	005B2101.D	005B2102.D	005B2103.D	0.117	1.18	10.2	NA	NA	NA	NA	0.117	0.117	0.117	0.0	0.117	1	0.117	ND
Chimney (Tedlar -5)	005B2001.D	005B2002.D	005B2003.D	0.117	1.18	10.2	NA	NA	NA	NA	0.117	0.117	0.117	0.0	0.117	1	0.117	ND

Carbonyl sulfide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (ppmvv)	Curve Min. (ppmvv)	Curve Max. (ppmvv)	Ret. Time (min.)	Ret. Time (min.)	Ret. Time (min.)	%dif. RT	Conc. #1 (ppmvv)	Conc. #2 (ppmvv)	Conc. #3 (ppmvv)	%dif. conc.	Avg. Conc. (ppmvv)	DF	Sample Conc. (ppmvv)	Flag
Compost (Tedlar -3)	005B1901.D	005B1902.D	005B1903.D	0.0960	0.585	5.05	NA	NA	NA	NA	0.0960	0.0960	0.0960	0.0	0.0960	1	0.0960	ND
Hot Wells (Tedlar -4)	005B1801.D	005B1802.D	005B1803.D	0.0960	0.585	5.05	NA	NA	NA	NA	0.0960	0.0960	0.0960	0.0	0.0960	1	0.0960	ND
Exiting (Tedlar -2)	005B2201.D	005B2202.D	005B2203.D	0.0960	0.585	5.05	NA	NA	NA	NA	0.0960	0.0960	0.0960	0.0	0.0960	1	0.0960	ND
Leachate (Tedlar -1)	005B2101.D	005B2102.D	005B2103.D	0.0960	0.585	5.05	NA	NA	NA	NA	0.0960	0.0960	0.0960	0.0	0.0960	1	0.0960	ND
Chimney (Tedlar -5)	005B2001.D	005B2002.D	005B2003.D	0.0960	0.585	5.05	NA	NA	NA	NA	0.0960	0.0960	0.0960	0.0	0.0960	1	0.0960	ND

Methyl mercaptan

Sample ID	Filename #1	Filename #2	Filename #3	MDL (ppmvv)	Curve Min. (ppmvv)	Curve Max. (ppmvv)	Ret. Time (min.)	Ret. Time (min.)	Ret. Time (min.)	%dif. RT	Conc. #1 (ppmvv)	Conc. #2 (ppmvv)	Conc. #3 (ppmvv)	%dif. conc.	Avg. Conc. (ppmvv)	DF	Sample Conc. (ppmvv)	Flag
Compost (Tedlar -3)	005B1901.D	005B1902.D	005B1903.D	0.105	1.33	11.4	NA	NA	NA	NA	0.105	0.105	0.105	0.0	0.105	1	0.105	ND
Hot Wells (Tedlar -4)	005B1801.D	005B1802.D	005B1803.D	0.105	1.33	11.4	NA	NA	NA	NA	0.105	0.105	0.105	0.0	0.105	1	0.105	ND
Exiting (Tedlar -2)	005B2201.D	005B2202.D	005B2203.D	0.105	1.33	11.4	NA	NA	NA	NA	0.105	0.105	0.105	0.0	0.105	1	0.105	ND
Leachate (Tedlar -1)	005B2101.D	005B2102.D	005B2103.D	0.105	1.33	11.4	NA	NA	NA	NA	0.105	0.105	0.105	0.0	0.105	1	0.105	ND
Chimney (Tedlar -5)	005B2001.D	005B2002.D	005B2003.D	0.105	1.33	11.4	NA	NA	NA	NA	0.105	0.105	0.105	0.0	0.105	1	0.105	ND

Enthalpy Analytical

Company: Trinity Consultants Inc

Job No.: 1121-078 EPA Method 15/16 Analysis

Client No.: 214701.0071 Site: Bristol Landfill

Dimethyl sulfide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (ppmvv)	Curve Min. (ppmvv)	Curve Max. (ppmvv)	Ret. Time (min.)	Ret. Time (min.)	Ret. Time (min.)	%dif. RT	Conc. #1 (ppmvv)	Conc. #2 (ppmvv)	Conc. #3 (ppmvv)	%dif. conc.	Avg. Conc. (ppmvv)	DF	Sample Conc. (ppmvv)	Flag
Compost (Tedlar -3)	005B1901.D	005B1902.D	005B1903.D	0.112	1.06	9.10	NA	NA	NA	NA	0.112	0.112	0.112	0.0	0.112	1	0.112	ND
Hot Wells (Tedlar -4)	005B1801.D	005B1802.D	005B1803.D	0.112	1.06	9.10	NA	NA	NA	NA	0.112	0.112	0.112	0.0	0.112	1	0.112	ND
Exiting (Tedlar -2)	005B2201.D	005B2202.D	005B2203.D	0.112	1.06	9.10	NA	NA	NA	NA	0.112	0.112	0.112	0.0	0.112	1	0.112	ND
Leachate (Tedlar -1)	005B2101.D	005B2102.D	005B2103.D	0.112	1.06	9.10	NA	NA	NA	NA	0.112	0.112	0.112	0.0	0.112	1	0.112	ND
Chimney (Tedlar -5)	005B2001.D	005B2002.D	005B2003.D	0.112	1.06	9.10	NA	NA	NA	NA	0.112	0.112	0.112	0.0	0.112	1	0.112	ND

Carbon disulfide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (ppmvv)	Curve Min. (ppmvv)	Curve Max. (ppmvv)	Ret. Time (min.)	Ret. Time (min.)	Ret. Time (min.)	%dif. RT	Conc. #1 (ppmvv)	Conc. #2 (ppmvv)	Conc. #3 (ppmvv)	%dif. conc.	Avg. Conc. (ppmvv)	DF	Sample Conc. (ppmvv)	Flag
Compost (Tedlar -3)	005B1901.D	005B1902.D	005B1903.D	0.0587	0.663	5.71	NA	NA	NA	NA	0.0587	0.0587	0.0587	0.0	0.0587	1	0.0587	ND
Hot Wells (Tedlar -4)	005B1801.D	005B1802.D	005B1803.D	0.0587	0.663	5.71	NA	NA	NA	NA	0.0587	0.0587	0.0587	0.0	0.0587	1	0.0587	ND
Exiting (Tedlar -2)	005B2201.D	005B2202.D	005B2203.D	0.0587	0.663	5.71	NA	NA	NA	NA	0.0587	0.0587	0.0587	0.0	0.0587	1	0.0587	ND
Leachate (Tedlar -1)	005B2101.D	005B2102.D	005B2103.D	0.0587	0.663	5.71	NA	NA	NA	NA	0.0587	0.0587	0.0587	0.0	0.0587	1	0.0587	ND
Chimney (Tedlar -5)	005B2001.D	005B2002.D	005B2003.D	0.0587	0.663	5.71	NA	NA	NA	NA	0.0587	0.0587	0.0587	0.0	0.0587	1	0.0587	ND

Dimethyl disulfide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (ppmvv)	Curve Min. (ppmvv)	Curve Max. (ppmvv)	Ret. Time (min.)	Ret. Time (min.)	Ret. Time (min.)	%dif. RT	Conc. #1 (ppmvv)	Conc. #2 (ppmvv)	Conc. #3 (ppmvv)	%dif. conc.	Avg. Conc. (ppmvv)	DF	Sample Conc. (ppmvv)	Flag
Compost (Tedlar -3)	005B1901.D	005B1902.D	005B1903.D	0.0477	0.201	1.74	NA	NA	NA	NA	0.0477	0.0477	0.0477	0.0	0.0477	1	0.0477	ND
Hot Wells (Tedlar -4)	005B1801.D	005B1802.D	005B1803.D	0.0477	0.201	1.74	NA	NA	NA	NA	0.0477	0.0477	0.0477	0.0	0.0477	1	0.0477	ND
Exiting (Tedlar -2)	005B2201.D	005B2202.D	005B2203.D	0.0477	0.201	1.74	NA	NA	NA	NA	0.0477	0.0477	0.0477	0.0	0.0477	1	0.0477	ND
Leachate (Tedlar -1)	005B2101.D	005B2102.D	005B2103.D	0.0477	0.201	1.74	NA	NA	NA	NA	0.0477	0.0477	0.0477	0.0	0.0477	1	0.0477	ND
Chimney (Tedlar -5)	005B2001.D	005B2002.D	005B2003.D	0.0477	0.201	1.74	NA	NA	NA	NA	0.0477	0.0477	0.0477	0.0	0.0477	1	0.0477	ND

Enthalpy Analytical

Company: Trinity Consultants Inc

Job No.: 1121-078 EPA Method 3C (Canister)

Client No.: # 214701.0071 Site: Bristol Landfill

Hydrogen

Sample ID	Filename #1	Filename #2	Filename #3	MDL (%)	Curve Min (%)	Curve Max (%)	Ret Time (min)	Ret Time (min)	Ret Time (min)	%dif RT	Conc #1 (%)	Conc #2 (%)	Conc #3 (%)	%dif conc	Avg Conc (%)	DF * Can Press.	Final Conc (%)	Flag
Chimney (Can #0072)	013F0501.D	013F0502.D	013F0503.D	0.0807	0.596	30.4	NA	NA	NA	NA	0.0807	0.0807	0.0807	0.0	0.0807	4.958	0.400	ND
Compost (Can #0799)	004F0101.D	004F0102.D	004F0103.D	0.0807	0.596	30.4	NA	NA	NA	NA	0.0807	0.0807	0.0807	0.0	0.0807	3.634	0.293	ND
Exiting (Can #0763)	007F0301.D	007F0302.D	007F0303.D	0.0807	0.596	30.4	NA	NA	NA	NA	0.0807	0.0807	0.0807	0.0	0.0807	4.343	0.350	ND
Hot Wells (Can #1734)	005F0201.D	005F0202.D	005F0203.D	0.0807	0.596	30.4	NA	NA	NA	NA	0.0807	0.0807	0.0807	0.0	0.0807	4.685	0.378	ND
Leachate (Can #R5091)	008F0401.D	008F0402.D	008F0403.D	0.0807	0.596	30.4	NA	NA	NA	NA	0.0807	0.0807	0.0807	0.0	0.0807	4.211	0.340	ND

Oxygen

Sample ID	Filename #1	Filename #2	Filename #3	MDL (%)	Curve Min (%)	Curve Max (%)	Ret Time (min)	Ret Time (min)	Ret Time (min)	%dif RT	Conc #1 (%)	Conc #2 (%)	Conc #3 (%)	%dif conc	Avg Conc (%)	DF * Can Press.	Final Conc (%)	Flag
Chimney (Can #0072)	013F0501.D	013F0502.D	013F0503.D	0.0639	0.639	100	4.50	4.50	4.50	0.0	4.31	4.31	4.32	0.1	4.32	4.958	21.4	
Compost (Can #0799)	004F0101.D	004F0102.D	004F0103.D	0.0639	0.639	100	4.48	4.48	4.48	0.0	5.77	5.72	5.78	0.6	5.75	3.634	20.9	
Exiting (Can #0763)	007F0301.D	007F0302.D	007F0303.D	0.0639	0.639	100	4.49	4.49	4.49	0.0	5.26	5.30	5.35	0.9	5.31	4.343	23.0	
Hot Wells (Can #1734)	005F0201.D	005F0202.D	005F0203.D	0.0639	0.639	100	4.50	4.50	4.50	0.0	4.56	4.60	4.59	0.5	4.58	4.685	21.5	
Leachate (Can #R5091)	008F0401.D	008F0402.D	008F0403.D	0.0639	0.639	100	4.49	4.49	4.49	0.0	5.07	5.05	5.04	0.3	5.05	4.211	21.3	

Nitrogen

Sample ID	Filename #1	Filename #2	Filename #3	MDL (%)	Curve Min (%)	Curve Max (%)	Ret Time (min)	Ret Time (min)	Ret Time (min)	%dif RT	Conc #1 (%)	Conc #2 (%)	Conc #3 (%)	%dif conc	Avg Conc (%)	DF * Can Press.	Final Conc (%)	Flag
Chimney (Can #0072)	013F0501.D	013F0502.D	013F0503.D	0.0458	0.458	99.9	4.78	4.78	4.78	0.0	16.5	16.5	16.6	0.2	16.5	4.958	82.0	
Compost (Can #0799)	004F0101.D	004F0102.D	004F0103.D	0.0458	0.458	99.9	4.74	4.75	4.75	0.0	22.4	22.2	22.4	0.6	22.3	3.634	81.2	
Exiting (Can #0763)	007F0301.D	007F0302.D	007F0303.D	0.0458	0.458	99.9	4.76	4.76	4.76	0.0	20.4	20.5	20.7	0.9	20.5	4.343	89.2	
Hot Wells (Can #1734)	005F0201.D	005F0202.D	005F0203.D	0.0458	0.458	99.9	4.77	4.77	4.77	0.0	17.5	17.7	17.7	0.6	17.6	4.685	82.6	
Leachate (Can #R5091)	008F0401.D	008F0402.D	008F0403.D	0.0458	0.458	99.9	4.76	4.76	4.76	0.0	19.6	19.5	19.4	0.4	19.5	4.211	82.1	

Enthalpy Analytical

Company: Trinity Consultants Inc

Job No.: 1121-078 EPA Method 3C (Canister)

Client No.: # 214701.0071 Site: Bristol Landfill

Carbon monoxide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (%)	Curve Min (%)	Curve Max (%)	Ret Time (min)	Ret Time (min)	Ret Time (min)	%dif RT	Conc #1 (%)	Conc #2 (%)	Conc #3 (%)	%dif conc	Avg Conc (%)	DF * Can Press.	Final Conc (%)	Flag
Chimney (Can #0072)	013F0501.D	013F0502.D	013F0503.D	0.0453	0.453	99.5	NA	NA	NA	NA	0.0453	0.0453	0.0453	0.0	0.0453	4.958	0.225	ND
Compost (Can #0799)	004F0101.D	004F0102.D	004F0103.D	0.0453	0.453	99.5	NA	NA	NA	NA	0.0453	0.0453	0.0453	0.0	0.0453	3.634	0.165	ND
Exiting (Can #0763)	007F0301.D	007F0302.D	007F0303.D	0.0453	0.453	99.5	NA	NA	NA	NA	0.0453	0.0453	0.0453	0.0	0.0453	4.343	0.197	ND
Hot Wells (Can #1734)	005F0201.D	005F0202.D	005F0203.D	0.0453	0.453	99.5	NA	NA	NA	NA	0.0453	0.0453	0.0453	0.0	0.0453	4.685	0.212	ND
Leachate (Can #R5091)	008F0401.D	008F0402.D	008F0403.D	0.0453	0.453	99.5	NA	NA	NA	NA	0.0453	0.0453	0.0453	0.0	0.0453	4.211	0.191	ND

Methane

Sample ID	Filename #1	Filename #2	Filename #3	MDL (%)	Curve Min (%)	Curve Max (%)	Ret Time (min)	Ret Time (min)	Ret Time (min)	%dif RT	Conc #1 (%)	Conc #2 (%)	Conc #3 (%)	%dif conc	Avg Conc (%)	DF * Can Press.	Final Conc (%)	Flag
Chimney (Can #0072)	013F0501.D	013F0502.D	013F0503.D	0.0362	0.362	100	NA	NA	NA	NA	0.0362	0.0362	0.0362	0.0	0.0362	4.958	0.179	ND
Compost (Can #0799)	004F0101.D	004F0102.D	004F0103.D	0.0362	0.362	100	NA	NA	NA	NA	0.0362	0.0362	0.0362	0.0	0.0362	3.634	0.132	ND
Exiting (Can #0763)	007F0301.D	007F0302.D	007F0303.D	0.0362	0.362	100	NA	NA	NA	NA	0.0362	0.0362	0.0362	0.0	0.0362	4.343	0.157	ND
Hot Wells (Can #1734)	005F0201.D	005F0202.D	005F0203.D	0.0362	0.362	100	NA	NA	NA	NA	0.0362	0.0362	0.0362	0.0	0.0362	4.685	0.170	ND
Leachate (Can #R5091)	008F0401.D	008F0402.D	008F0403.D	0.0362	0.362	100	NA	NA	NA	NA	0.0362	0.0362	0.0362	0.0	0.0362	4.211	0.152	ND

Carbon dioxide

Sample ID	Filename #1	Filename #2	Filename #3	MDL (%)	Curve Min (%)	Curve Max (%)	Ret Time (min)	Ret Time (min)	Ret Time (min)	%dif RT	Conc #1 (%)	Conc #2 (%)	Conc #3 (%)	%dif conc	Avg Conc (%)	DF * Can Press.	Final Conc (%)	Flag
Chimney (Can #0072)	013F0501.D	013F0502.D	013F0503.D	0.0640	0.640	100	NA	NA	NA	NA	0.0640	0.0640	0.0640	0.0	0.0640	4.958	0.317	ND
Compost (Can #0799)	004F0101.D	004F0102.D	004F0103.D	0.0640	0.640	100	NA	NA	NA	NA	0.0640	0.0640	0.0640	0.0	0.0640	3.634	0.233	ND
Exiting (Can #0763)	007F0301.D	007F0302.D	007F0303.D	0.0640	0.640	100	NA	NA	NA	NA	0.0640	0.0640	0.0640	0.0	0.0640	4.343	0.278	ND
Hot Wells (Can #1734)	005F0201.D	005F0202.D	005F0203.D	0.0640	0.640	100	NA	NA	NA	NA	0.0640	0.0640	0.0640	0.0	0.0640	4.685	0.300	ND
Leachate (Can #R5091)	008F0401.D	008F0402.D	008F0403.D	0.0640	0.640	100	NA	NA	NA	NA	0.0640	0.0640	0.0640	0.0	0.0640	4.211	0.270	ND

Enthalpy Analytical -- Canister Pressurization

Job No. 1121-078
Company Trinity Consultants Inc
Site Bristol Landfill

Can Number	000072	0763	0799	1734	R5091
Job	1121-078	1121-078	1121-078	1121-078	1121-078
Sample ID	Chimney Summa -5 (000072)	Existing Landfill (498) Summa-2 (0763)	Compost Summa-3 (0799)	Hot Wells (Active) Summa-4 (1734)	Leachate Tank Summa-1 (R5091)
CleanDate	11/01/2021	11/01/2021	11/01/2021	11/01/2021	11/02/2021
LeakCheckDate	11/04/2021	11/04/2021	11/04/2021	11/04/2021	11/02/2021
LeakCheckAnalyst	aamears	aamears	aamears	aamears	aamears
BlankCheckRef	Y2103432	Y2103429	Y2103436	Y2103433	Y2103452
Weather Station ID	71	71	71	71	71
Weather Station Exp.	03/04/2022	03/04/2022	03/04/2022	03/04/2022	03/04/2022
Transducer ID	3	3	3	3	3
Transducer Exp.	02/19/2022	02/19/2022	02/19/2022	02/19/2022	02/19/2022
Can Size (L)	6	6	6	6	6
Evac Temp (F)	71.0	71.0	71.0	71.0	71.0
Evac Pbar (mmHg)	759.2	759.2	759.2	759.2	759.2
Evac Gauge (mmHg)	-759.2	-759.2	-759.2	-759.2	-759.2
Evac Analyst	aamears	aamears	aamears	aamears	aamears
Evac Time	11/17/21 13:19	11/17/21 13:18	11/17/21 13:17	11/17/21 13:18	11/17/21 13:19
Evac Vol (L)	0.000	0.000	0.000	0.000	0.000
Recd. Temp (F)	71.2	71.2	71.2	71.2	71.2
Recd. Pbar (mmHg)	760.2	760.2	760.2	760.2	760.2
Recd. Gauge (mmHg)	-453.0	-398.0	-319.0	-424.0	-385.0
Recd Vol (L)	2.411	2.842	3.462	2.638	2.944
P1 Temp (F)	71.2	71.2	71.2	71.2	71.2
P1 Pbar (mmHg)	760.2	760.2	760.2	760.2	760.2
P1 Gauge (mmHg)	763.0	813.0	843.0	815.0	820.0
P1 Analyst	aamears	aamears	aamears	aamears	aamears
P1 Time	11/17/21 17:04	11/17/21 17:03	11/17/21 17:02	11/17/21 17:02	11/17/21 17:03
P1 Vol (L)	11.953	12.345	12.581	12.361	12.400
P1 DF Override	false	false	false	false	false
P1 Dilution Factor	4.958	4.343	3.634	4.685	4.211

Enthalpy Analytical

Company: Trinity Consultants, Inc.

Job No.: 1121-078 - EPA Method TO-11A

Site: Bristol Landfill

Formaldehyde

Client's Sample Name	Filename #1	Curve Min	Curve Max	MDL	Ret Time (min)	Conc #1 (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Compost - (DNPH-3)	036	0.0452	15.1	0.0169	4.22	0.0210	1	5.00	0.105	J
Replicate Analysis / Compost - (DNPH-3)	037	0.0452	15.1	0.0169	4.22	0.0206	1	5.00	0.104	J
								% Difference	0.8%	
Hot Wells Active (DNPH-4)	038	0.0452	15.1	0.0169	4.23	0.0377	1	5.00	0.189	J
Existing Landfill (498) - (DNPH-2)	039	0.0452	15.1	0.0169	4.23	0.0225	1	5.00	0.113	J
Leachate Tank - (DNPH-1)	040	0.0452	15.1	0.0169	4.22	0.0226	1	5.00	0.113	J
Chimney - (DNPH-5)	041	0.0452	15.1	0.0169	4.20	0.0335	1	5.00	0.167	J

Enthalpy Analytical

Company: Trinity Consultants, Inc.

Job No.: 1121-078 - EPA Method TO-11A

Site: Bristol Landfill

QC Samples

QC Type	QC Sample Name		Formaldehyde
Spiked Blank Tube	1121-078.LCS.SG	catch (ug)	15.3
	spiked:	spike (ug)	18.1
	spikeprep1546.spk * 10uL	recovery	84.5%
Blank Media	1121-078.MB.SG	ug/mL	ND

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	Trinity Consultants Inc
Job #	1121-078 - EPA Method 15/16-Type (Bag)
Client #	214701.0071 Site: Bristol Landfill

Custody	Alyssa Miller received the samples on 11/17/21 after being relinquished by Trinity Consultants Inc. The samples were received at ambient temperature and in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.
Analysis	The samples were analyzed for hydrogen sulfide, carbonyl sulfide, methyl mercaptan, dimethyl sulfide, carbon disulfide, and dimethyl disulfide using the general analytical procedures in EPA Methods 15 and 16. The sample and standards were introduced directly to the column using an automated multi-port Valco gas sampling valve equipped with a stainless steel loop. All analytes were referenced to gas phase standards prepared using certified permeation devices. The Hewlett Packard Model 5890, Series II Gas Chromatograph "Zeppo" (S/N 3235A4448X) was equipped with a Flame Photometric Detector, for these analyses.
Calibration	The calibration curve is located in the Raw Data section of this report. The first page of the calibration curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.
Chromatographic Conditions	The acquisition methods (DUALFPD8_SHORT.M and DUALFPD8.M) may be made available upon request.
QC Notes	A hydrogen sulfide Laboratory Control Sample (LCS) was analyzed with the samples and exhibited a recovery value of 96.2%. The analytes of interest were not identified at levels greater than the detection limit in the analysis of the laboratory blank.
Reporting Notes	The results presented in this report are representative of the sample as provided to the laboratory.

ENTHALPY
ANALYTICAL

Enthalpy Analytical Narrative Summary

Company	Trinity Consultants Inc
Job #	1121-078 – EPA Method 3C (Canister)
Client #	214701.0071 Site: Bristol Landfill

Custody	Alyssa Miller received the samples on 11/17/21 after being relinquished by Trinity Consultants Inc. The samples were received at ambient temperature and in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.
Analysis	The samples were analyzed for hydrogen, oxygen, nitrogen, carbon monoxide, methane, and carbon dioxide using the analytical procedures in EPA Method 3C, Determination of Carbon Dioxide, Methane, Nitrogen, and Oxygen from Stationary Sources. The samples and standards were introduced directly to the column using an automated multi-port Valco gas sampling valve equipped with a stainless steel loop. All target analytes were referenced to certified gas phase standards. Upon receipt, the canister pressures were measured and recorded. The cans were then pressurized and a dilution ratio was calculated for each canister (see Canister Pressurization Sheet). The Agilent 6890 Gas Chromatograph "Betty" was equipped with a Thermal Conductivity Detector and used for these analyses.
Calibration	The calibration curve is located in the Raw Data section of this report. For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.
Chromatographic Conditions	The acquisition method (GC142P133_CAL.M) is may be made available upon request.

ENTHALPY ANALYTICAL

Enthalpy Analytical Narrative Summary
(continued)

QC Notes	The analysis of the laboratory helium blank contained oxygen and nitrogen at concentrations greater than the MDL value, but below the LOQ. None of the other compounds were identified at concentrations greater than the MDL values.
Reporting Notes	These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above. The results presented in this report are representative of the sample as provided to the laboratory.

Enthalpy Analytical Narrative Summary

Company	Trinity Consultants
Job #	1121-078 - EPA Method TO-11A
Site	Bristol Landfill

Custody	Alyssa Miller received the samples on 11/17/21 after being relinquished by Battelle Memorial Institute. The samples were received at 4.9 °C and in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.
Analysis	The samples were analyzed for formaldehyde using the analytical procedures in EPA Method TO-11A, Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC). The High Performance Liquid Chromatograph "Groucho" was used for these analyses. The SKC coated silica gel (Cat# 226-119) tubes were desorbed whole using 5 mL of a solvent and shaken on 11/18/21.
Calibration	The calibration curve is included in the Raw Data section of this report. The first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.
Chromatographic Conditions	The acquisition method (Tobacco_AgilentZorbaxSBC CARBS.M) is available upon request.
QC Notes	All sample preparation and analytical holding times specified in the method were met. Formaldehyde was not identified at a concentration level greater than the detection limit in the analysis of the laboratory blank. A replicate analysis was analyzed using an aliquot of sample ***Compost – (DNPH-3)***. The initial and duplicate analysis differed by 0.8%. A second source sample was analyzed with the samples and yielded a recovery value of 100%.

ENTHALPY
ANALYTICAL

Enthalpy Analytical Narrative Summary
(continued)

Reporting Notes	These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above. The results presented in this report are representative of the samples as provided to the laboratory.

General Reporting Notes

The following are general reporting notes that are applicable to all Enthalpy Analytical, LLC data reports, unless specifically noted otherwise.

- Any analysis which refers to the method as ***"Type"*** represents a planned deviation from the reference method. For instance a Hydrogen Sulfide assay from a Tedlar bag would be labeled as "EPA Method 16-Type" because Tedlar bags are not mentioned as one of the collection options in EPA Method 16.

- The acronym ***MDL*** represents the Minimum Detection Limit. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.

- The acronym ***LOQ*** represents the Limit of Quantification. Below this value the laboratory cannot quantitate the analyte of interest within the criteria of the method.

- The acronym ***ND*** following a value indicates a non-detect or analytical result below the MDL.

- The letter ***J*** in the Qualifier or Flag column in the results indicates that the value is between the MDL and the LOQ. The laboratory can positively identify the analyte of interest as present, but the value should be considered an estimate.

- The letter ***E*** in the Qualifier or Flag column indicates an analytical result exceeding 100% of the highest calibration point. The associated value should be considered as an estimate.

- Sample results are presented 'as measured' for single injection methodologies, or an average value if multiple injections are made. If all injections are below the MDL, the sample is considered non-detect and the ND value is presented. If one, but not all, are below the MDL, the MDL value is used for any injections that are below the MDL. For example, if the MDL is 0.500 and LOQ is 1.00, and the instrument measures 0.355, 0.620, and 0.442 - the result reported is the average of 0.500, 0.620, and 0.500 - - - i.e. 0.540 with a J flag.

- When a spike recovery (Bag Spike, Collocated Spike Train, or liquid matrix spike) is being calculated, the native (unspiked) sample result is used in the calculations, as long as the value is above the MDL. If a sample is ND, then 0 is used as the native amount (not the MDL value).

- The acronym ***DF*** represents Dilution Factor. This number represents dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to determine the final undiluted sample results.

- The addition of ***MS*** to the Sample ID represents a Matrix Spike. An aliquot of an actual sample is spiked with a known amount of analyte so that a percent recovery value can be determined. The MS analysis indicates what effect the sample matrix may have on the target analyte, i.e. whether or not anything in the sample matrix interferes with the analysis of the analyte(s).

General Reporting Notes
(continued)

- The addition of ***MSD*** to the Sample ID represents a Matrix Spike Duplicate. Prepared in the same manner as a MS, the use of duplicate matrix spikes allows further confirmation of laboratory quality by showing the consistency of results gained by performing the same steps multiple times.

- The addition of ***LD*** to the Sample ID represents a Laboratory Duplicate. The analyst prepares an additional aliquot of sample for testing and the results of the duplicate analysis are compared to the initial result. The result should have a difference value of within 10% of the initial result (if the results of the original analysis are greater than the LOQ).

- The addition of ***AD*** to the Sample ID represents an Alternate Dilution. The analyst prepares an additional aliquot at a different dilution factor (usually double the initial factor). This analysis helps confirm that no additional compound is present and coeluting or sharing absorbance with the analyte of interest, as they would have a different response/absorbance than the analyte of interest.

- The Sample ID ***LCS*** represents a Laboratory Control Sample. Clean matrix, similar to the client sample matrix, prepared and analyzed by the laboratory using the same reagents, spiking standards and procedures used for the client samples. The LCS is used to assess the control of the laboratory's analytical system. Whenever spikes are prepared for our client projects, two spikes are retained as LCSs. The LCSs are labeled with the associated project number and kept in-house at the appropriate temperature conditions. When the project samples are received for analysis, the LCSs are analyzed to confirm that the analyte could be recovered from the media, separate from the samples which were used on the project and which may have been affected by source matrix, sample collection, and/or sample transport.

- **Significant Figures**: Where the reported value is much greater than unity (1.00) in the units expressed, the number is rounded to a whole number of units, rather than to 3 significant figures. For example, a value of 10,456.45 ug catch is rounded to 10,456 ug. There are five significant digits displayed, but no confidence should be placed on more than two significant digits. In the case of small numbers, generally 3 significant figures are presented, but still only 2 should be used with confidence. Many neat materials are only certified to 3 digits, and as the mathematically correct final result is always 1 digit less than all its pre-cursors - 2 significant figures are what are most defensible.

- **Manual Integration**: The data systems used for processing will flag manually integrated peaks with an "M". There are several reasons a peak may be manually integrated. These reasons will be identified by the following two letter designations on sample chromatograms, if provided in the report. The peak was ***not integrated*** by the software **"NI"**, the peak was ***integrated incorrectly*** by the software **"II"** or the ***wrong peak*** was integrated by the software **"WP"**. These codes will accompany the analyst's manual integration stamp placed next to the compound name on the chromatogram.

Sample Custody

Chain of Custody Record

ENTHALPY

Page____of____

Special Handling:
- ☐ Standard Turn Around Time
- ☐ Rush Turn Around Time -- Date Needed_____
- All TATs Subject to Approval by Enthalpy Analytical
- All Bag/Can Samples Disposed of 1 Month from Receipt.
- All Other Samples Disposed of 4 Months from Receipt.

Sample(s) Collected by: Keegan Waggener
Client Name: Trinity Consultants
Project Manager: Russell Bailey

Project Number: 1121-078
Site Name: Bristol Landfill
Location: Compost

PO#:
Telephone#: 678-938-1425
Email:

For spiked or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH W=Water O=Other
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	Sample Containers: # of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	Analyses:	Notes:
DNPH-3	11-16				A									TO-11A
Tedlar-3	11-16	0921			A									TO-15/16
Summa-3	11-16				A									TO-15/16

← 5.2°C Raytek
→ Ambient temp good condition AMM 11.17.21

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt:
Keegan Waggener	11-16	Alyssa Mueller	11.17.21	1120	☒ Iced ☒ Ambient ☒ °C 5.2
					☐ Iced ☐ Ambient ☐ °C_____
					☐ Iced ☐ Ambient ☐ °C_____

800-1 Capitola Drive • Durham, NC 27713 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

ENTHALPY

Chain of Custody Record

Page____of____

Special Handling:
- ☐ Standard Turn Around Time
- ☐ Rush Turn Around Time -- Date Needed________
- All TATs Subject to Approval by Enthalpy Analytical
- All Bag/Can Samples Disposed of 1 Month from Receipt.
- All Other Samples Disposed of 4 Months from Receipt.

Sample(s) Collected by:	Keegan Waggener	Project Number:	1121-078	PO#:	
Client Name:	Trinity Consultants	Site Name:	Bristol Landfill	Telephone#:	678-938-1425
Project Manager:	Russell Bailey	Location:	Hot Wells (Active)	Email:	

For spiked or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH W=Water O=Other
X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	Analyses:								Notes:
DNPH-4	11-16				A																TO-11 A
Tedlar-4	11-16	1021			A																15/16
Summa-4	11-16				A																[illegible]

← 5.2°C Raytek 2
→ Ambient temp
good condition
[illegible] 11-17-21

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt:
Keegan Waggener	11-16	Alyssa [illegible]	11-17-21	1120	☒ Iced ☒ Ambient ☒ °C 5.2
					☐ Iced ☐ Ambient ☐ °C______
					☐ Iced ☐ Ambient ☐ °C______

800-1 Capitola Drive • Durham, NC 27713 • (919) 850-4392 • FAX (919) 850-9012 • www.enthalpy.com

ENTHALPY

Chain of Custody Record

Page ____ of ____

Special Handling:

☐ Standard Turn Around Time

☐ Rush Turn Around Time -- Date Needed _____

- All TATs Subject to Approval by Enthalpy Analytical
- All Bag/Can Samples Disposed of 1 Month from Receipt
- All Other Samples Disposed of 4 Months from Receipt.

Sample(s) Collected by: Keegan Waggener

Client Name: Trinity Consultants

Project Manager: Russell Bailey

Project Number: 1121-078

Site Name: Bristol Landfill

Location: Existing Landfill (498)

PO#: _____

Telephone#: 678-938-1425

Email: _____

For spiked or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH W=Water O=Other
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	Analyses:	Notes:
DNPH-2	11-16				A									TO-11A
Tedlar-2	11-16	0827			A									15-16
Summa-2	11-16				A									TO-15/16

← 5.2 °C Baytek
7 Ambient temp
good condition
Amm3 11-17-21

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt:
Keegan Waggener	11-16	Alyssa Miller	11-17-21	1120	☒ Iced ☒ Ambient ☒ °C 5.2
					☐ Iced ☐ Ambient ☐ °C _____
					☐ Iced ☐ Ambient ☐ °C _____

Chain of Custody Record

ENTHALPY ANALYTICAL

Page ____ of ____

Special Handling:
- ☐ Standard Turn Around Time
- ☐ Rush Turn Around Time -- Date Needed _____
- All TATs Subject to Approval by Enthalpy Analytical
- All Bag/Can Samples Disposed of 1 Month from Receipt.
- All Other Samples Disposed of 4 Months from Receipt.

Sample(s) Collected by: Keegan Waggener
Client Name: Trinity Consultants
Project Manager: Russell Raley

Project Number: 1121-078
Site Name: Bristol Landfill
Location: Leachate Tank

PO#:
Telephone#: 678-938-1425
Email:

For spiked or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH W=Water O=Other
X=XAD C=Charcoal SG=Silica Gel
G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	Analyses:	Notes:
DNPH-1	11-16	0726			A									TO-11A
Tedlar-1	11-16	0715			A									TO-15
Summa-1	11-16	0715			A									TO-15

← 5.2°C Rayleigh ambient temp good condition
Initials 11-17-21

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt:
Keegan Waggener	11-16	Alyssa Mueller	11-17-21	1120	☒ Iced ☒ Ambient ☒ °C 5.2
					☐ Iced ☐ Ambient ☐ °C
					☐ Iced ☐ Ambient ☐ °C

Chain of Custody Record

ENTHALPY

Page____of____

Special Handling:

☐ Standard Turn Around Time

☐ Rush Turn Around Time -- Date Needed________

- All TATs Subject to Approval by Enthalpy Analytical
- All Bag/Can Samples Disposed of 1 Month from Receipt.
- All Other Samples Disposed of 4 Months from Receipt.

Sample(s) Collected by: Keegan Waggener
Client Name: Trinity Consultants
Project Manager: Russell Bailey

Project Number: 1121-Ø78
Site Name: Bristol Landfill
Location: Chimney

PO#:
Telephone#: 678-938-1425
Email:

For spiked or duplicate samples: please provide sample volumes for recovery calculations. For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH W=Water O=Other
X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control O=Other

Sample ID	Date	Time	Sample Volume	Type	Matrix	# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other	Analyses:								Notes:
DNPH-S	11-16				A																TO-11A
Tedlar-S	11-16	1415			A																15/16
Summa-S	11-16				A																TO-15/3C

← 5.2°C Reytek
7 Ambient temp
good condition
Amm3 11·17·21

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Condition Upon Receipt
Keegan Waggener	11-16	Alyssa Mmuller	11-17-21	1120	☒ Iced ☒ Ambient ☒ °C 5.2
					☐ Iced ☐ Ambient ☐ °C____
					☐ Iced ☐ Ambient ☐ °C____

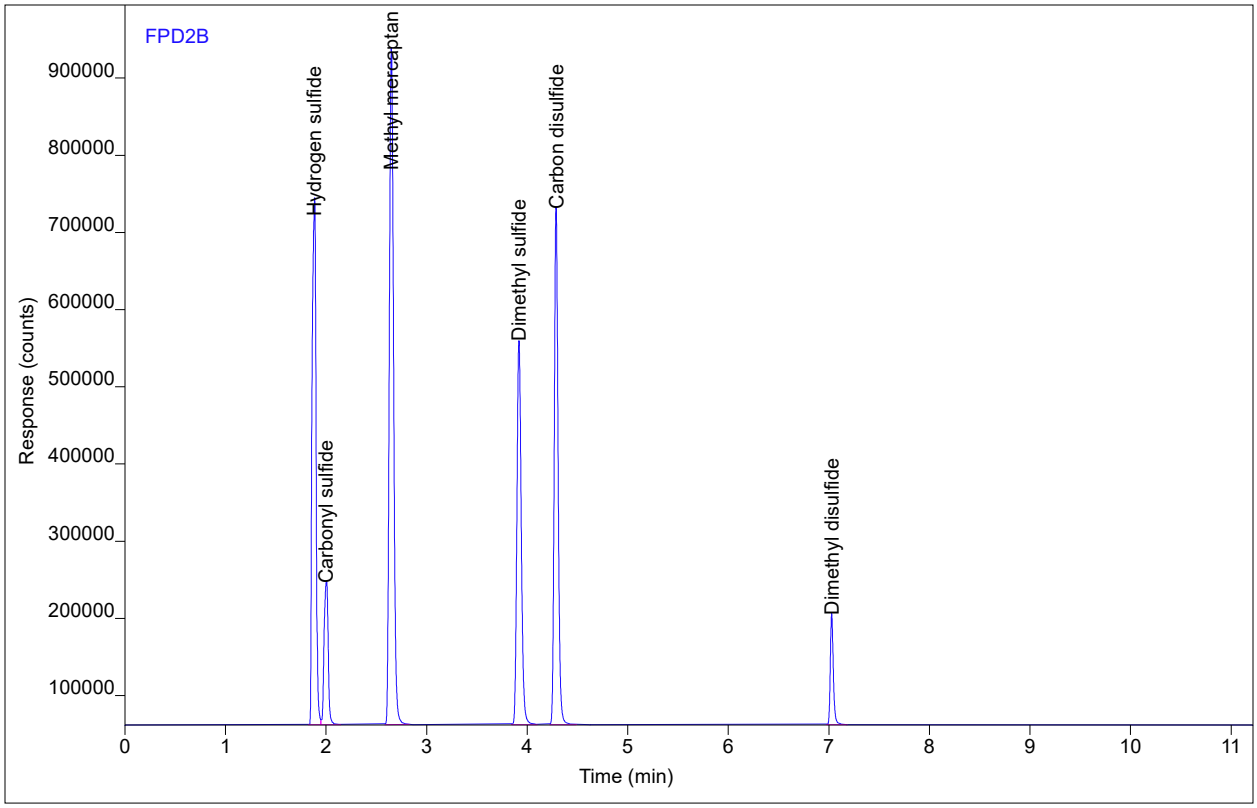
Raw Data

Chromatogram Report

Sample Name	zeppoP0625 #5
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B0901.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 9:16 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



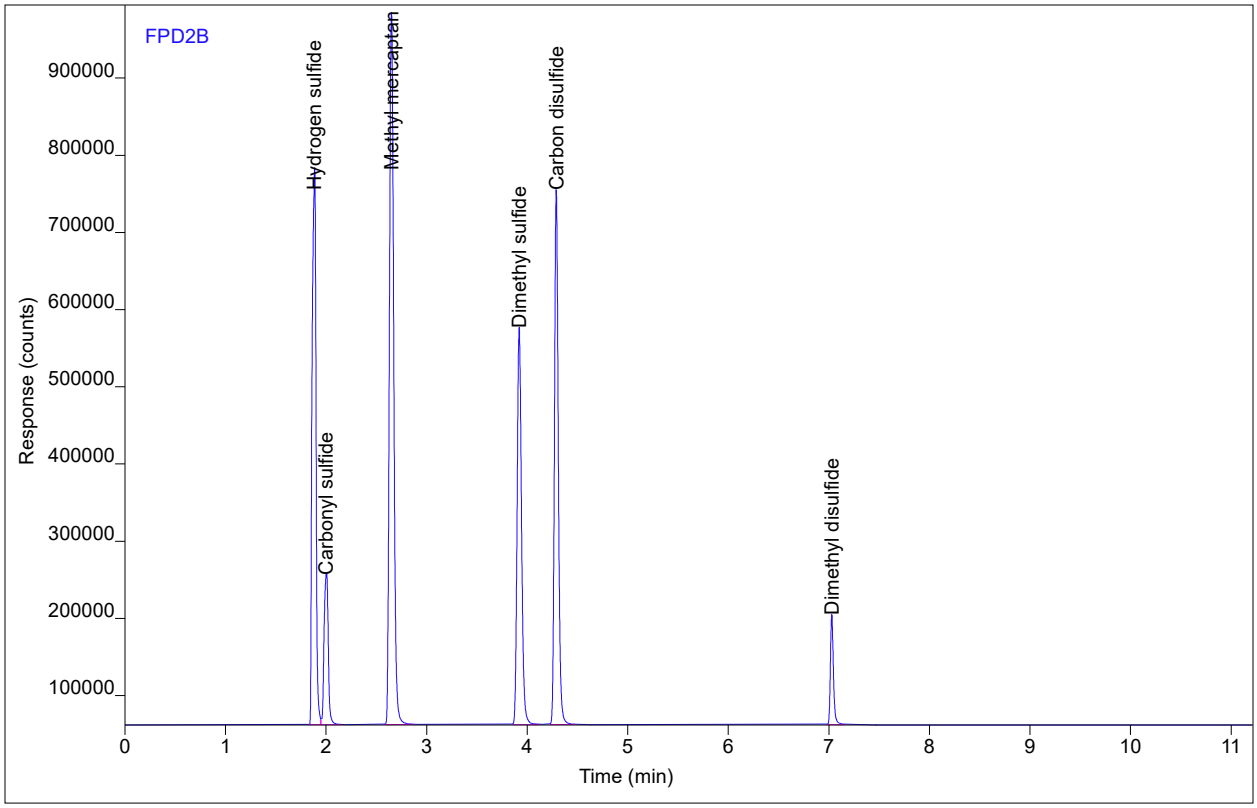
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	1859526	672507	9.81487	1	9.81487	ppmv
Carbonyl sulfide	VB	2.00	527064	184989	4.75644	1	4.75644	ppmv
Methyl mercaptan	BB	2.65	2571362	871601	10.8684	1	10.8684	ppmv
Dimethyl sulfide	BB	3.92	1498031	493745	8.77959	1	8.77959	ppmv
Carbon disulfide	BB	4.29	1770560	664634	5.44980	1	5.44980	ppmv
Dimethyl disulfide	BB	7.03	300170	141708	1.66641	1	1.66641	ppmv

Chromatogram Report

Sample Name	zeppoP0625 #5
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B0902.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 9:33 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



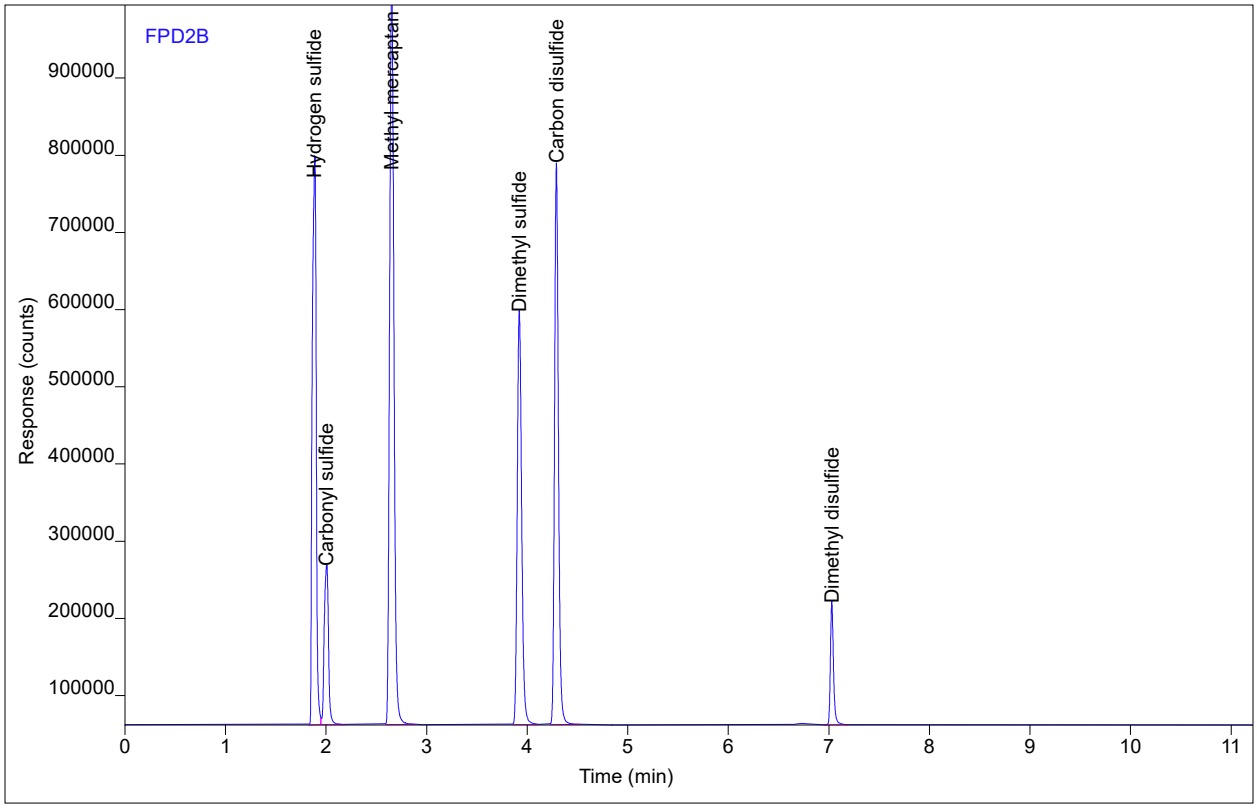
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	1931724	709803	10.0005	1	10.0005	ppmv
Carbonyl sulfide	VB	2.00	568236	195547	4.94005	1	4.94005	ppmv
Methyl mercaptan	BB	2.65	2729785	918110	11.1960	1	11.1960	ppmv
Dimethyl sulfide	BB	3.92	1555738	509823	8.94564	1	8.94564	ppmv
Carbon disulfide	BB	4.29	1850277	689775	5.57248	1	5.57248	ppmv
Dimethyl disulfide	BB	7.03	297978	141349	1.66038	1	1.66038	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #5
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B0903.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 9:50 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



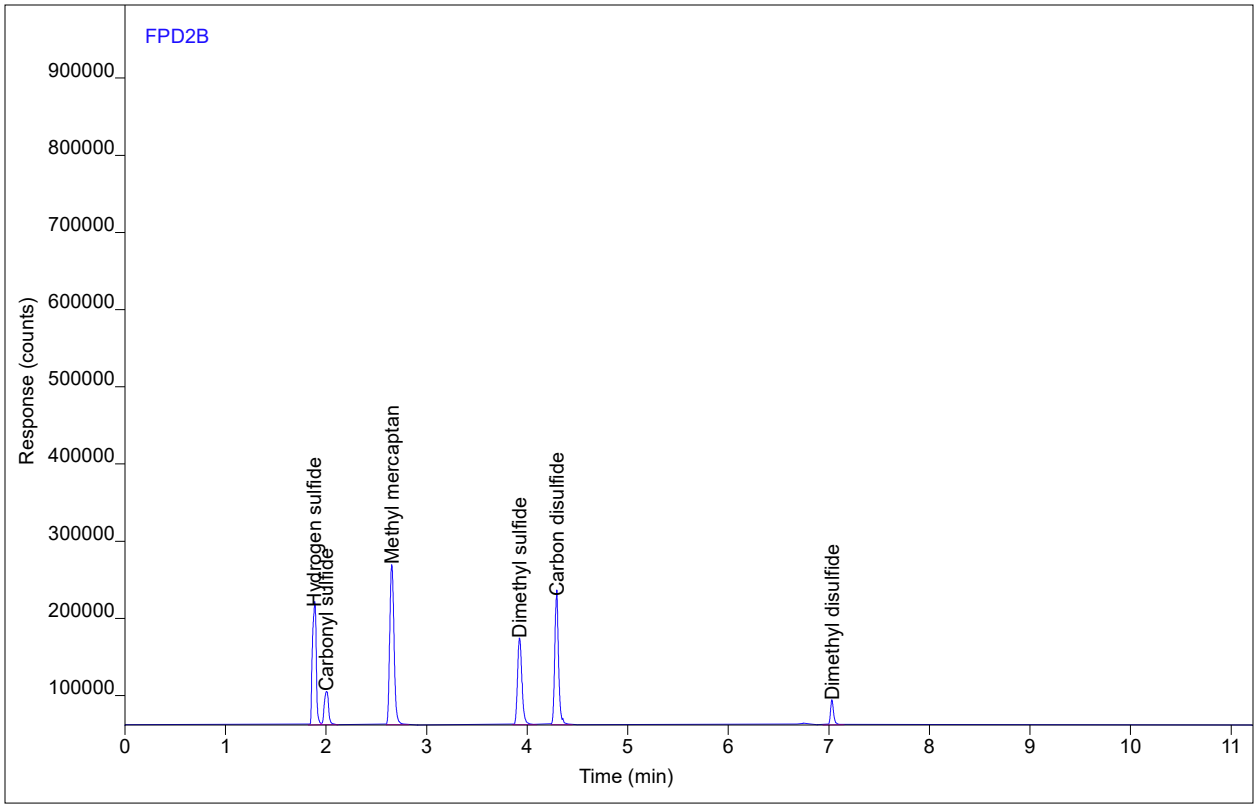
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	2014158	707855	10.2081	1	10.2081	ppmv
Carbonyl sulfide	VB	2.00	612804	203322	5.13151	1	5.13151	ppmv
Methyl mercaptan	BB	2.65	2862530	939093	11.4632	1	11.4632	ppmv
Dimethyl sulfide	BB	3.92	1635759	532582	9.17085	1	9.17085	ppmv
Carbon disulfide	BB	4.29	1957695	721563	5.73374	1	5.73374	ppmv
Dimethyl disulfide	VB	7.03	339293	157628	1.77049	1	1.77049	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #4
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	004B1001.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 10:07 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 4
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



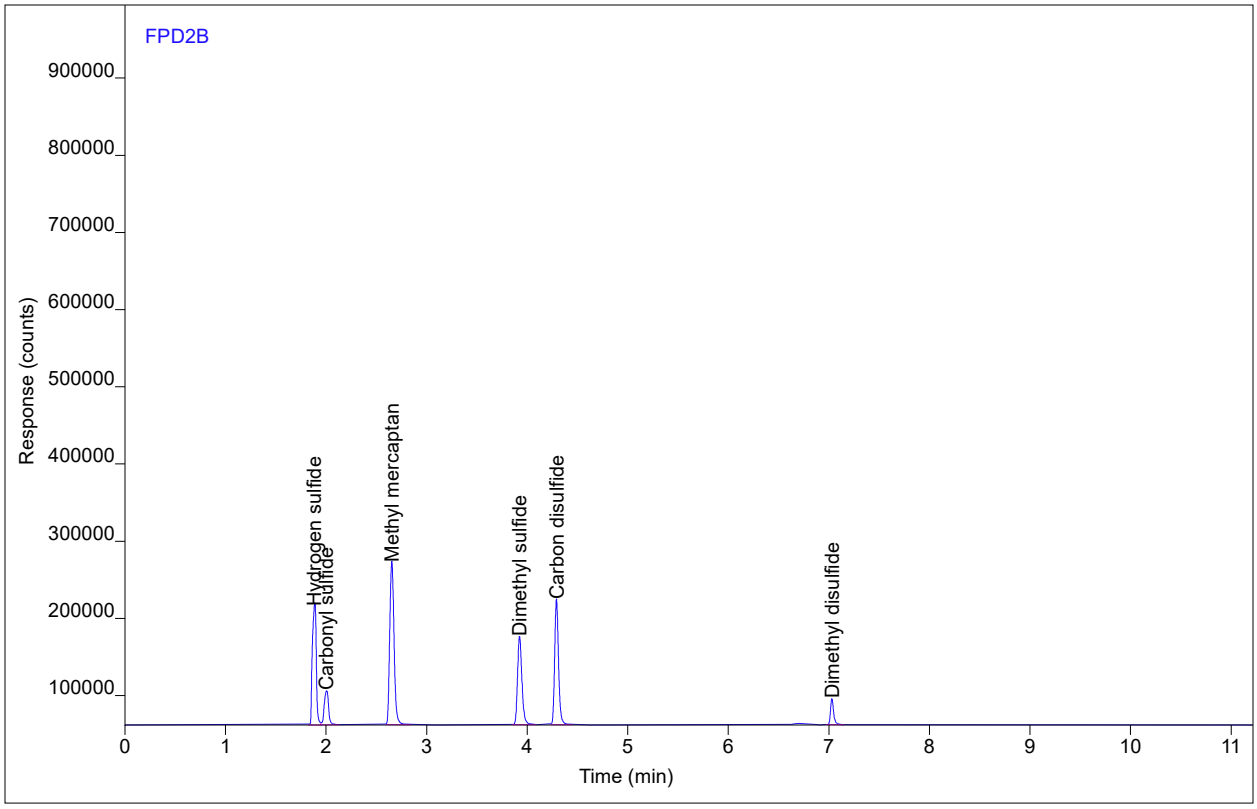
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	423174	152107	4.73929	1	4.73929	ppmv
Carbonyl sulfide	VB	2.00	130867	43181.1	2.35829	1	2.35829	ppmv
Methyl mercaptan	BB	2.65	619498	205913	5.35919	1	5.35919	ppmv
Dimethyl sulfide	BB	3.93	344640	112521	4.23782	1	4.23782	ppmv
Carbon disulfide	BB	4.29	450184	163828	2.72733	1	2.72733	ppmv
Dimethyl disulfide	VB	7.03	71601.7	32093.5	0.82032	1	0.82032	ppmv

Chromatogram Report

Sample Name	zeppoP0625 #4
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	004B1002.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 10:24 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 4
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



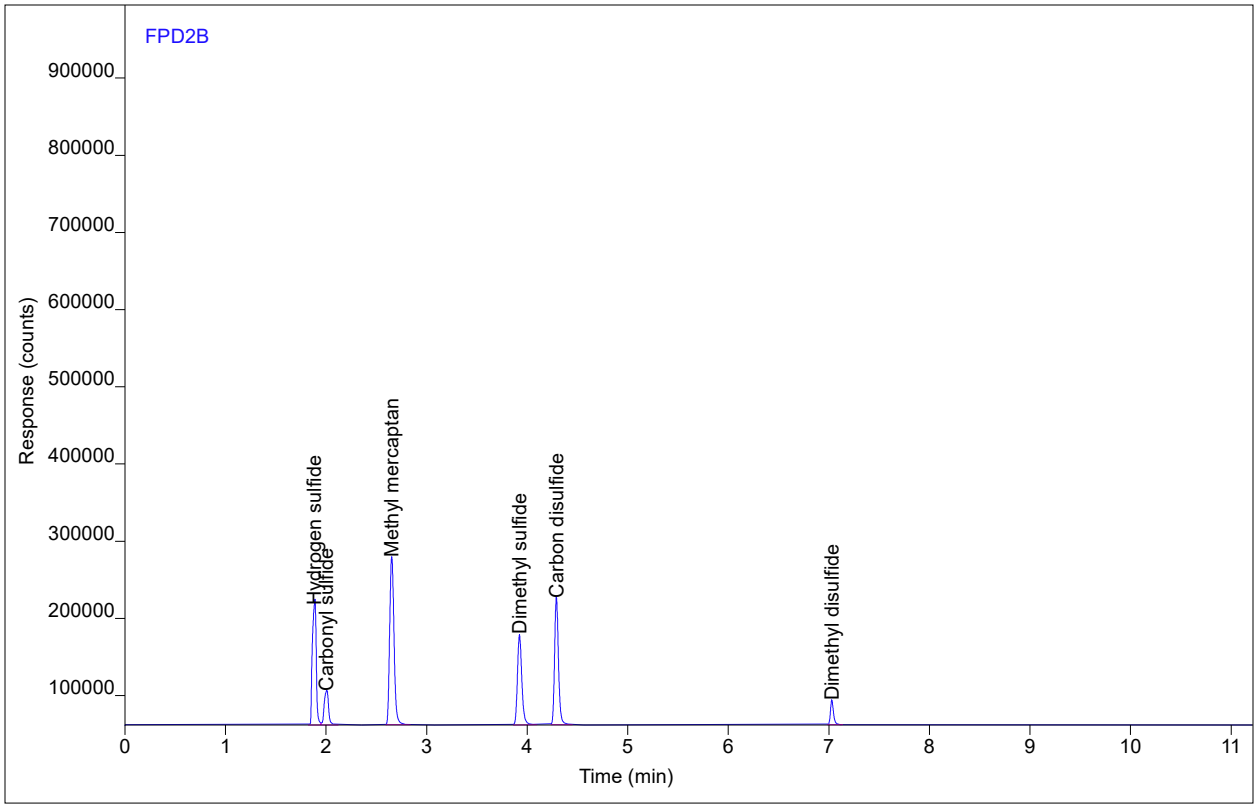
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	427077	153286	4.76074	1	4.76074	ppmv
Carbonyl sulfide	VB	2.00	132617	43690.7	2.37412	1	2.37412	ppmv
Methyl mercaptan	BB	2.65	631437	209686	5.41025	1	5.41025	ppmv
Dimethyl sulfide	BB	3.92	349021	114603	4.26444	1	4.26444	ppmv
Carbon disulfide	BB	4.29	434743	161477	2.67963	1	2.67963	ppmv
Dimethyl disulfide	BB	7.03	74788.4	34197.8	0.83817	1	0.83817	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #4
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	004B1003.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 10:41 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 4
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



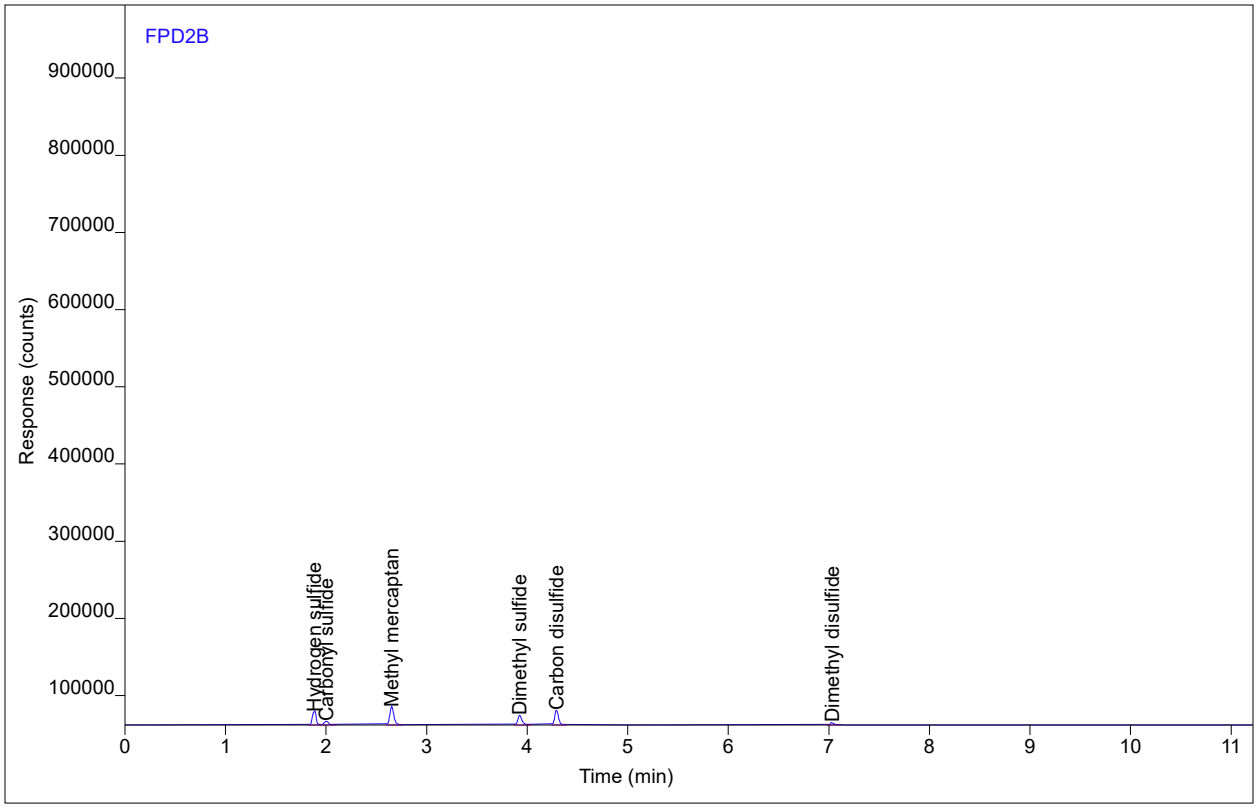
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	433736	154992	4.79710	1	4.79710	ppmv
Carbonyl sulfide	VB	2.00	135016	43981.0	2.39566	1	2.39566	ppmv
Methyl mercaptan	BB	2.65	655165	215862	5.51031	1	5.51031	ppmv
Dimethyl sulfide	BB	3.92	353954	116043	4.29421	1	4.29421	ppmv
Carbon disulfide	BB	4.29	444304	164829	2.70926	1	2.70926	ppmv
Dimethyl disulfide	BB	7.03	68521.4	32047.3	0.80267	1	0.80267	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #3
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	003B1101.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 10:58 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 3
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



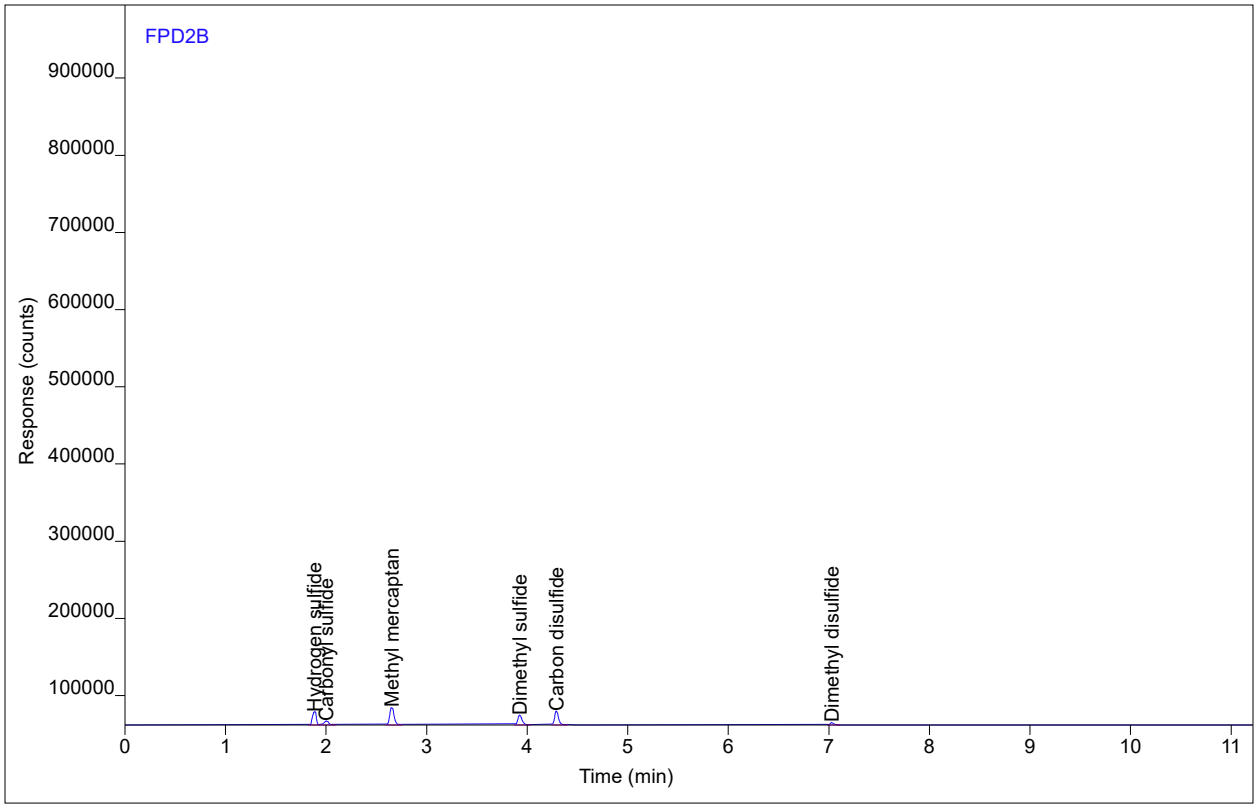
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	46199.5	17198.9	1.59463	1	1.59463	ppmv
Carbonyl sulfide	VB	2.00	14678.7	4956.90	0.78365	1	0.78365	ppmv
Methyl mercaptan	BB	2.65	67713.3	23460.6	1.78452	1	1.78452	ppmv
Dimethyl sulfide	BB	3.93	36940.4	12050.8	1.40082	1	1.40082	ppmv
Carbon disulfide	BB	4.29	50742.8	19428.9	0.90468	1	0.90468	ppmv
Dimethyl disulfide	BB	7.03	7640.63	3225.70	0.27129	1	0.27129	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #3
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	003B1102.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 11:14 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 3
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



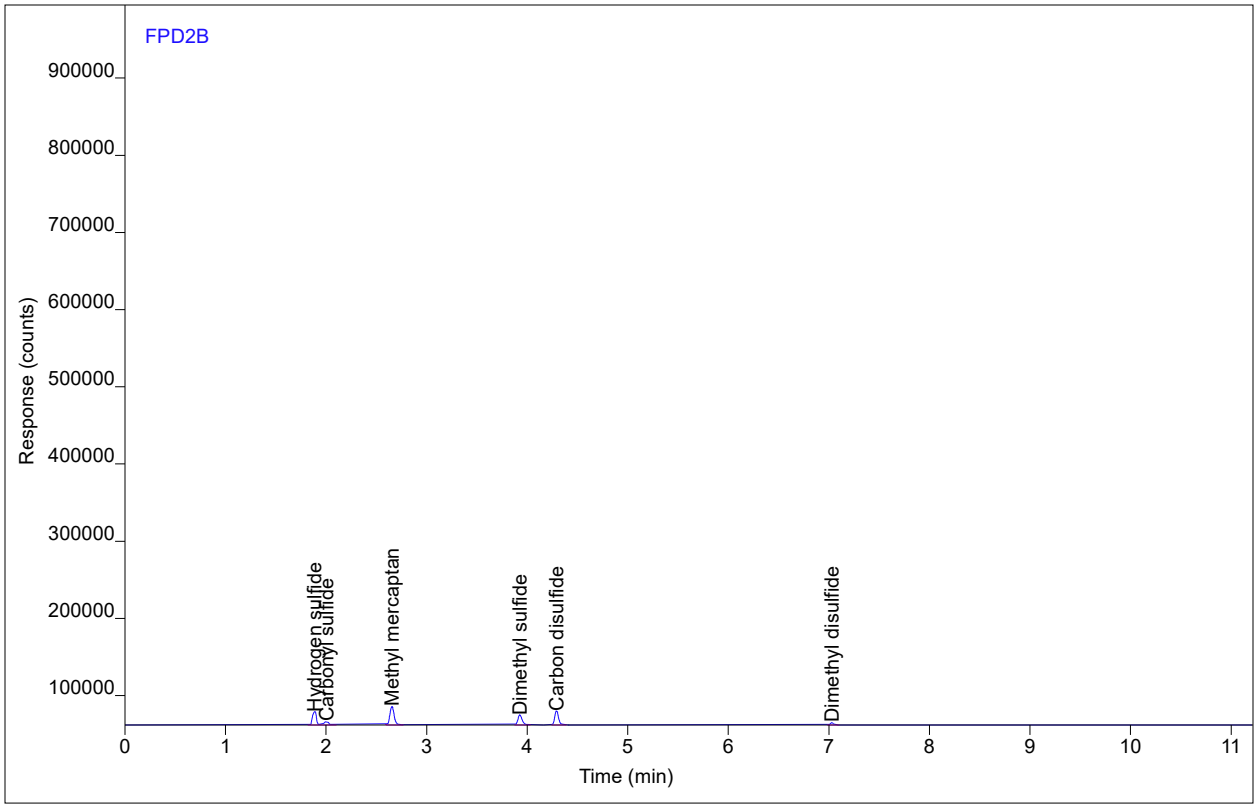
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	46843.5	16956.3	1.60552	1	1.60552	ppmv
Carbonyl sulfide	VB	2.00	15698.9	5127.75	0.81062	1	0.81062	ppmv
Methyl mercaptan	BB	2.65	69400.2	23260.8	1.80647	1	1.80647	ppmv
Dimethyl sulfide	BB	3.93	38253.6	12689.8	1.42529	1	1.42529	ppmv
Carbon disulfide	BB	4.29	49327.2	18516.3	0.89184	1	0.89184	ppmv
Dimethyl disulfide	BB	7.03	7781.34	3657.51	0.27375	1	0.27375	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #3
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	003B1103.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 11:31 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 3
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



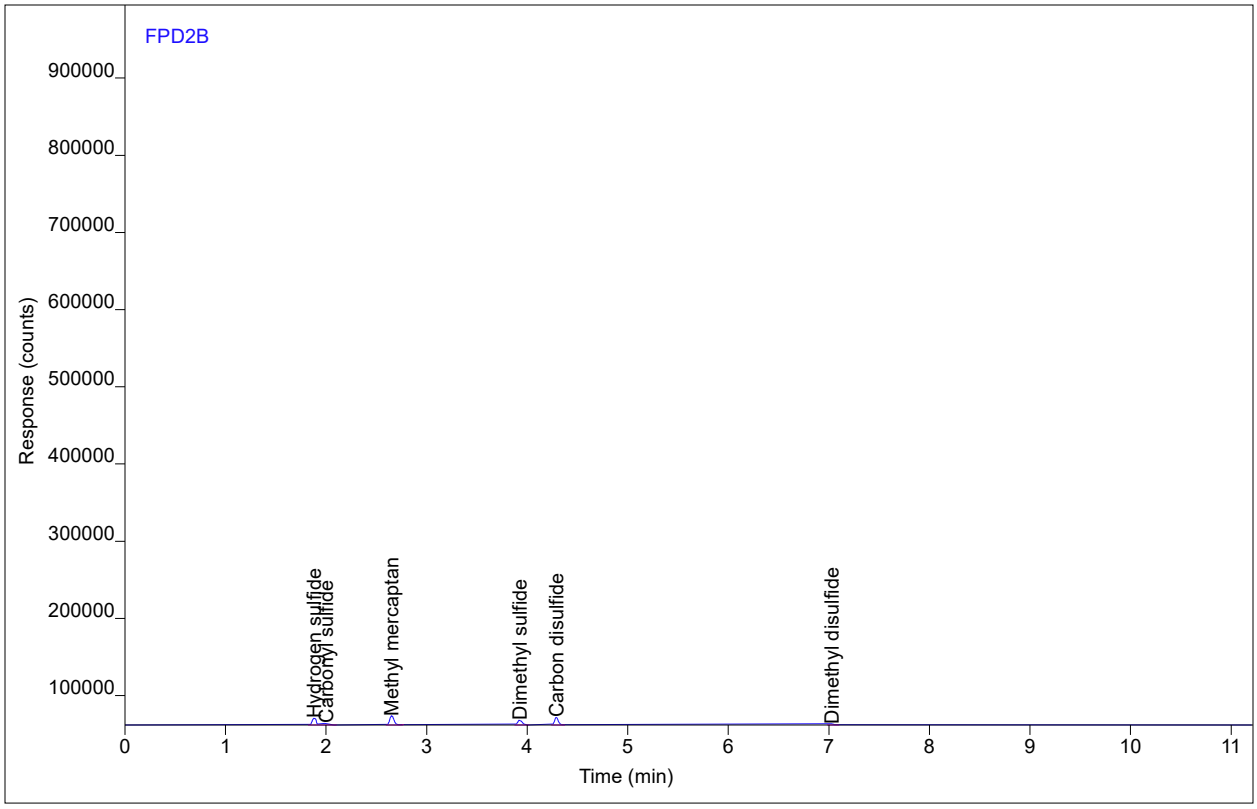
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.89	47126.8	16656.0	1.61029	1	1.61029	ppmv
Carbonyl sulfide	VB	2.01	15115.7	4669.05	0.79532	1	0.79532	ppmv
Methyl mercaptan	BB	2.66	70290.6	23714.2	1.81794	1	1.81794	ppmv
Dimethyl sulfide	BB	3.93	38664.9	12578.1	1.43287	1	1.43287	ppmv
Carbon disulfide	BB	4.29	49361.9	18361.5	0.89215	1	0.89215	ppmv
Dimethyl disulfide	BB	7.03	7292.59	3379.68	0.26510	1	0.26510	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #2
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	002B1201.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 11:48 AM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 2
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



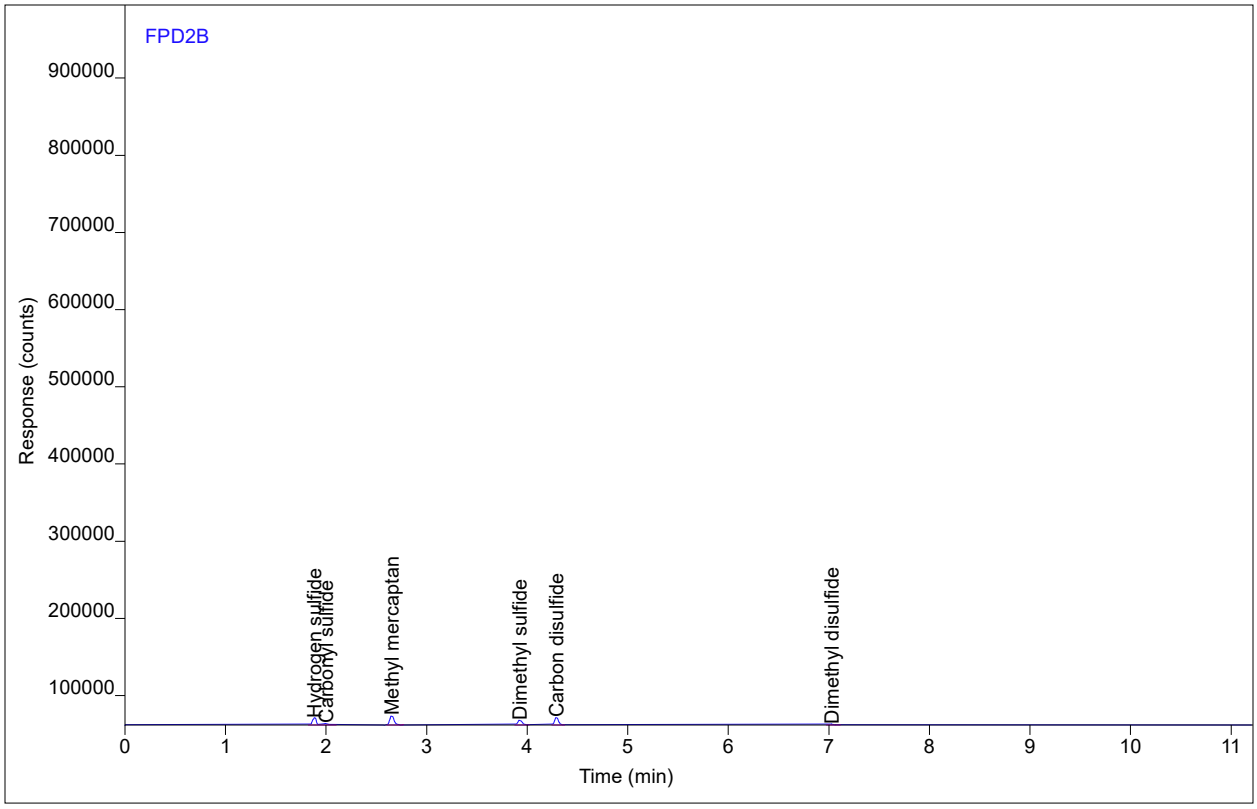
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	24018.4	9120.82	1.15596	1	1.15596	ppmv
Carbonyl sulfide	VB	2.00	8179.48	2718.69	0.58376	1	0.58376	ppmv
Methyl mercaptan	BB	2.65	35392.0	12067.3	1.29285	1	1.29285	ppmv
Dimethyl sulfide	BB	3.93	21042.4	6806.05	1.05982	1	1.05982	ppmv
Carbon disulfide	BB	4.29	26409.9	10093.5	0.65032	1	0.65032	ppmv
Dimethyl disulfide	BB	7.03	4217.89	1742.87	0.20222	1	0.20222	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #2
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	002B1202.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 12:05 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 2
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



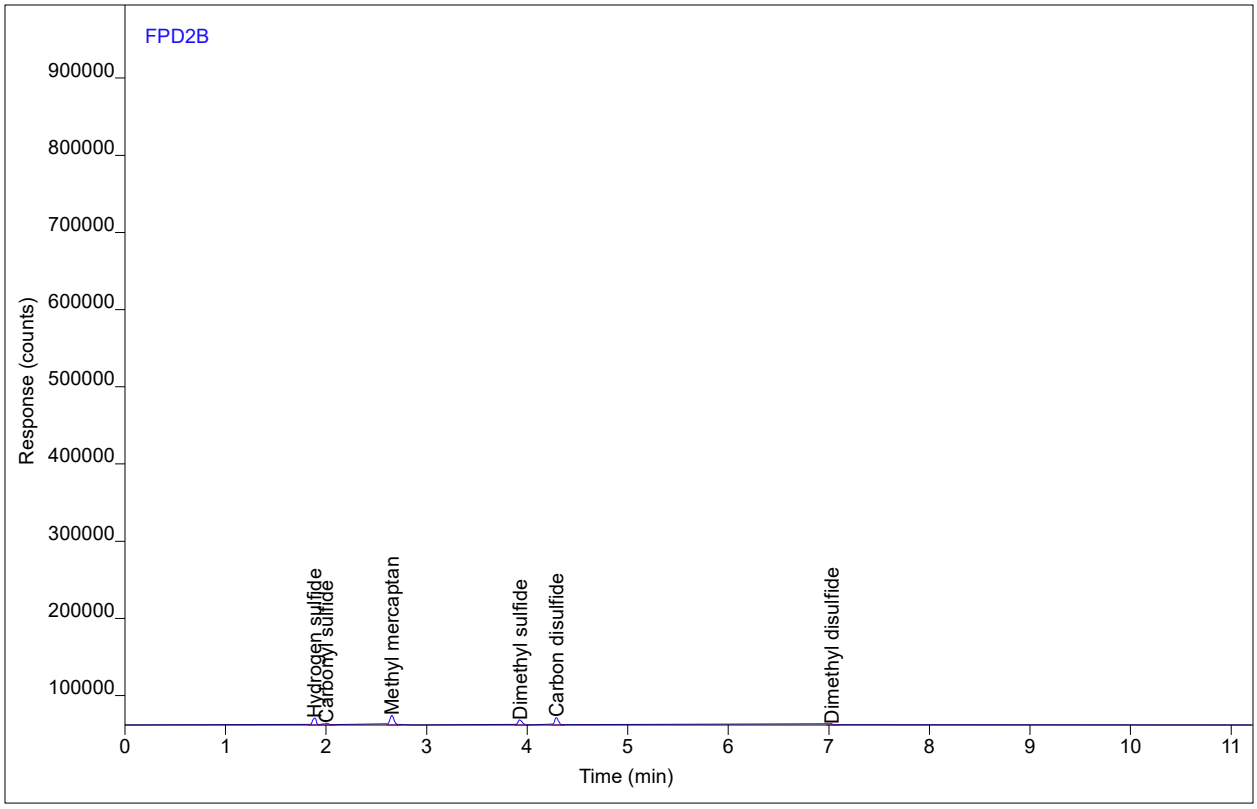
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	25150.3	9288.71	1.18243	1	1.18243	ppmv
Carbonyl sulfide	VB	2.00	7795.89	2565.81	0.56981	1	0.56981	ppmv
Methyl mercaptan	BB	2.65	36426.5	12399.8	1.31148	1	1.31148	ppmv
Dimethyl sulfide	BB	3.93	20354.9	6677.08	1.04251	1	1.04251	ppmv
Carbon disulfide	BB	4.29	27008.7	10130.4	0.65773	1	0.65773	ppmv
Dimethyl disulfide	BB	7.03	3875.23	1644.92	0.19392	1	0.19392	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #2
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	002B1203.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 12:22 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 2
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



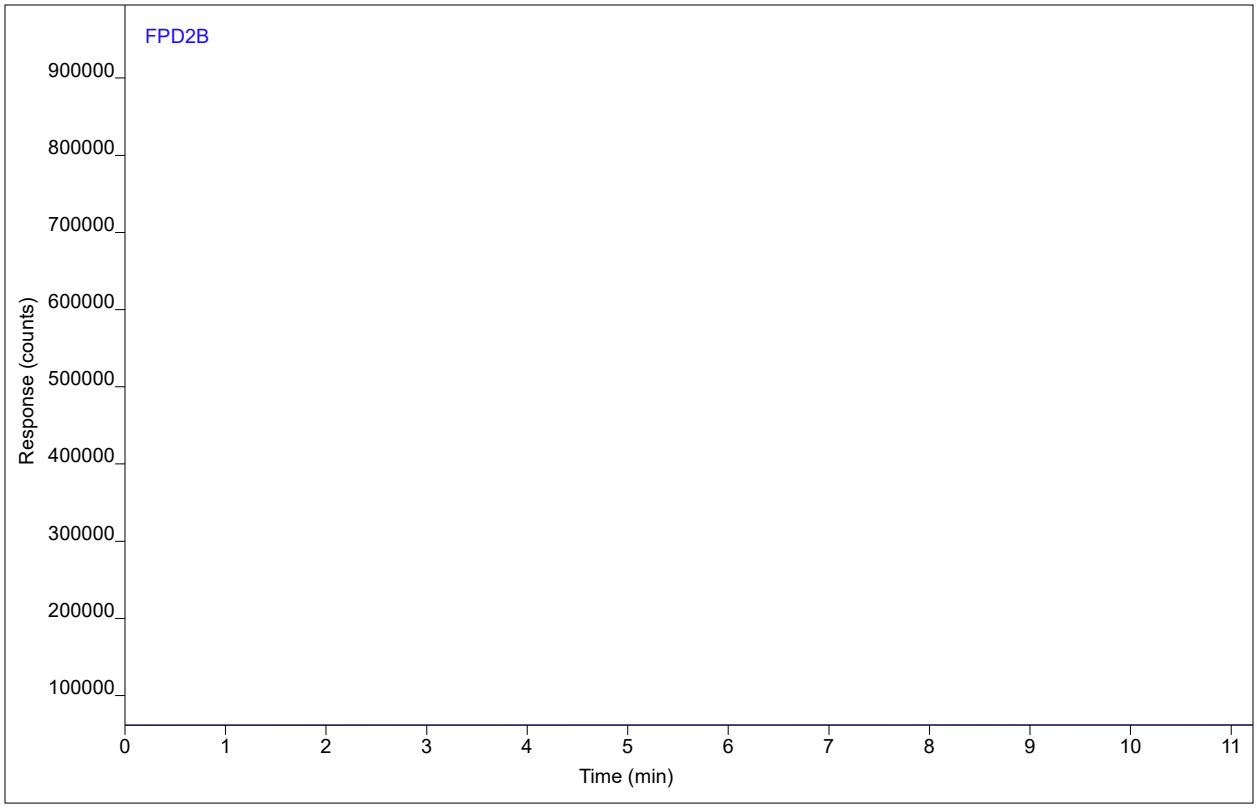
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	23508.4	8695.40	1.14382	1	1.14382	ppmv
Carbonyl sulfide	VB	2.00	7711.33	2753.97	0.56669	1	0.56669	ppmv
Methyl mercaptan	BB	2.65	35810.1	12197.3	1.30041	1	1.30041	ppmv
Dimethyl sulfide	BB	3.93	20282.8	6511.14	1.04068	1	1.04068	ppmv
Carbon disulfide	BB	4.29	26239.5	10039.8	0.64820	1	0.64820	ppmv
Dimethyl disulfide	BB	7.03	4182.09	1736.24	0.20137	1	0.20137	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0551 #MB
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1301.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 12:39 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



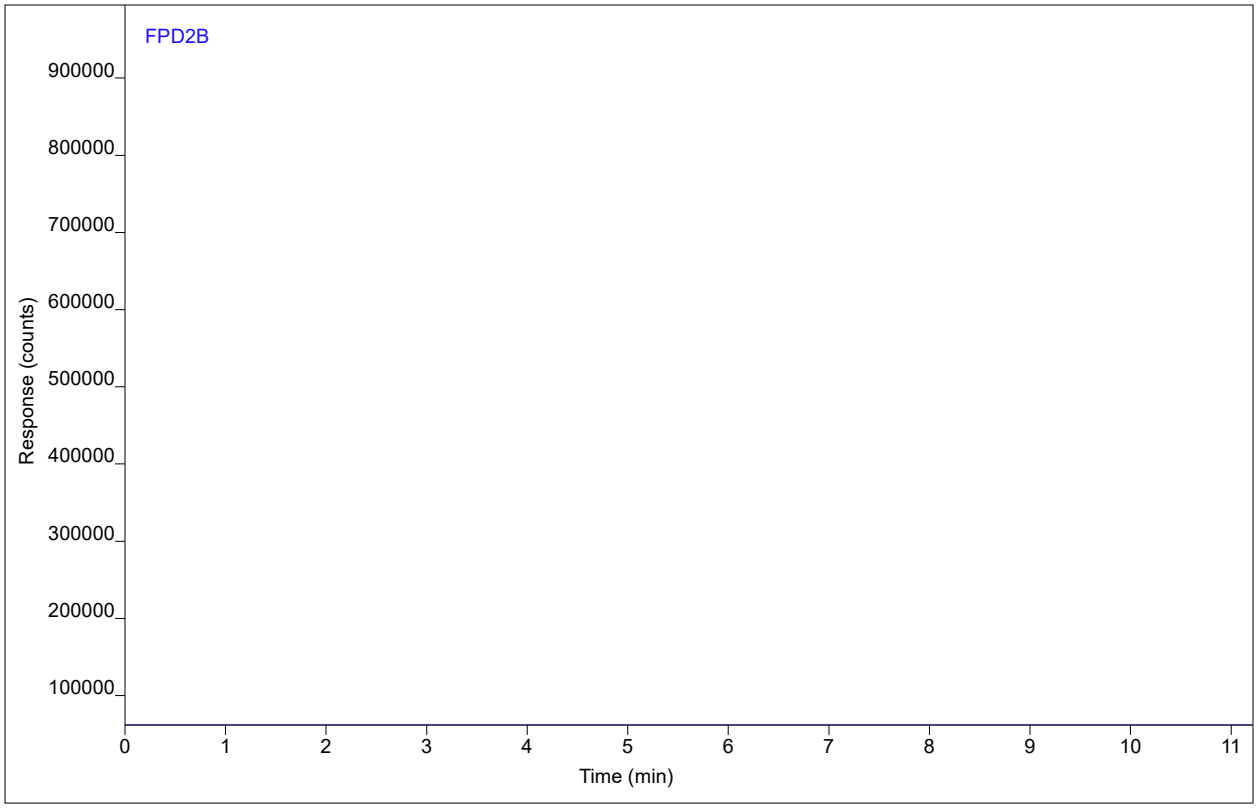
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0551 #MB
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1302.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 12:56 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



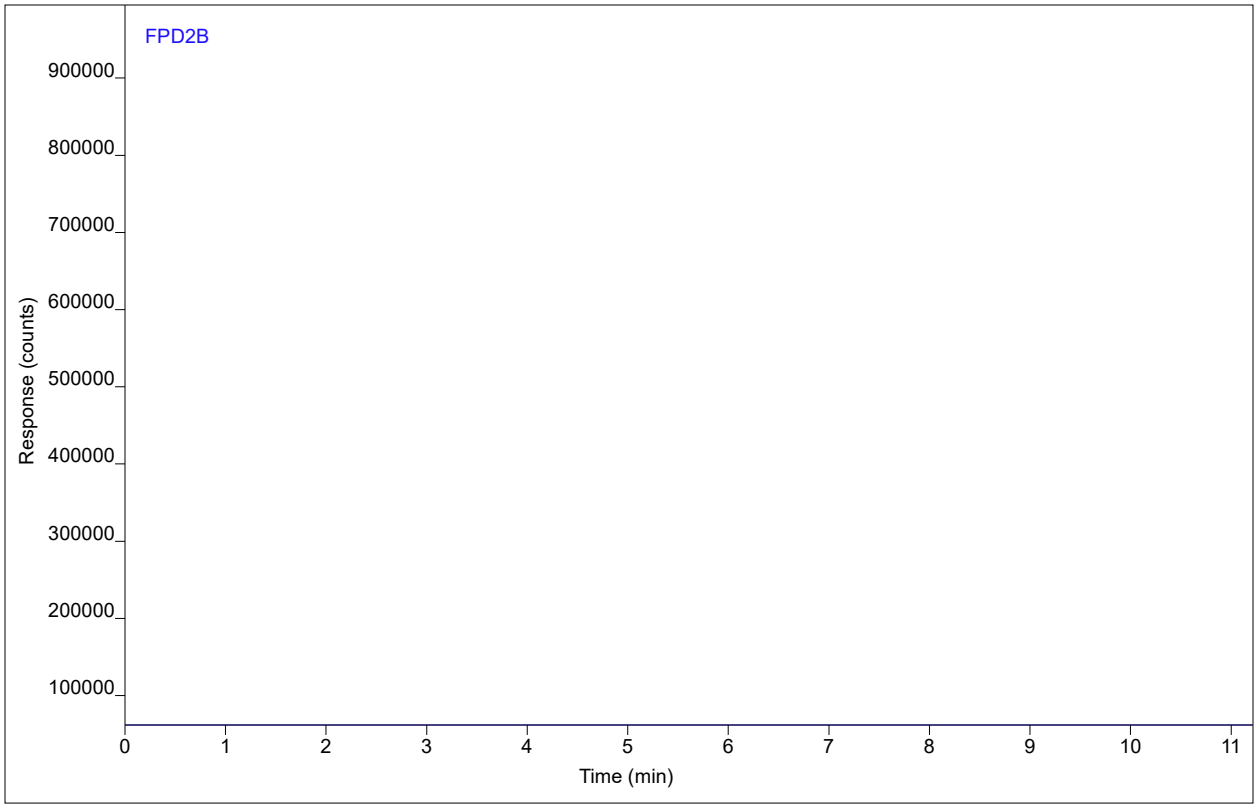
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0551 #MB
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1303.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 1:13 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



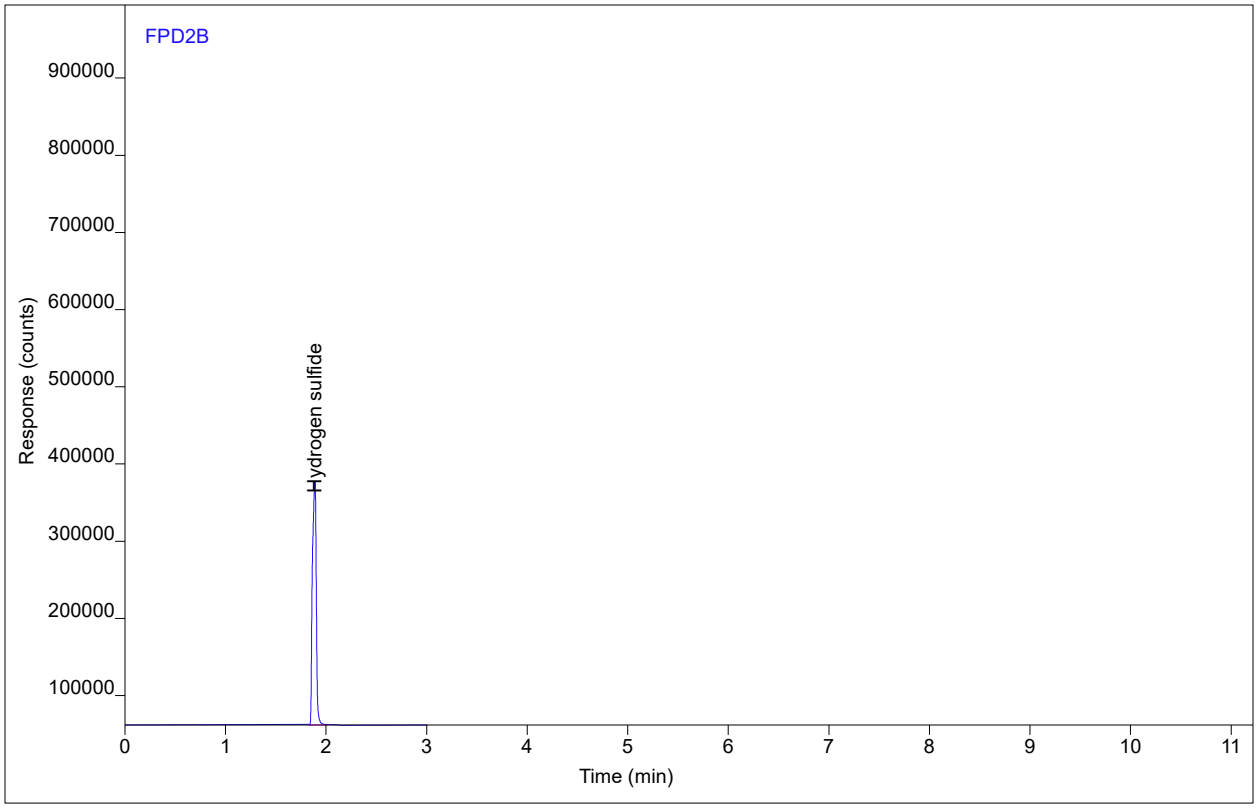
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	zeppoP0625 #LCS
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1401.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 1:30 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8_SHORT.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



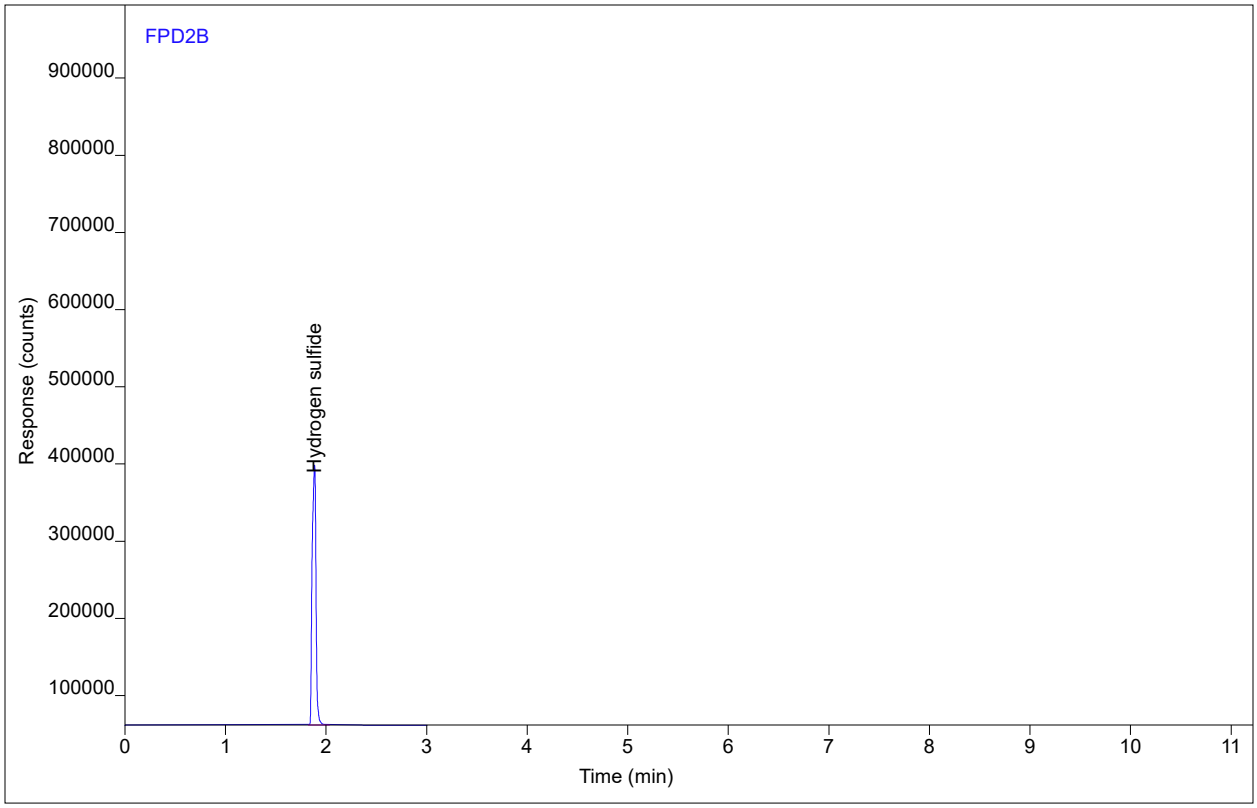
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BB	1.88	840569	299039	6.64197	1	6.64197	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #LCS
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1402.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 1:36 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8_SHORT.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



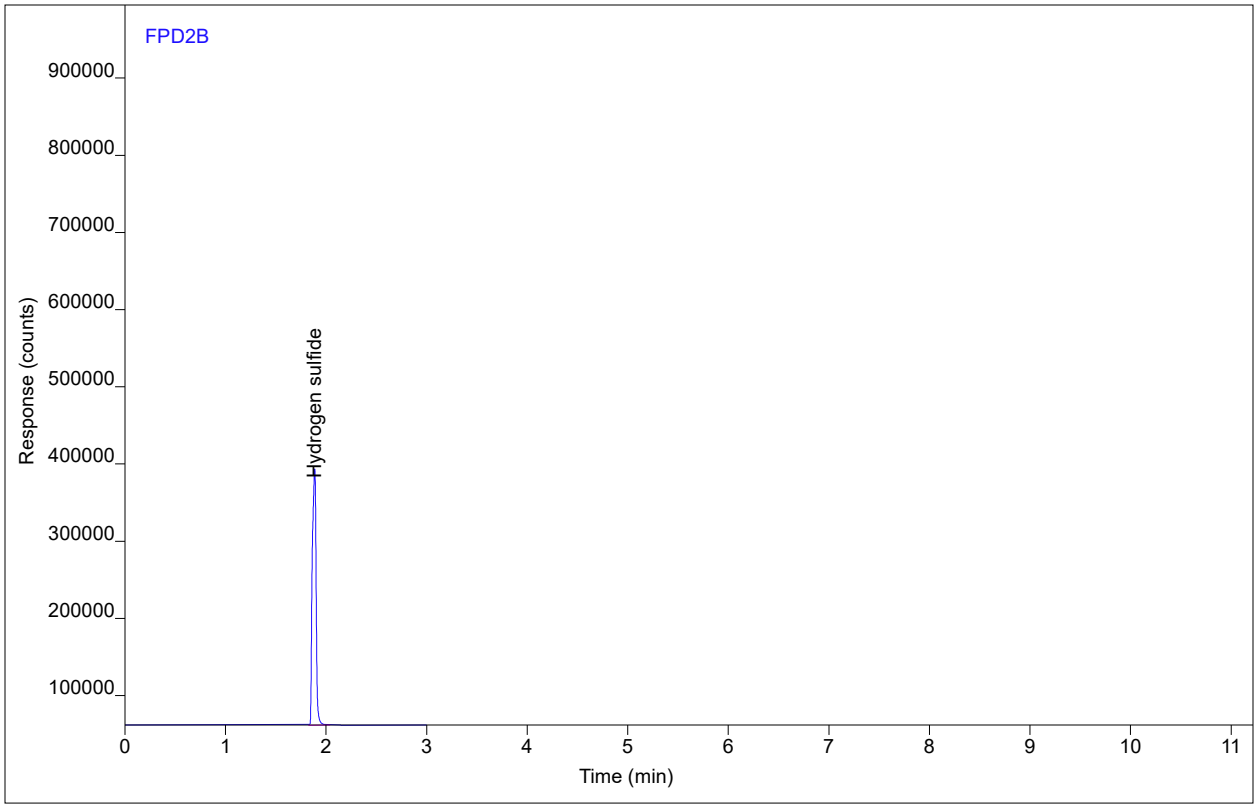
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BB	1.88	889242	329458	6.82842	1	6.82842	ppmv

Chromatogram Report

Sample Name	zeppoP0625 #LCS
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1403.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 1:41 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8_SHORT.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



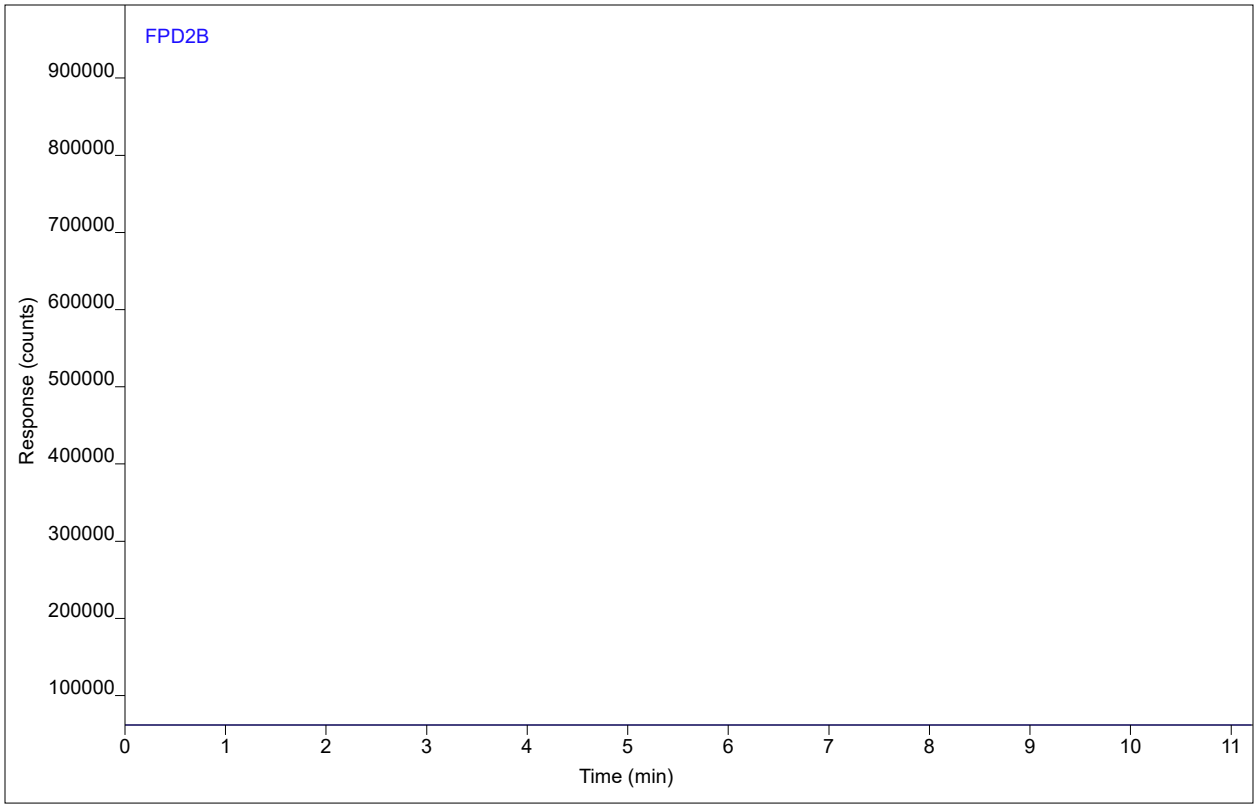
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BB	1.88	880841	319874	6.79662	1	6.79662	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Hot Wells.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1801.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 2:46 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



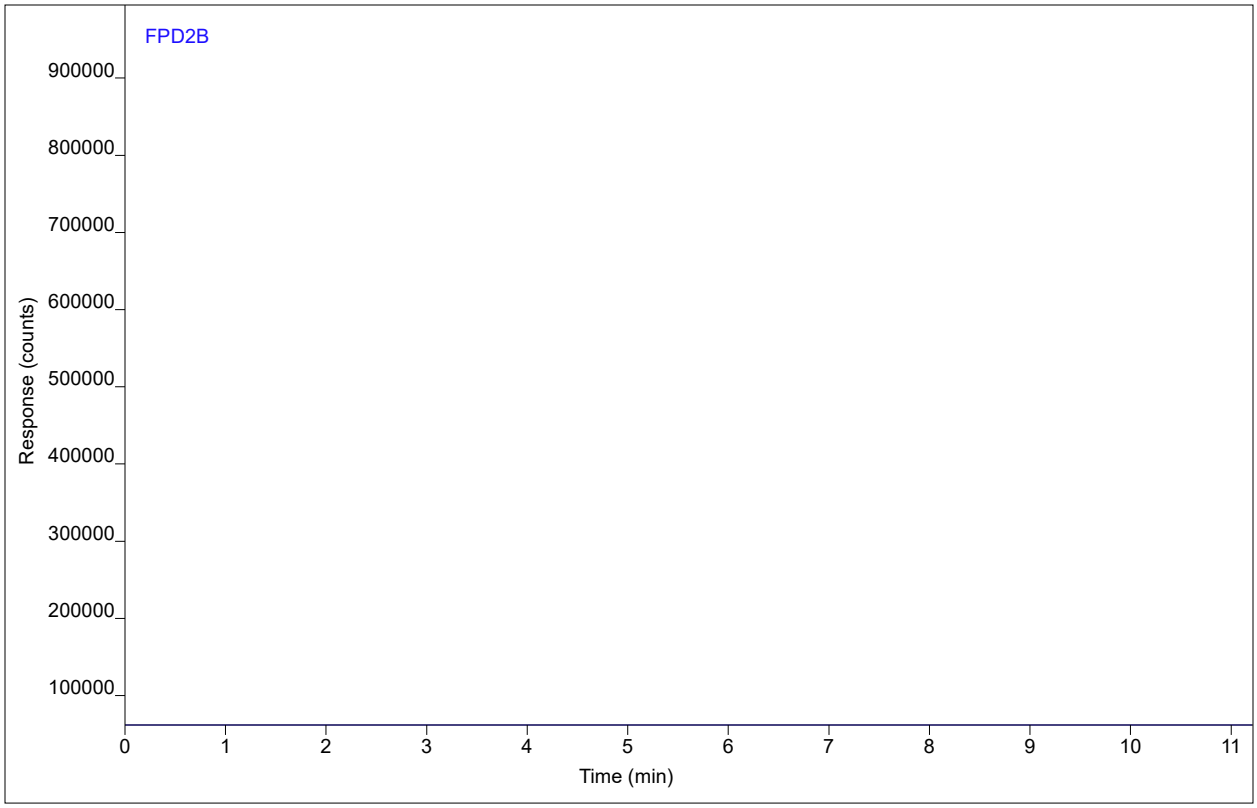
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	1121-078.Hot Wells.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1802.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 3:03 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



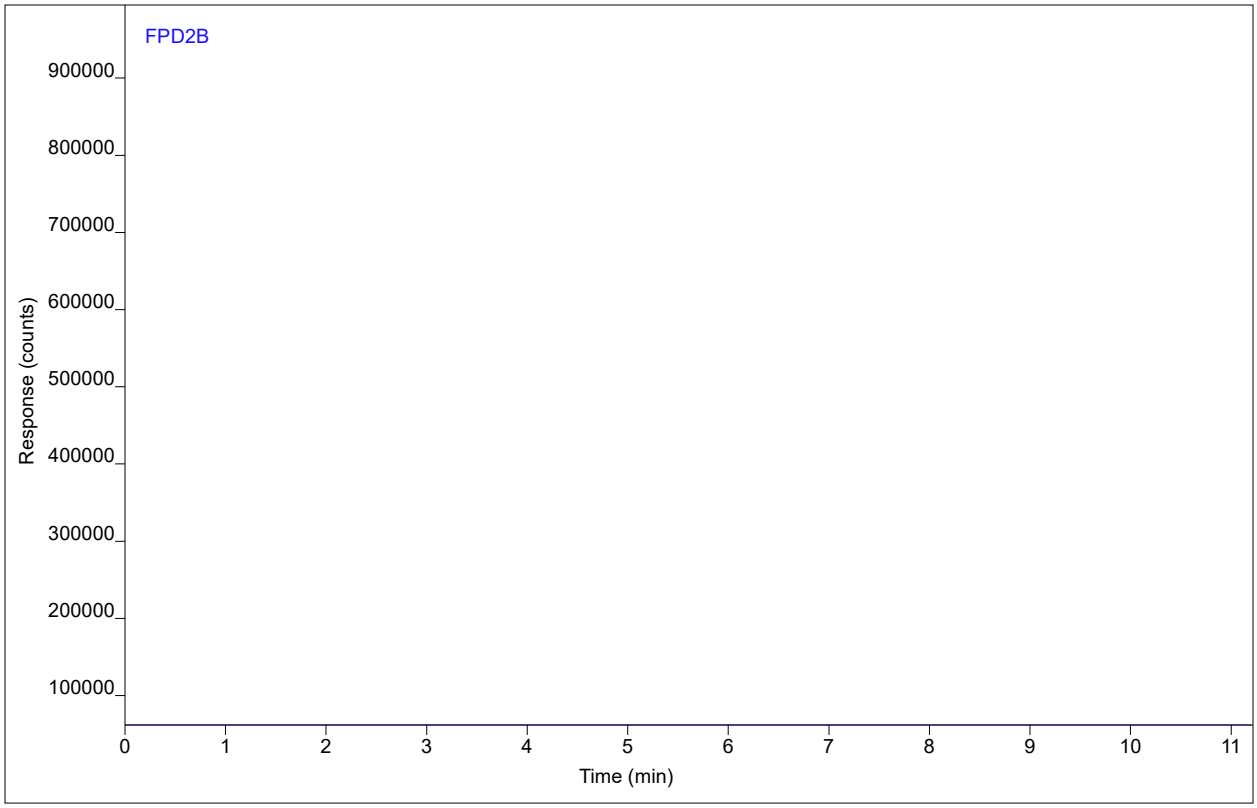
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	1121-078.Hot Wells.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1803.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 3:20 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



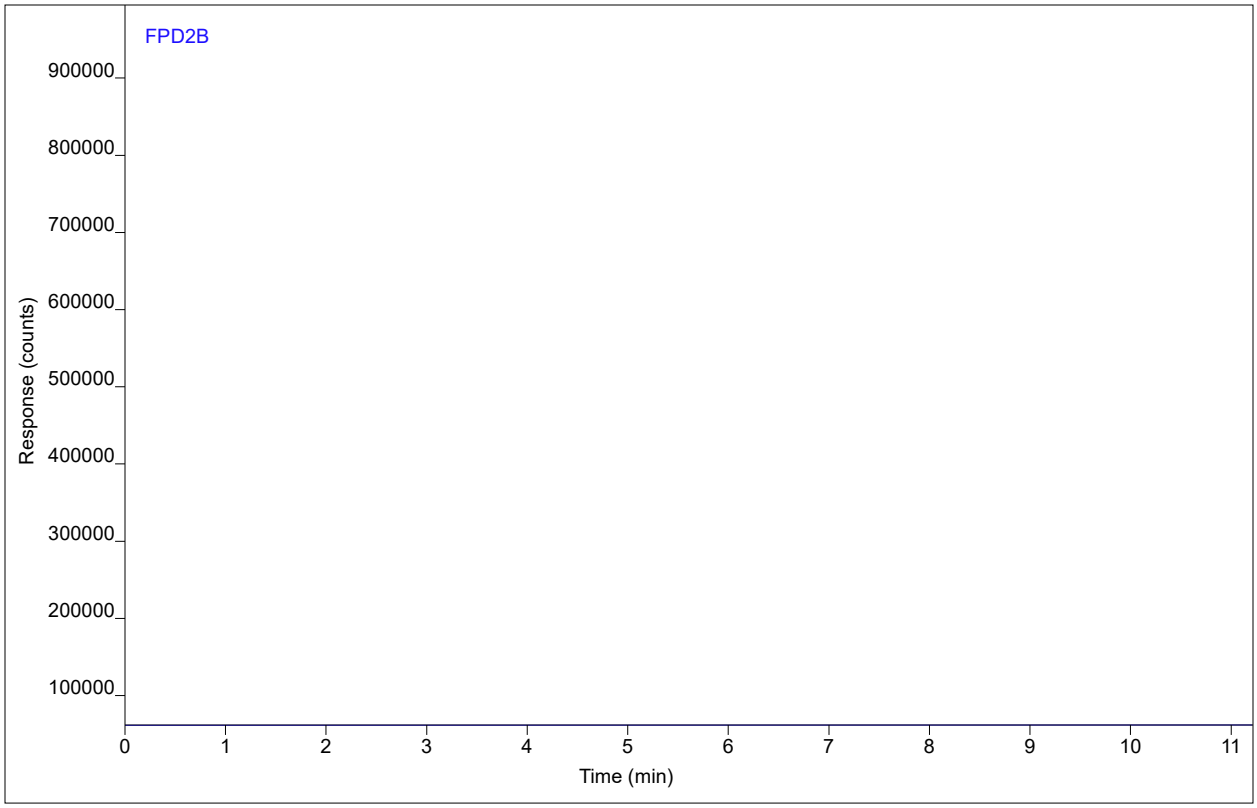
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Compost.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1901.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 3:37 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



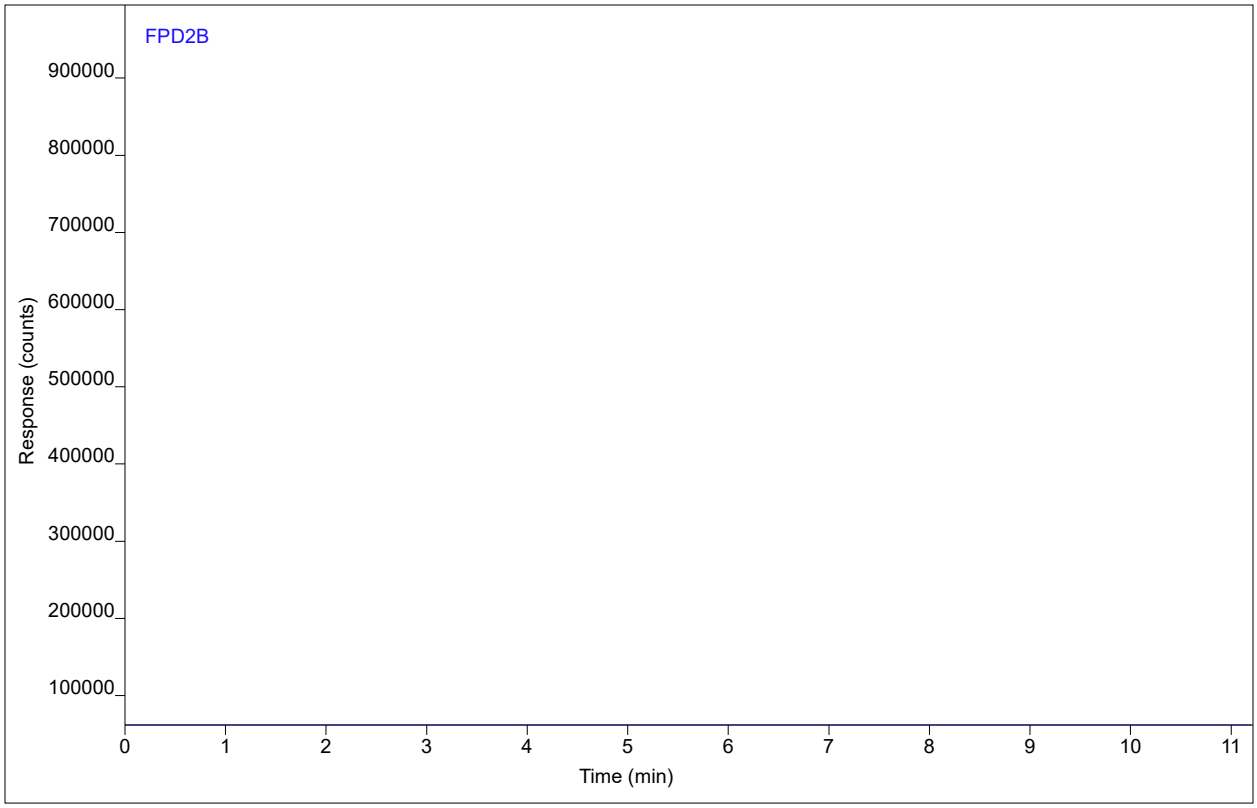
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Compost.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1902.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 3:54 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



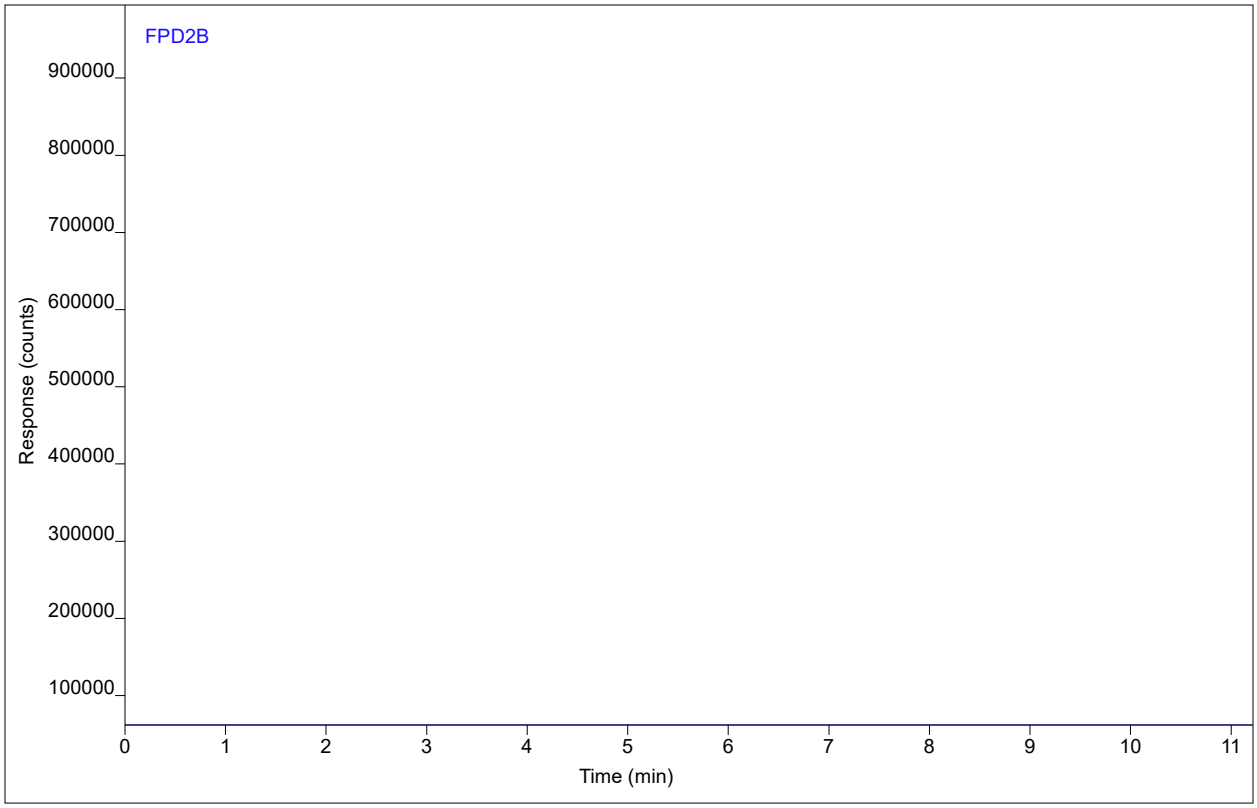
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Compost.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B1903.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 4:11 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



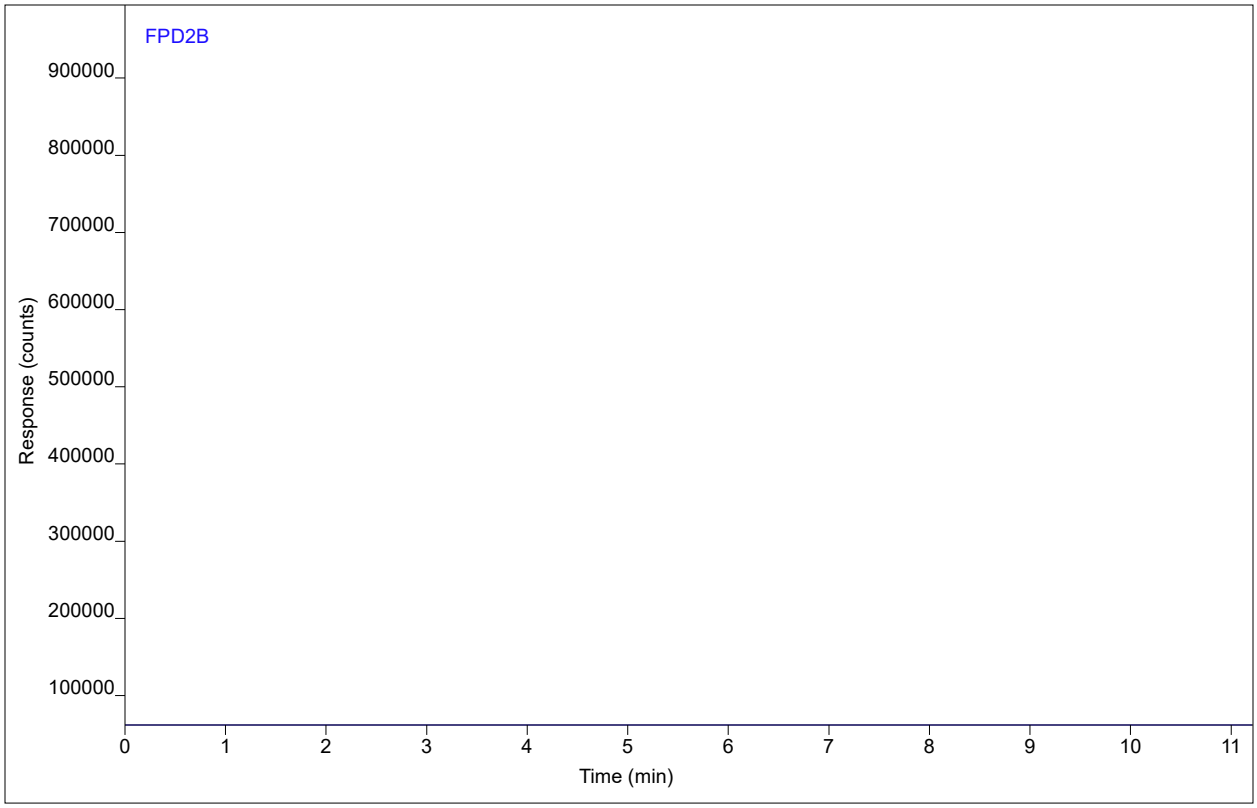
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	1121-078.Chimney.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2001.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 4:28 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



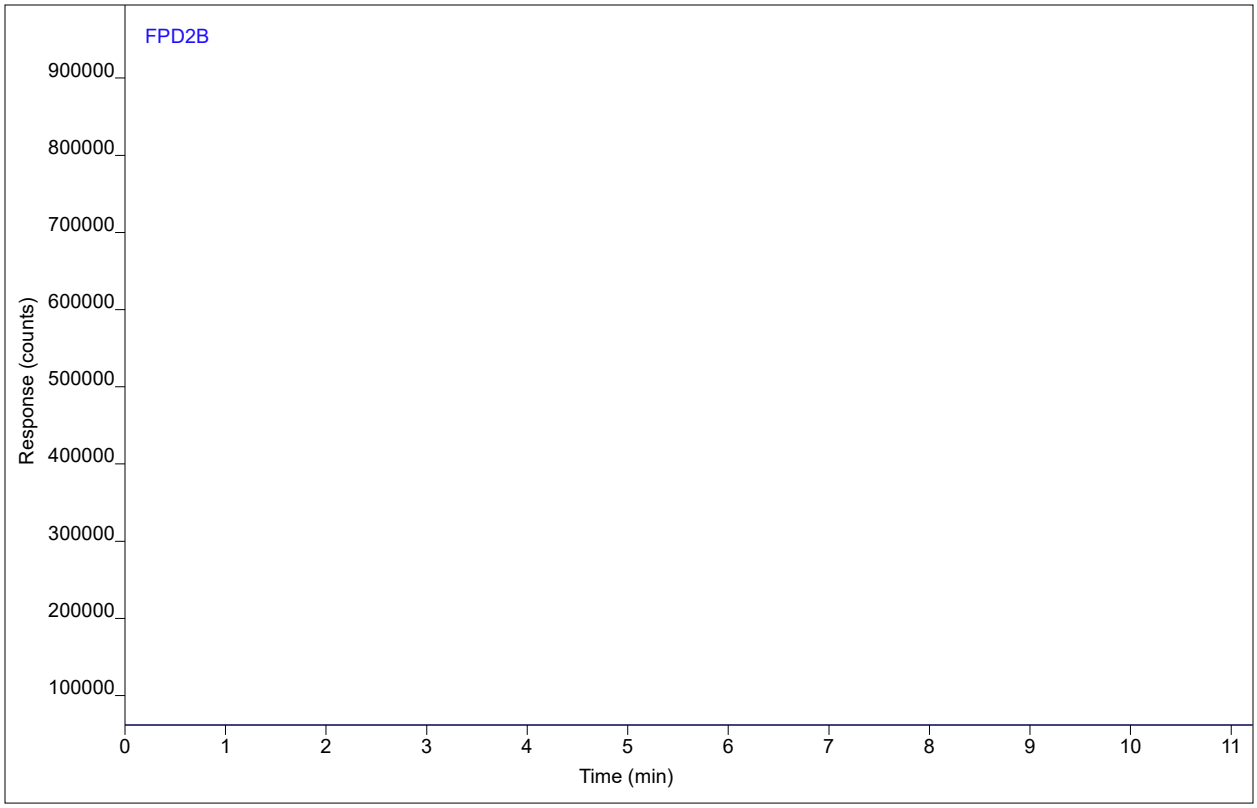
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	1121-078.Chimney.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2002.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 4:45 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



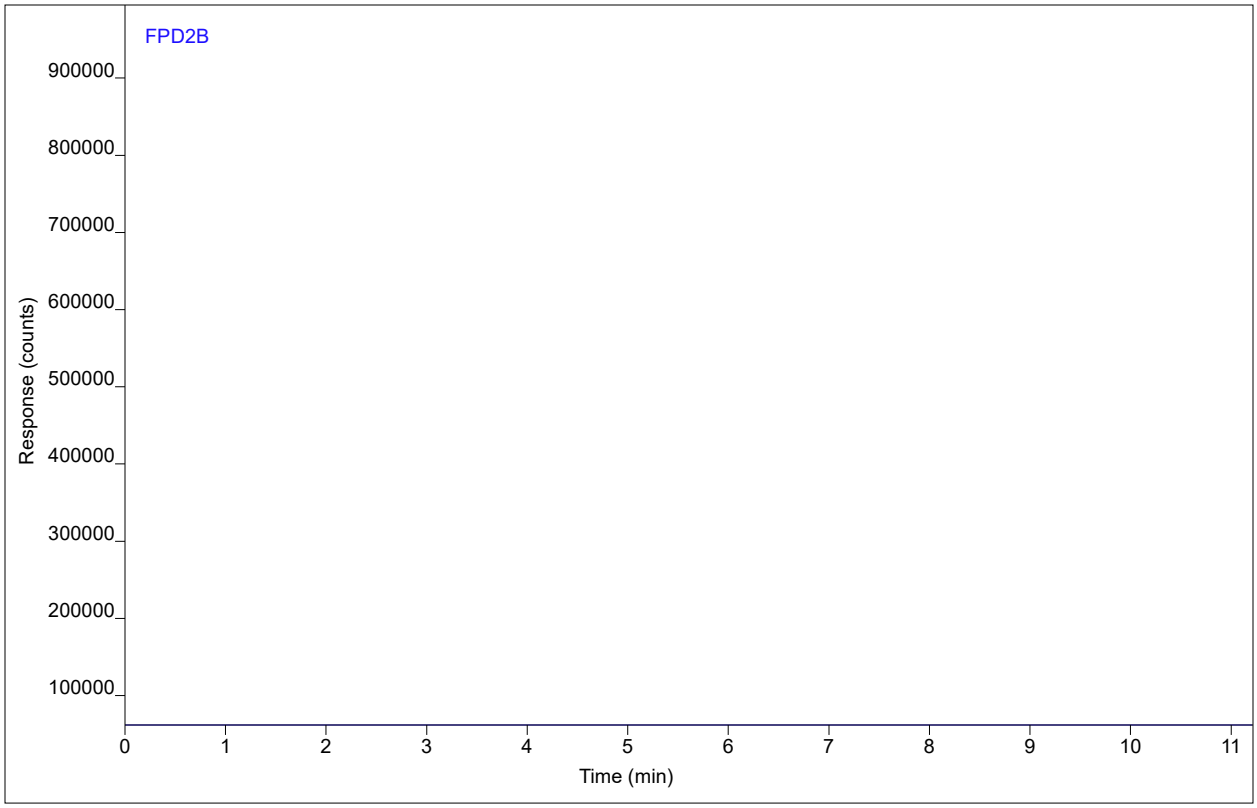
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Chimney.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2003.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 5:02 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



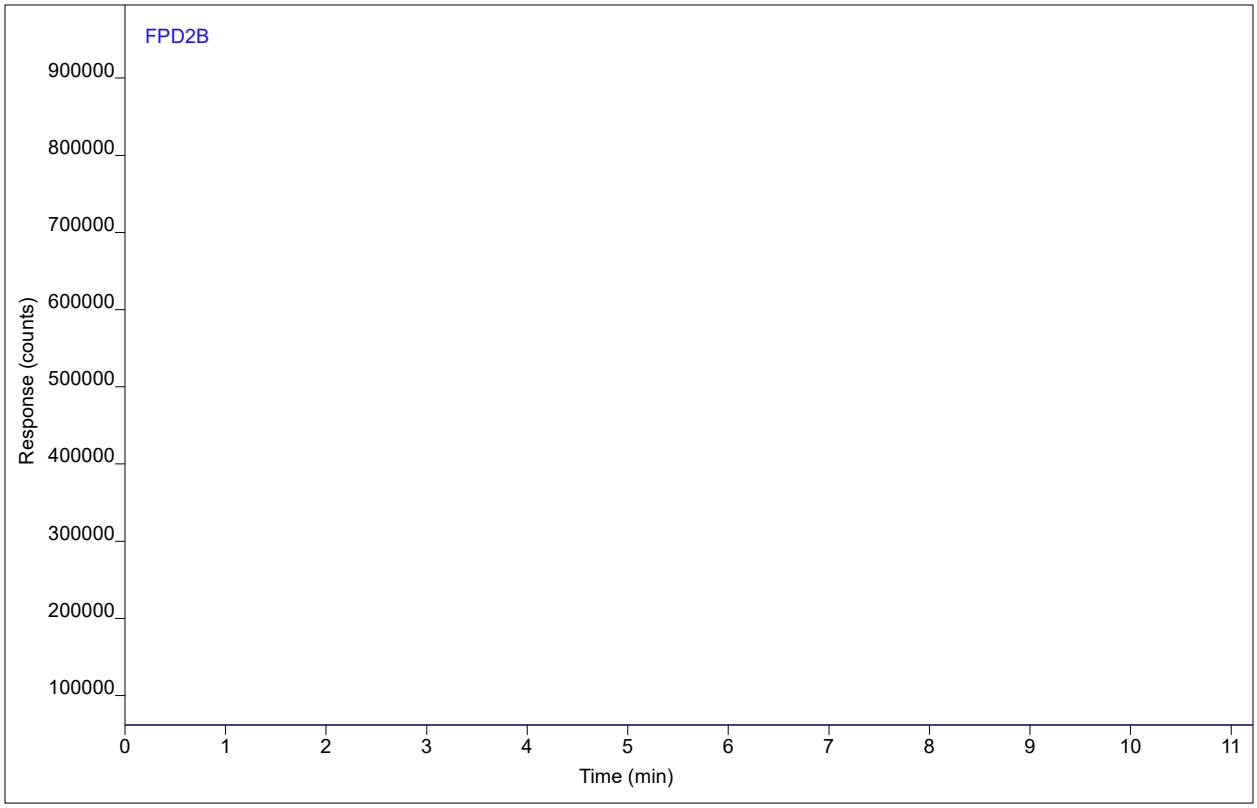
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Leachate.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2101.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 5:19 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



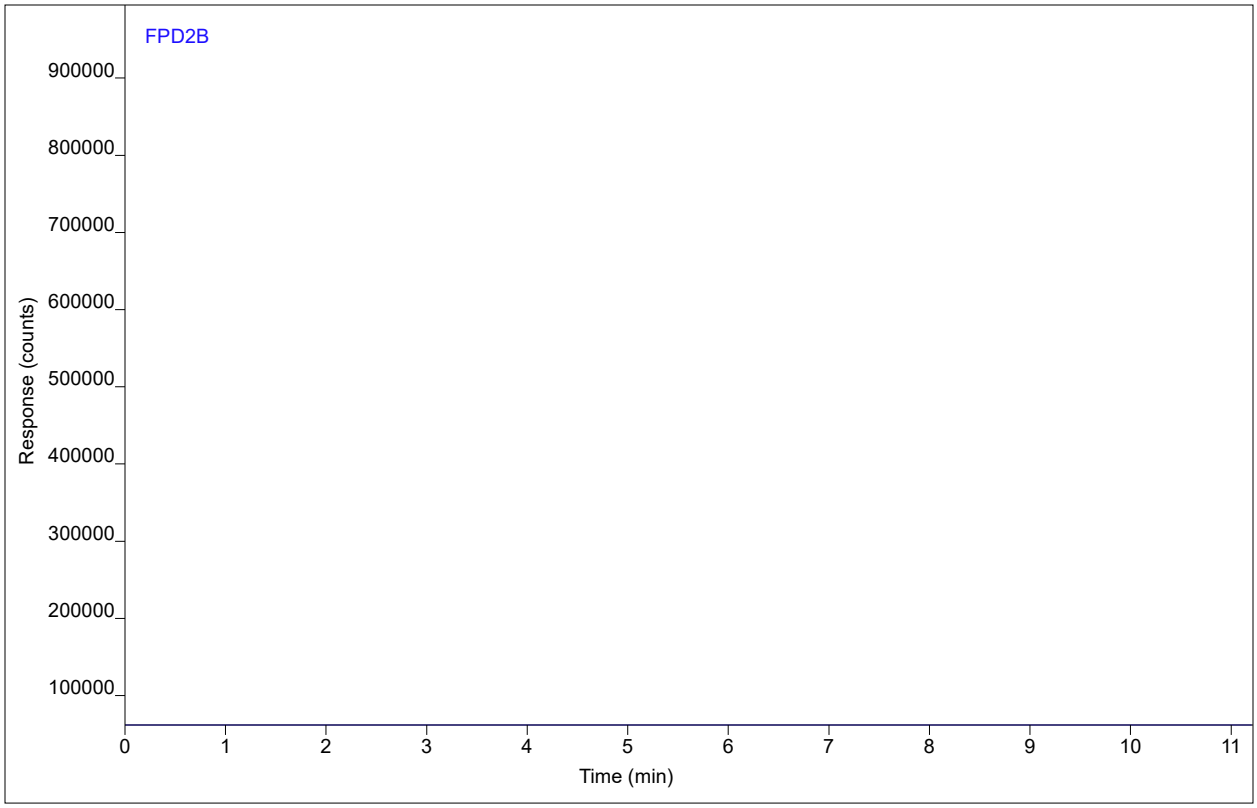
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Leachate.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2102.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 5:36 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



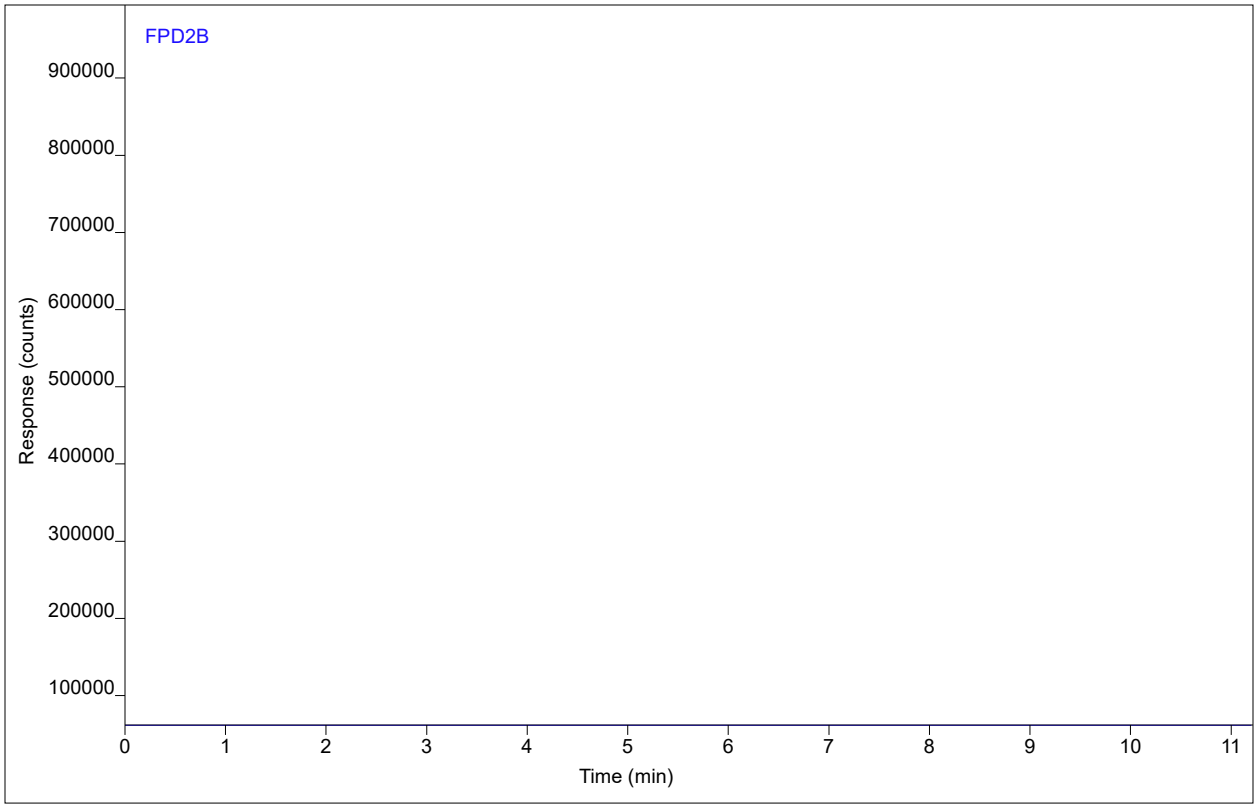
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	1121-078.Leachate.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2103.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 5:53 PM
File Modified	11/18/2021 10:15 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



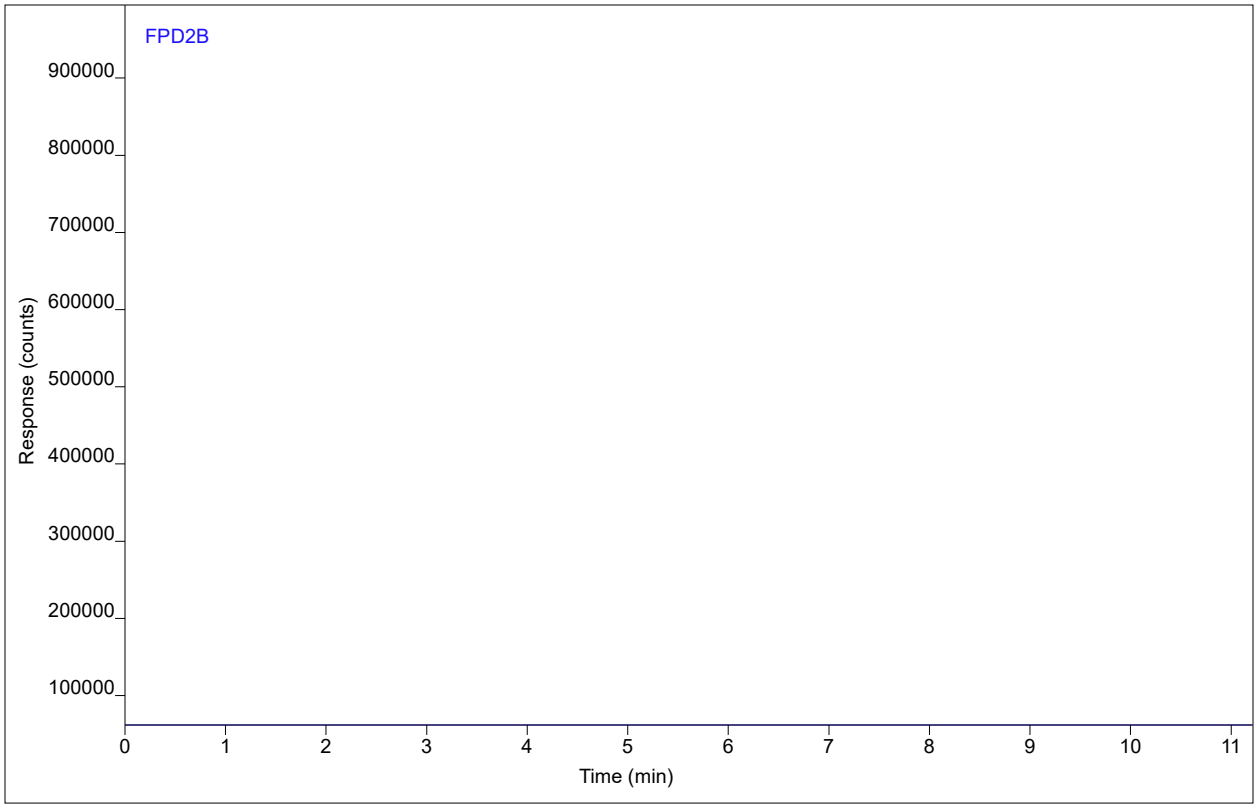
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Exiting.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2201.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 6:10 PM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	1 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



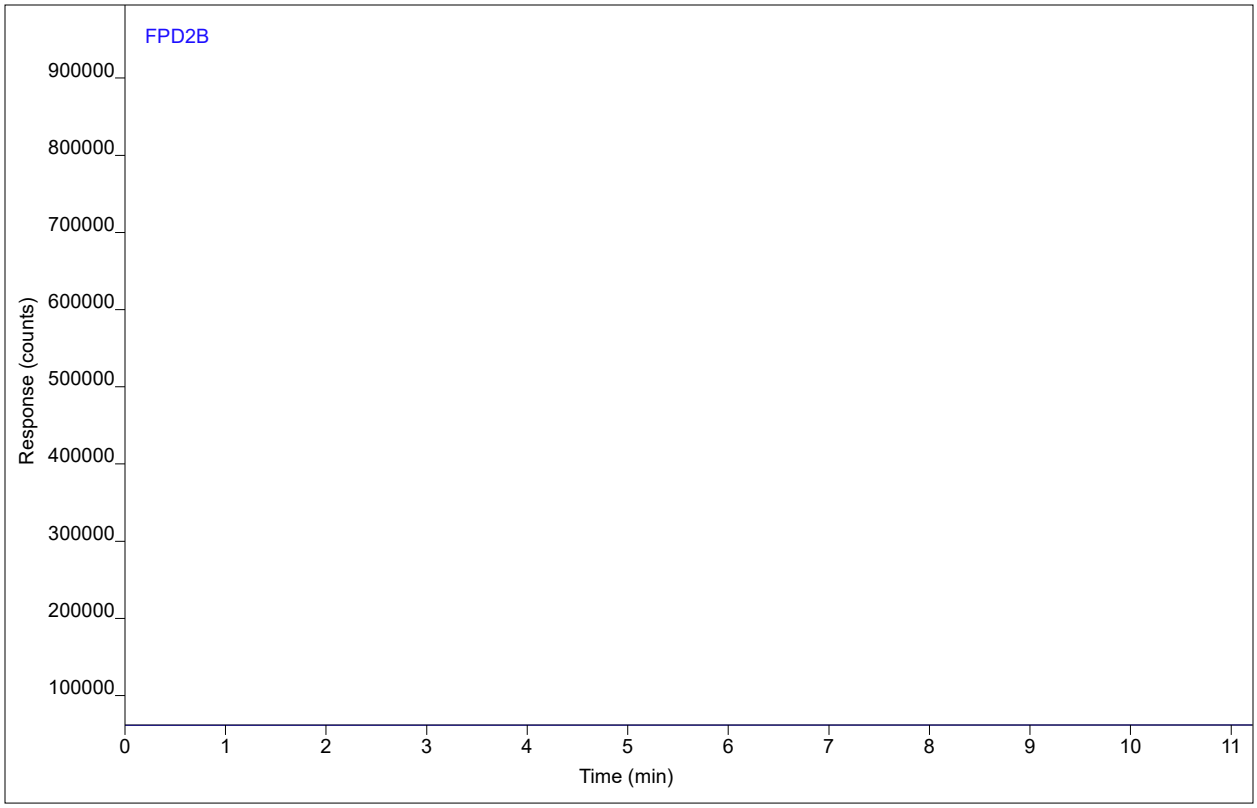
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Exiting.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2202.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 6:27 PM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



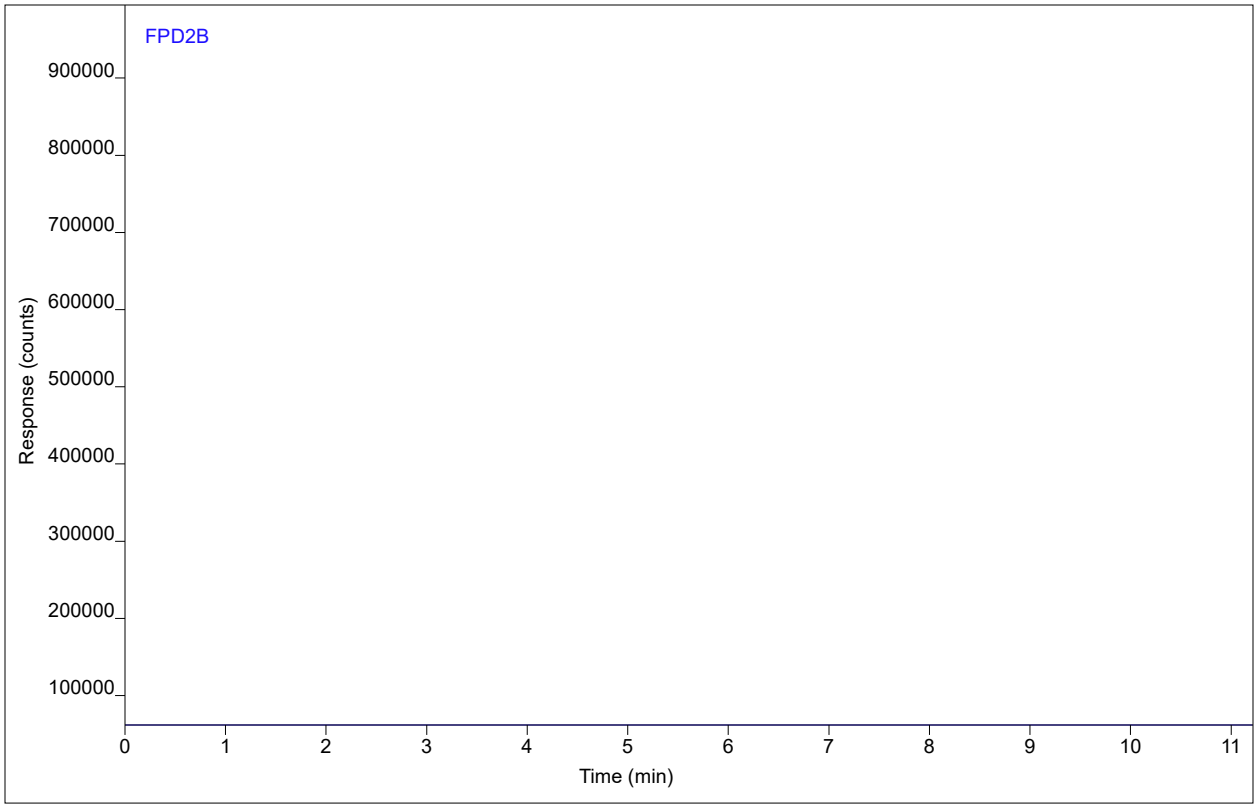
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Exiting.Bag
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2203.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/17/2021 6:44 PM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 3
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_1.M
Method Modified	11/17/2021 1:12 PM
Printed	11/18/2021 10:24 AM



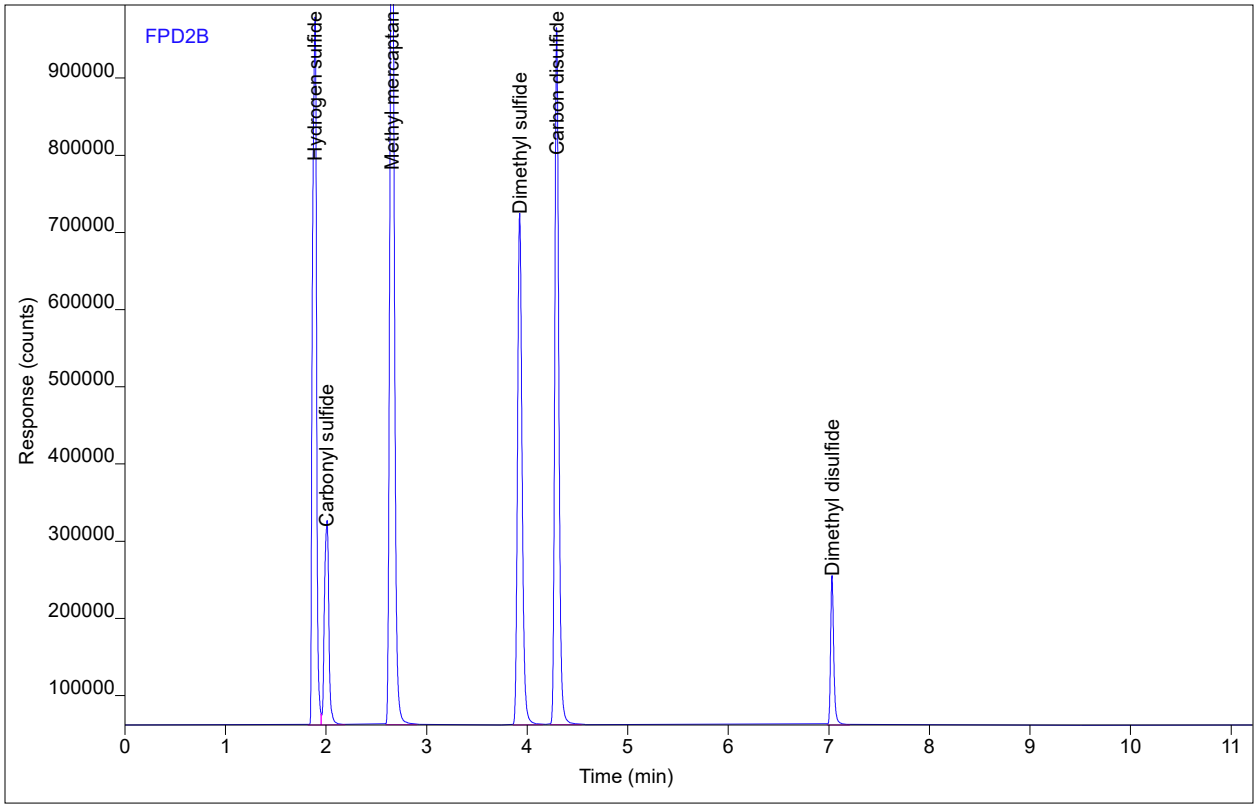
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide		(1.88)				1		
Carbonyl sulfide		(2.00)				1		
Methyl mercaptan		(2.65)				1		
Dimethyl sulfide		(3.93)				1		
Carbon disulfide		(4.29)				1		
Dimethyl disulfide		(7.03)				1		

Chromatogram Report

Sample Name	zeppoP0625 #5
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2402.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 1:19 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 5
Injection Volume	NA
Injection	2 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



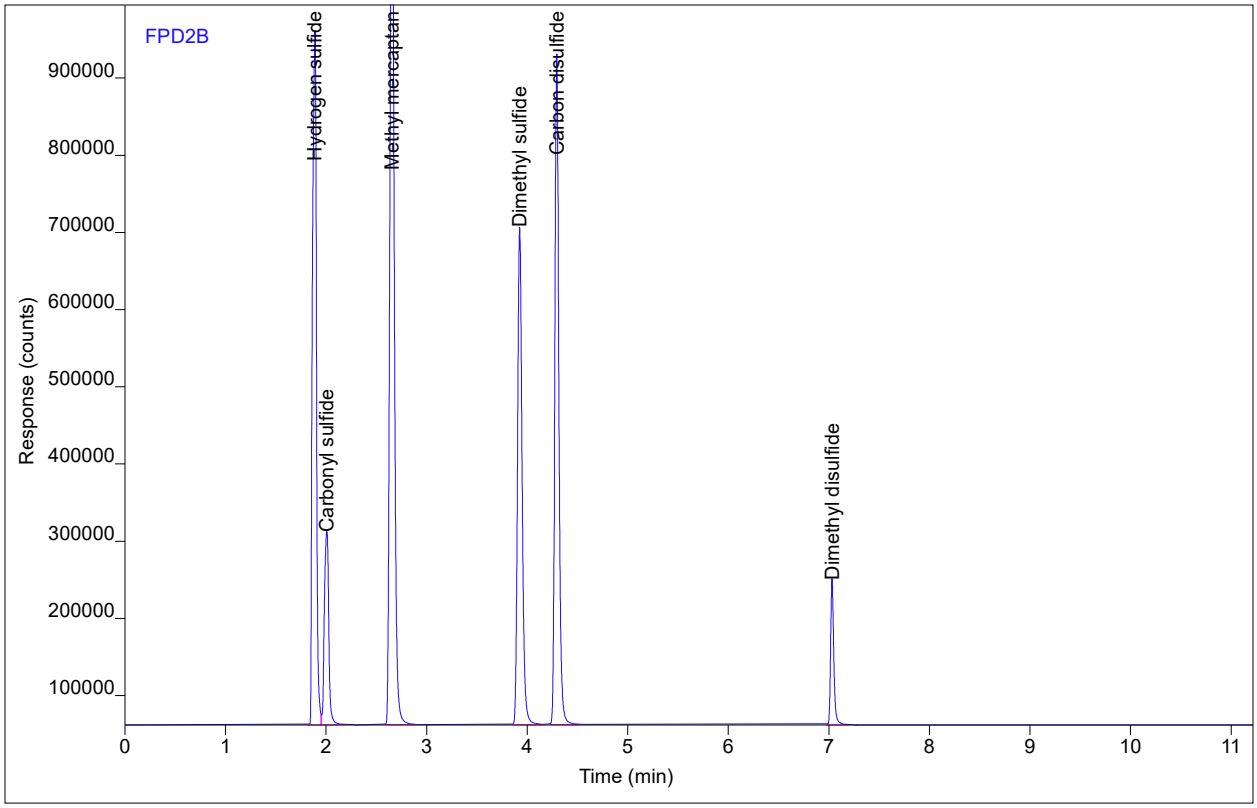
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.89	2560387	861527	10.2685	1	10.2685	ppmv
Carbonyl sulfide	VB	2.01	812408	253326	5.16383	1	5.16383	ppmv
Methyl mercaptan	BB	2.66	3653861	1162874	11.4326	1	11.4326	ppmv
Dimethyl sulfide	BB	3.93	2091295	659507	9.19283	1	9.19283	ppmv
Carbon disulfide	BB	4.29	2516850	891326	5.75919	1	5.75919	ppmv
Dimethyl disulfide	BB	7.03	424909	191985	1.77256	1	1.77256	ppmv

Chromatogram Report

Sample Name	zeppoP0625 #5
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2403.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 1:36 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 5
Injection Volume	NA
Injection	3 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



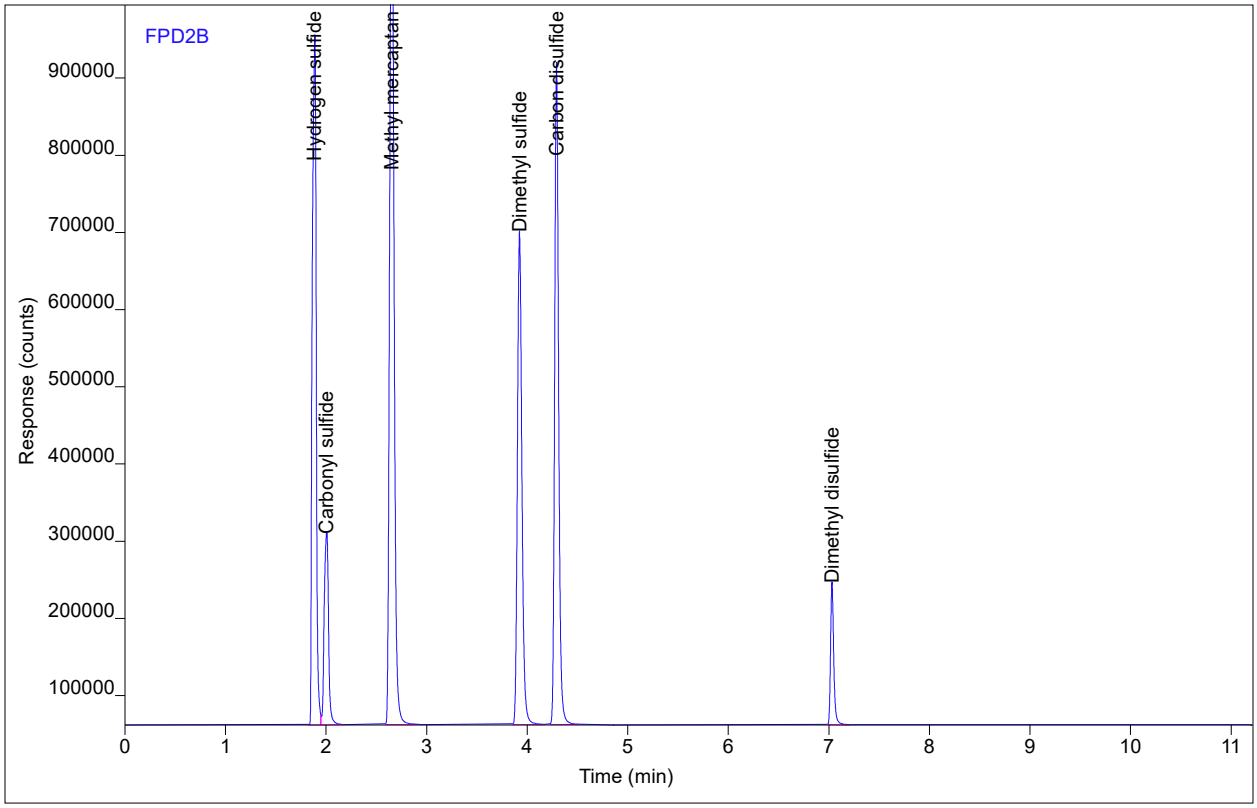
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	2484095	854176	10.1205	1	10.1205	ppmv
Carbonyl sulfide	VB	2.01	764824	246209	5.01656	1	5.01656	ppmv
Methyl mercaptan	BB	2.66	3545104	1140579	11.2675	1	11.2675	ppmv
Dimethyl sulfide	BB	3.93	2021345	640155	9.04402	1	9.04402	ppmv
Carbon disulfide	BB	4.29	2411111	863295	5.63943	1	5.63943	ppmv
Dimethyl disulfide	BB	7.03	413275	179542	1.74913	1	1.74913	ppmv

Chromatogram Report

Sample Name	zeppoP0625 #5
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	005B2404.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 1:53 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 5
Injection Volume	NA
Injection	4 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



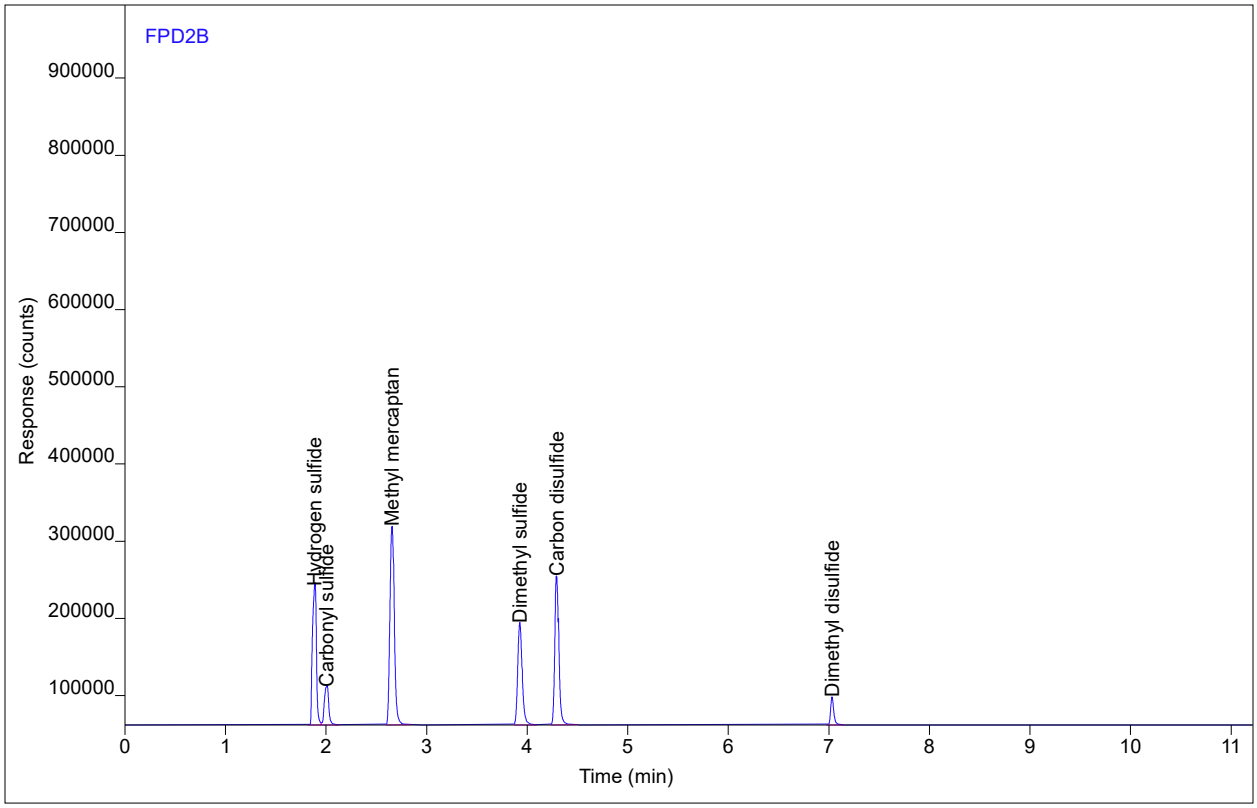
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	2437802	858425	10.0295	1	10.0295	ppmv
Carbonyl sulfide	VB	2.00	749558	245694	4.96830	1	4.96830	ppmv
Methyl mercaptan	BB	2.65	3484418	1134247	11.1743	1	11.1743	ppmv
Dimethyl sulfide	BB	3.92	1982952	634158	8.96120	1	8.96120	ppmv
Carbon disulfide	BB	4.29	2351980	849257	5.57129	1	5.57129	ppmv
Dimethyl disulfide	BB	7.03	403937	183319	1.73007	1	1.73007	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #4
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	004B2502.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 2:27 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 4
Injection Volume	NA
Injection	2 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



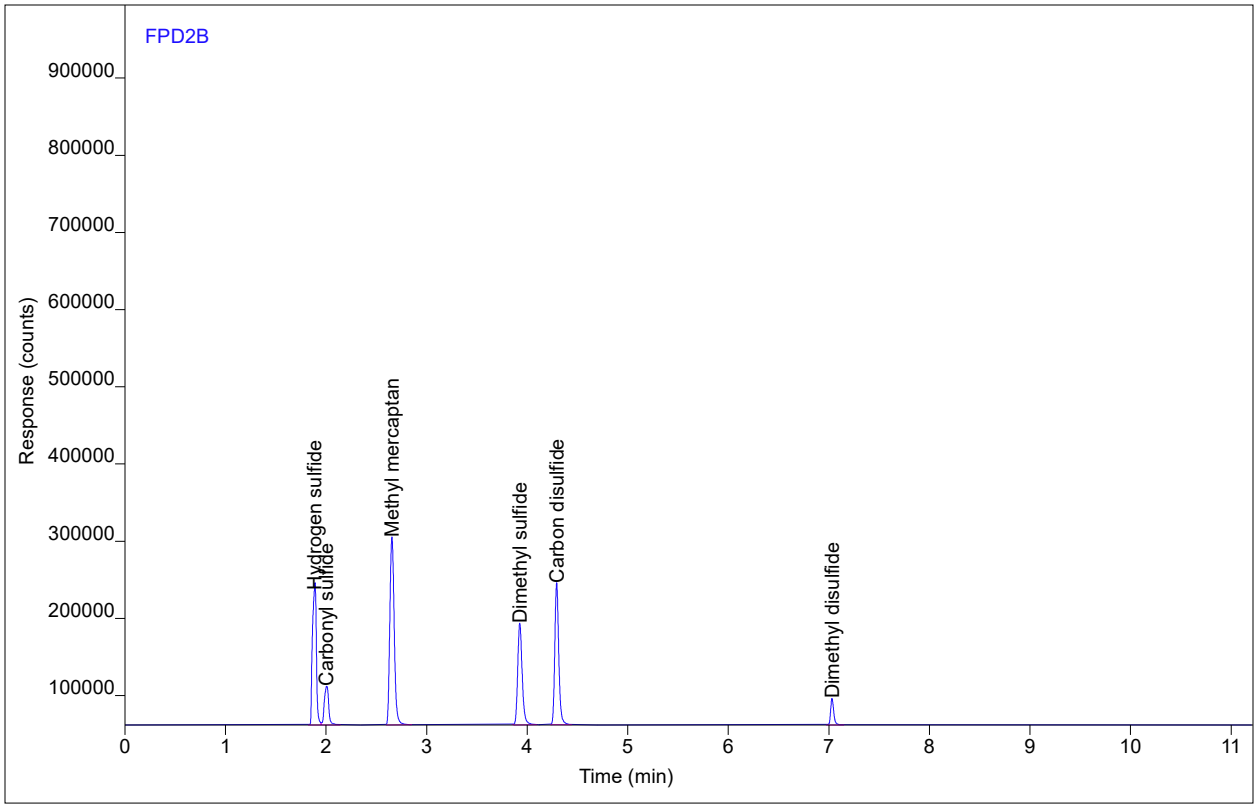
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	501652	175538	4.69460	1	4.69460	ppmv
Carbonyl sulfide	VB	2.01	153919	48967.9	2.32606	1	2.32606	ppmv
Methyl mercaptan	BB	2.66	795613	256692	5.48860	1	5.48860	ppmv
Dimethyl sulfide	BB	3.93	411423	130552	4.21419	1	4.21419	ppmv
Carbon disulfide	BB	4.29	549126	189150	2.73306	1	2.73306	ppmv
Dimethyl disulfide	BB	7.03	80024.7	36438.0	0.79629	1	0.79629	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #4
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	004B2503.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 2:44 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 4
Injection Volume	NA
Injection	3 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



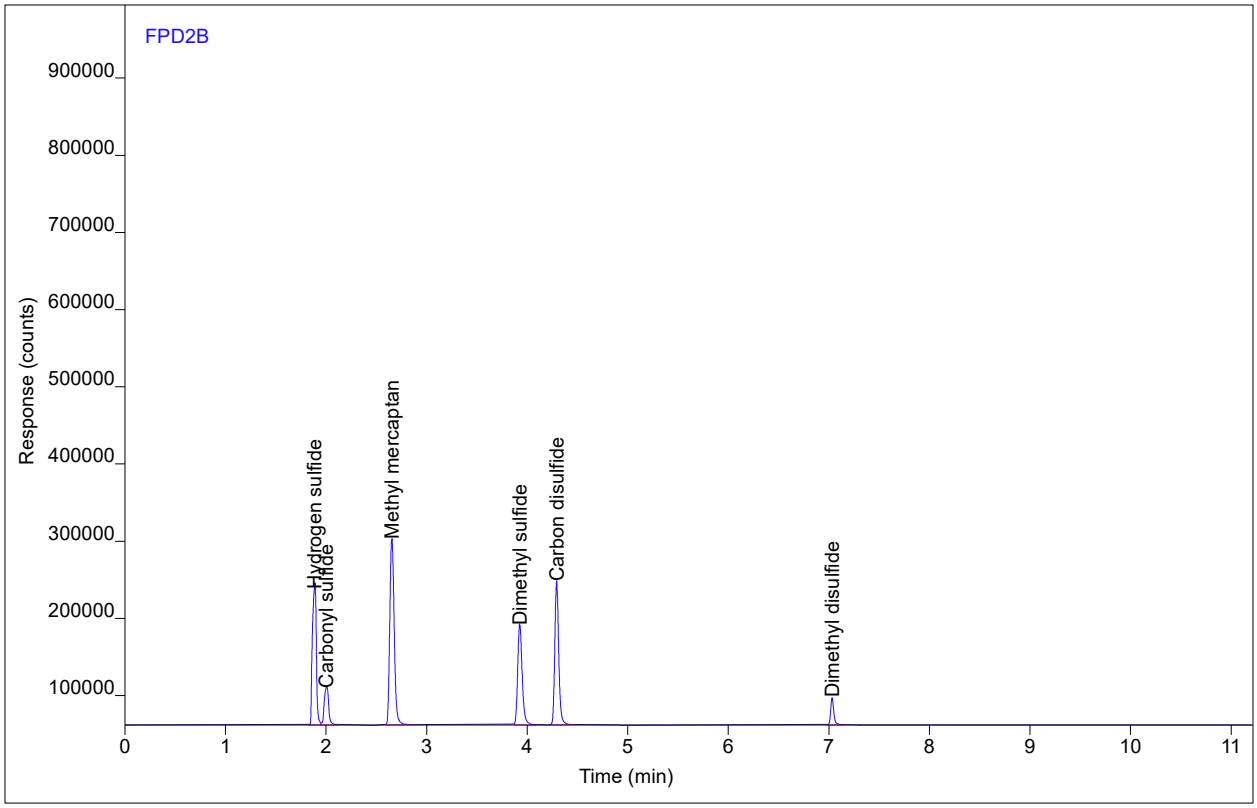
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	497293	173823	4.67497	1	4.67497	ppmv
Carbonyl sulfide	VB	2.00	151918	49448.4	2.31151	1	2.31151	ppmv
Methyl mercaptan	BB	2.66	738972	241886	5.29691	1	5.29691	ppmv
Dimethyl sulfide	BB	3.93	407736	129952	4.19603	1	4.19603	ppmv
Carbon disulfide	BB	4.29	501216	181357	2.61359	1	2.61359	ppmv
Dimethyl disulfide	BB	7.03	75014.5	32796.0	0.77199	1	0.77199	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #4
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	004B2504.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 3:01 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 4
Injection Volume	NA
Injection	4 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



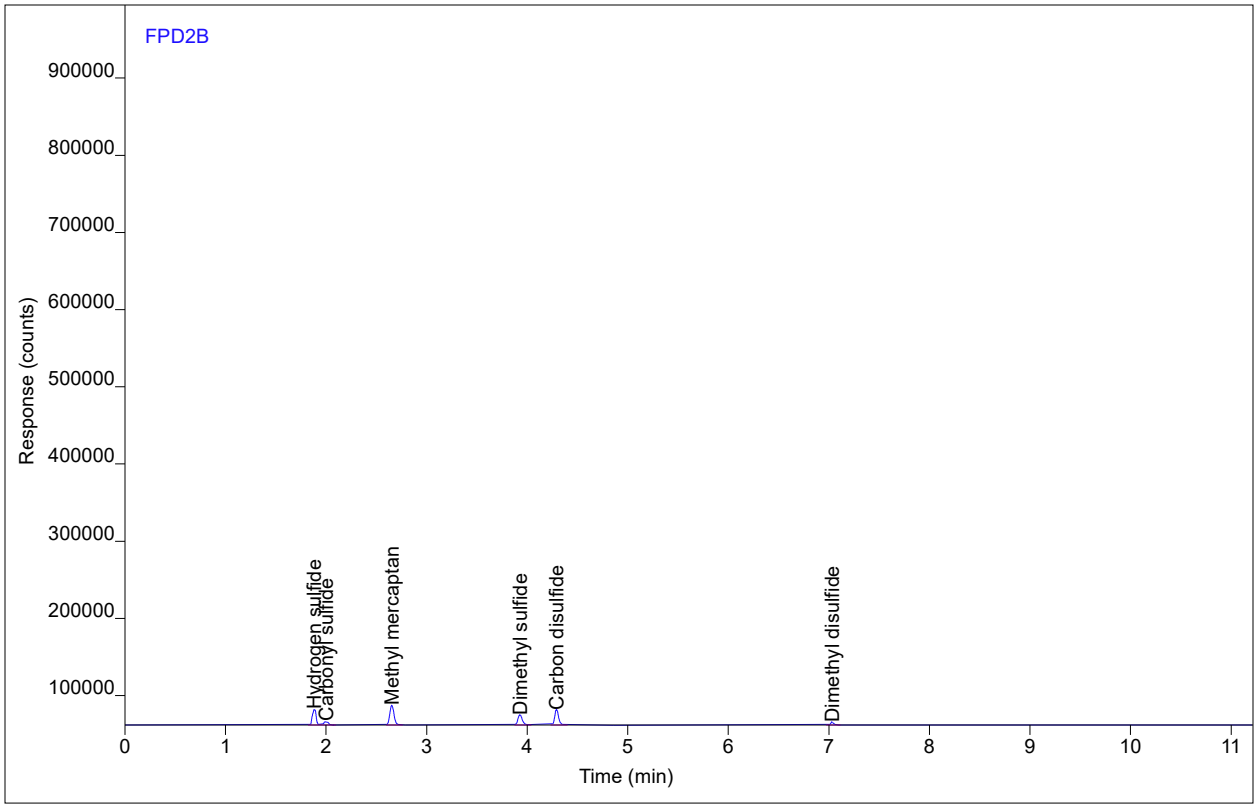
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	497772	175525	4.67714	1	4.67714	ppmv
Carbonyl sulfide	VB	2.00	150476	49038.5	2.30097	1	2.30097	ppmv
Methyl mercaptan	BB	2.66	735389	240001	5.28453	1	5.28453	ppmv
Dimethyl sulfide	BB	3.93	405830	128659	4.18661	1	4.18661	ppmv
Carbon disulfide	BB	4.29	505502	181655	2.62451	1	2.62451	ppmv
Dimethyl disulfide	BB	7.03	76787.2	33992.2	0.78069	1	0.78069	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #3
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	003B2602.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 3:35 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 3
Injection Volume	NA
Injection	2 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



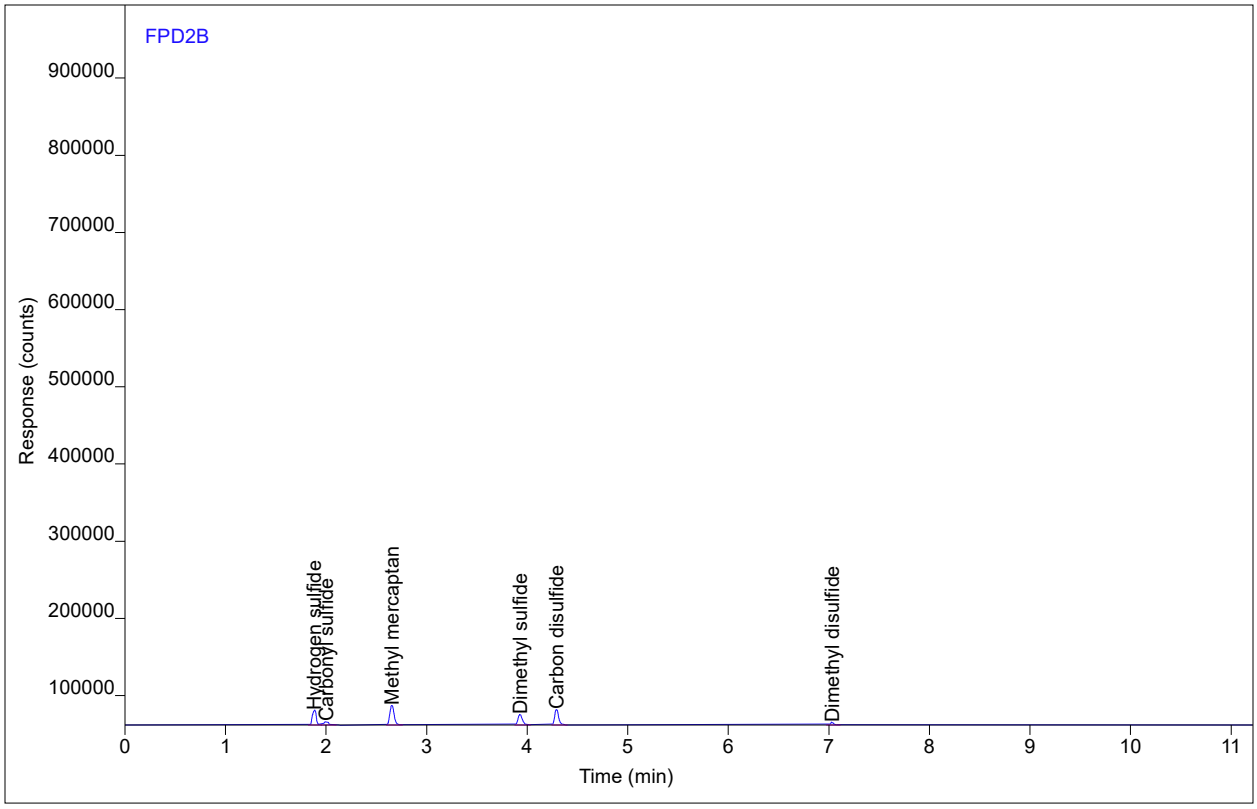
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	52704.9	20262.4	1.59123	1	1.59123	ppmv
Carbonyl sulfide	VB	2.00	15387.5	5111.47	0.77121	1	0.77121	ppmv
Methyl mercaptan	BB	2.65	74813.2	25439.0	1.75889	1	1.75889	ppmv
Dimethyl sulfide	BB	3.93	41691.3	13210.2	1.40529	1	1.40529	ppmv
Carbon disulfide	BB	4.29	53880.0	19939.0	0.87704	1	0.87704	ppmv
Dimethyl disulfide	BB	7.03	8233.67	3515.39	0.26773	1	0.26773	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #3
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	003B2603.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 3:52 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 3
Injection Volume	NA
Injection	3 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



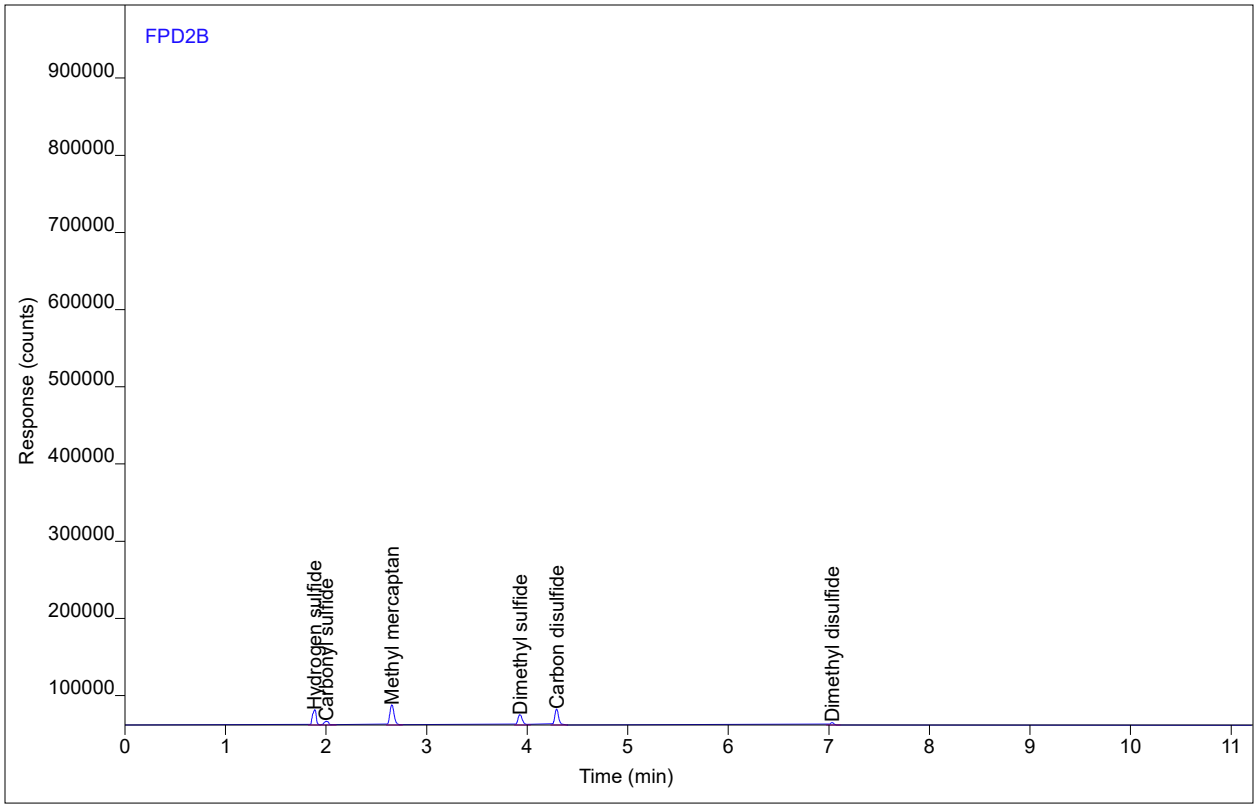
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	51548.5	18908.1	1.57437	1	1.57437	ppmv
Carbonyl sulfide	VB	2.00	15396.1	5215.47	0.77141	1	0.77141	ppmv
Methyl mercaptan	BB	2.66	77133.2	26245.1	1.78493	1	1.78493	ppmv
Dimethyl sulfide	BB	3.93	41947.1	13743.9	1.40942	1	1.40942	ppmv
Carbon disulfide	BB	4.29	56952.8	20897.3	0.90118	1	0.90118	ppmv
Dimethyl disulfide	BB	7.03	8838.69	3660.54	0.27699	1	0.27699	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #3
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	003B2604.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 4:09 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 3
Injection Volume	NA
Injection	4 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



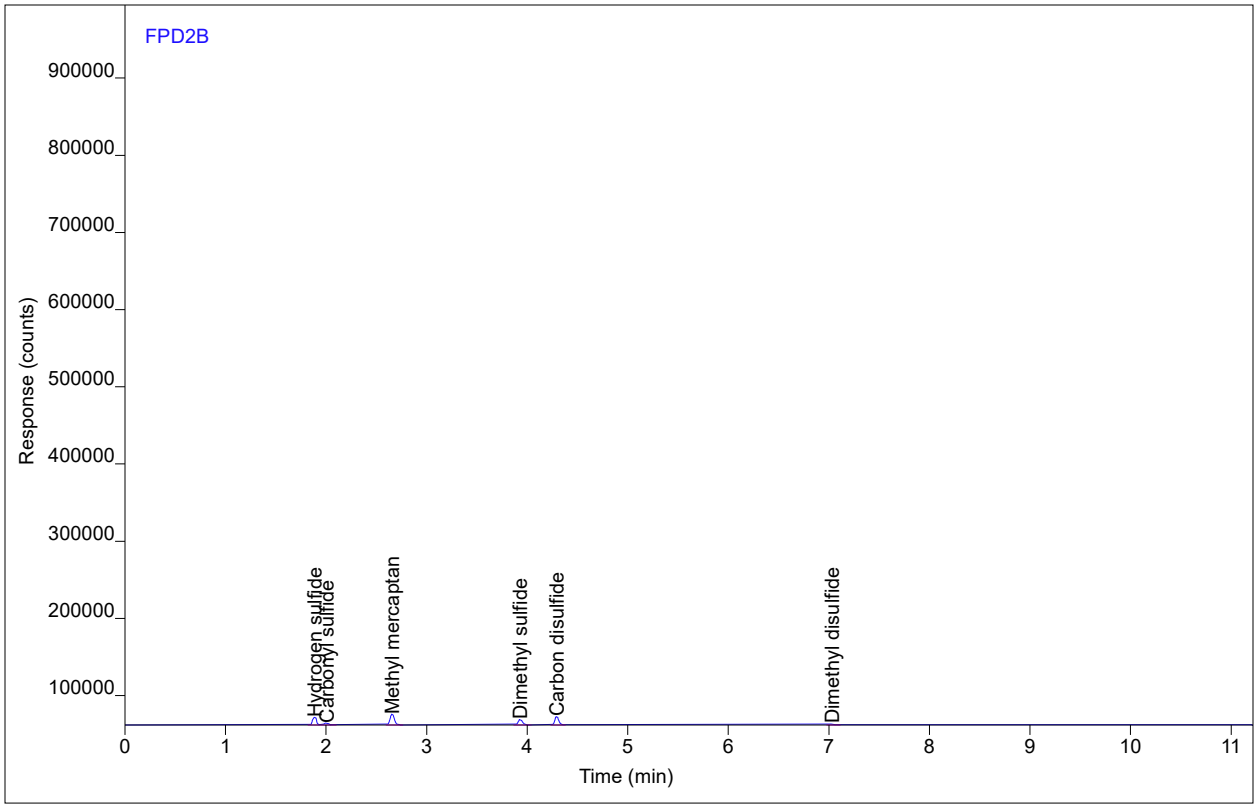
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	52287.9	19237.2	1.58518	1	1.58518	ppmv
Carbonyl sulfide	VB	2.00	15787.7	4937.31	0.78076	1	0.78076	ppmv
Methyl mercaptan	BB	2.66	77687.1	25954.5	1.79109	1	1.79109	ppmv
Dimethyl sulfide	BB	3.93	42135.2	13420.8	1.41245	1	1.41245	ppmv
Carbon disulfide	BB	4.29	55129.3	20292.2	0.88693	1	0.88693	ppmv
Dimethyl disulfide	BB	7.03	8202.92	3435.64	0.26725	1	0.26725	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #2
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	002B2702.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 4:43 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 2
Injection Volume	NA
Injection	2 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



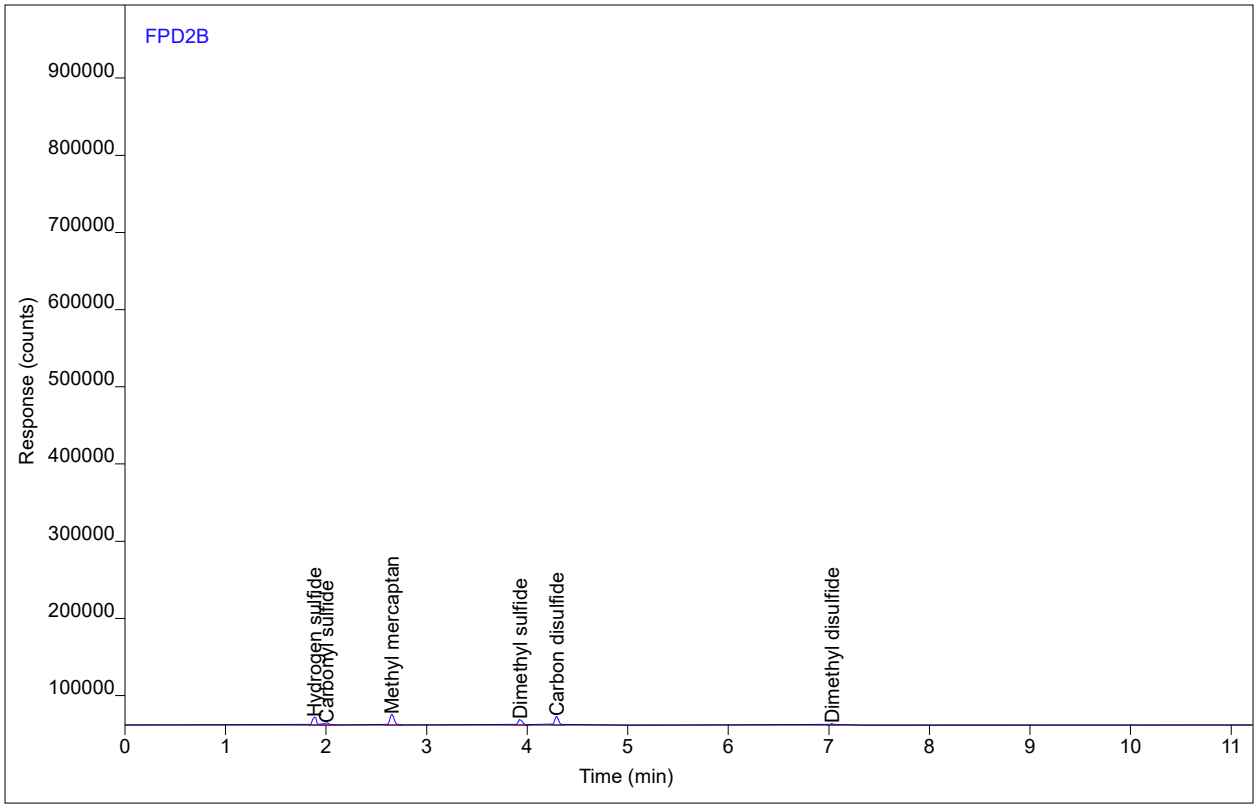
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.89	28735.3	10765.0	1.18917	1	1.18917	ppmv
Carbonyl sulfide	VB	2.01	8794.89	2968.57	0.58980	1	0.58980	ppmv
Methyl mercaptan	BB	2.66	42273.2	13982.0	1.33629	1	1.33629	ppmv
Dimethyl sulfide	BB	3.93	24025.4	7621.01	1.07879	1	1.07879	ppmv
Carbon disulfide	BB	4.29	31255.8	11396.9	0.67178	1	0.67178	ppmv
Dimethyl disulfide	BB	7.03	4670.54	2153.77	0.20402	1	0.20402	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #2
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	002B2703.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 5:00 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 2
Injection Volume	NA
Injection	3 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



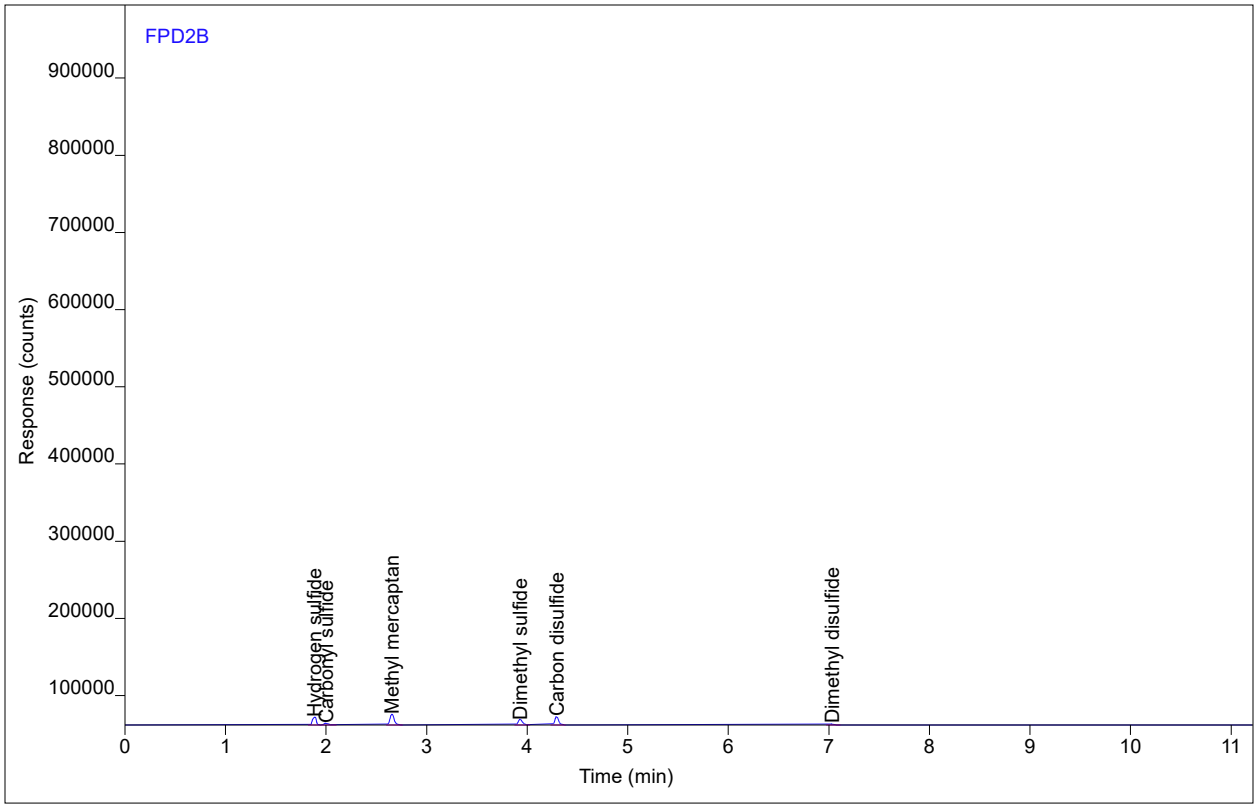
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.89	28682.1	10293.5	1.18811	1	1.18811	ppmv
Carbonyl sulfide	VB	2.01	9453.13	2860.21	0.61057	1	0.61057	ppmv
Methyl mercaptan	BB	2.66	40948.7	13687.0	1.31597	1	1.31597	ppmv
Dimethyl sulfide	BB	3.93	22684.8	7490.34	1.04948	1	1.04948	ppmv
Carbon disulfide	BB	4.29	29984.3	11154.8	0.65826	1	0.65826	ppmv
Dimethyl disulfide	BB	7.03	4350.33	1944.99	0.19720	1	0.19720	ppmv

Chromatogram Report

Enthalpy Analytical

Sample Name	zeppoP0625 #2
Sequence Name	ZEPPOP0625 1 ver.2
Inj Data File	002B2704.D
File Location	GC/2021/Zeppo/Quarter 4
Injection Date	11/18/2021 5:17 AM
File Modified	11/18/2021 10:16 AM
Instrument	Zeppo
Operator	Nicole West

Sample Type	Calibration
Vial Number	Vial 2
Injection Volume	NA
Injection	4 of 4
Acquisition Method	DUALFPD8.M
Analysis Method	ZEPPOP0625_2.M
Method Modified	11/18/2021 10:05 AM
Printed	11/18/2021 10:24 AM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen sulfide	BV	1.88	27553.9	9892.10	1.16543	1	1.16543	ppmv
Carbonyl sulfide	VB	2.00	8467.72	2663.60	0.57918	1	0.57918	ppmv
Methyl mercaptan	BB	2.66	41052.7	13747.1	1.31758	1	1.31758	ppmv
Dimethyl sulfide	BB	3.93	22853.0	7201.94	1.05321	1	1.05321	ppmv
Carbon disulfide	BB	4.29	29563.5	10966.5	0.65372	1	0.65372	ppmv
Dimethyl disulfide	BB	7.03	4731.77	1690.74	0.20530	1	0.20530	ppmv

Calibration Table

Calib. Data Modified : Wednesday, November 17, 2021 1:12:39 PM

Rel. Reference Window : 2.500 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 5.000 %
Abs. Non-ref. Window : 0.100 min
Uncalibrated Peaks : using compound Hydrogen sulfide
Partial Calibration : Yes, identified peaks are recalibrated
Correct All Ret. Times: No, only for identified peaks

Curve Type : Power
Origin : Ignored
Weight : Equal

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Signal 1: FPD2 B,

RetTime [min]	Sig	Lvl	Amount [ppmv]	Area	Amt/Area	Ref	Grp	Name
1.885	1	2	1.18000	2.42257e4	4.87086e-5			Hydrogen sulfide
		3	1.58900	4.67233e4	3.40087e-5			
		4	4.65500	4.27996e5	1.08763e-5			
		5	10.17300	1.93514e6	5.25700e-6			
2.004	1	2	5.85000e-1	7895.56657	7.40922e-5			Carbonyl sulfide
		3	7.88000e-1	1.51644e4	5.19637e-5			
		4	2.30800	1.32833e5	1.73752e-5			
		5	5.04500	5.69368e5	8.86071e-6			
2.655	1	2	1.32800	3.58762e4	3.70162e-5			Methyl mercaptan
		3	1.78800	6.91347e4	2.58626e-5			
		4	5.23800	6.35367e5	8.24406e-6			
		5	11.44700	2.72123e6	4.20656e-6			
3.928	1	2	1.05600	2.05600e4	5.13618e-5			Dimethyl sulfide
		3	1.42100	3.79530e4	3.74411e-5			
		4	4.16500	3.49205e5	1.19271e-5			
		5	9.10300	1.56318e6	5.82340e-6			
4.292	1	2	6.63000e-1	2.65527e4	2.49692e-5			Carbon disulfide
		3	8.92000e-1	4.98106e4	1.79078e-5			
		4	2.61400	4.43077e5	5.89965e-6			
		5	5.71400	1.85951e6	3.07285e-6			
7.032	1	2	2.01000e-1	4091.73625	4.91234e-5			Dimethyl disulfide
		3	2.71000e-1	7571.52116	3.57920e-5			
		4	7.94000e-1	7.16371e4	1.10836e-5			
		5	1.73500	3.12480e5	5.55235e-6			

More compound-specific settings:

Compound: Hydrogen sulfide

Method C:\GC\2021\ZEPPO\METHODS\ZEPPOP0625_1.M

Time Window : From 1.659 min To 2.002 min

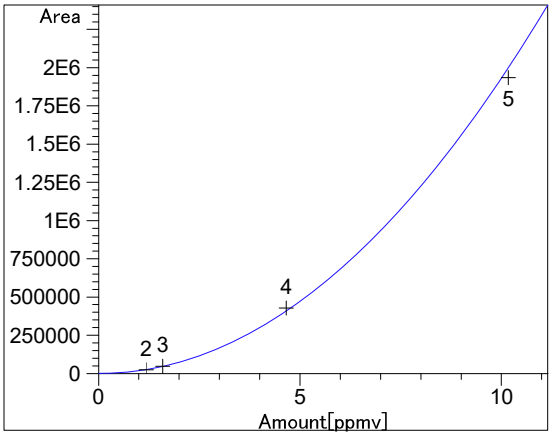
1 Warnings or Errors :

Warning : Overlapping peak time windows at 1.885 min, signal 1

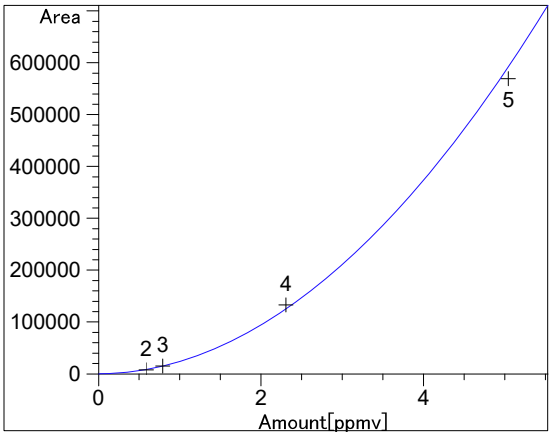
Peak Sum Table

Name	StartTime [min]	EndTime [min]	Use Reference	Response factor	Multiplier	ISTD Peak
Total Redu	2.700	12.000	Hydrogen S	0.0000	1.432e-6	None

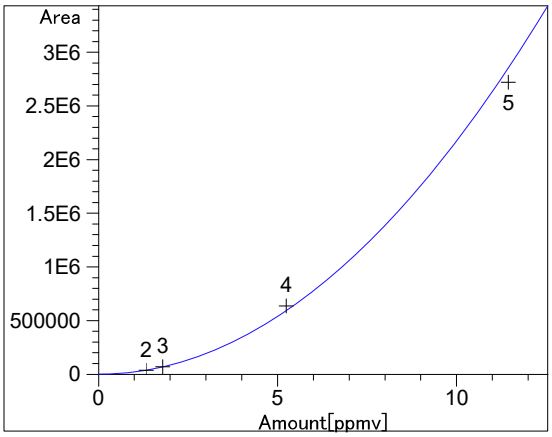
Calibration Curves



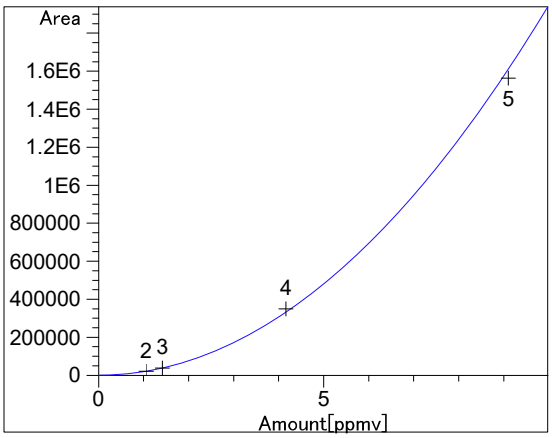
Hydrogen sulfide at exp. RT: 1.885
FPD2 B,
Correlation: 0.99984
Residual Std. Dev.: 48063.62375
Formula: y = b * x^m
m: 2.03334
b: 17888.02554
x: Amount
y: Area



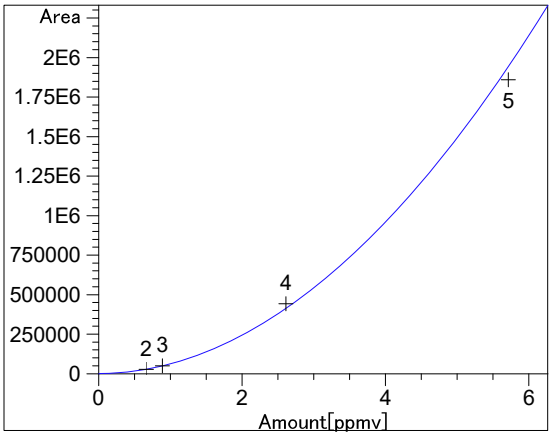
Carbonyl sulfide at exp. RT: 2.004
FPD2 B,
Correlation: 0.99975
Residual Std. Dev.: 17159.47161
Formula: y = b * x^m
m: 1.98578
b: 23819.49050
x: Amount
y: Area



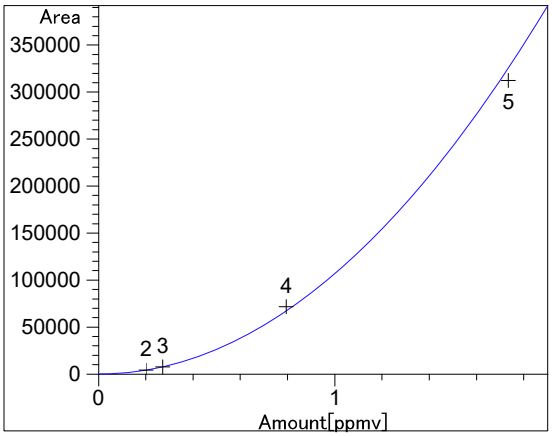
Methyl mercaptan at exp. RT: 2.655
FPD2 B,
Correlation: 0.99963
Residual Std. Dev.: 99113.82467
Formula: y = b * x^m
m: 2.01300
b: 21103.78156
x: Amount
y: Area



Dimethyl sulfide at exp. RT: 3.928
FPD2 B,
Correlation: 0.99985
Residual Std. Dev.: 36045.76703
Formula: y = b * x^m
m: 2.01736
b: 18715.19685
x: Amount
y: Area



Carbon disulfide at exp. RT: 4.292
FPD2 B,
Correlation: 0.99965
Residual Std. Dev.: 63457.22504
Formula: y = b * x^m
m: 1.97816
b: 61862.84441
x: Amount
y: Area



Dimethyl disulfide at exp. RT: 7.032
FPD2 B,
Correlation: 0.99970
Residual Std. Dev.: 9886.33266
Formula: y = b * x^m
m: 2.02224
b: 106874.14454
x: Amount
y: Area

==========

Trace Source™ Permeation Tube Certificate of Calibration

This tube was individually calibrated by gravimetric weight loss analysis at the temperature listed. The tube was held at a constant temperature (+/- 0.05°C traceable to N.I.S.T.), under an inert purge for an extended period of time and its weight loss per unit time recorded. This Certificate of Calibration certifies that the tube listed is traceable to the National Institute of Standards and Technology through an unbroken chain of standards for the duration listed below.

Customer: Enthalpy Analytical

Customer P.O. No: PO-004184

KIN-TEK Order No.: 144579

Calibration Date: 3/19/2021

Certification Expires: 3/22/22

NIST Weight Set: 2001/01067906-1

Other: Per procedure 30260953 Rev1.31

Ship Date: 3-22-2021

Type: EL-SRT-2

Serial No.: 66966

KIN-TEK Part No.: EL-SRT-2 - 001.50 - 1002 /50

Permeating Fluid: Hydrogen sulfide

K_0: 0.657 MW: 34.08

Emission Rate ng / min	Temperature °C
2,719	50

Calibrated by:

Certification Specialist

KIN -TEK

The Calibration Specialists

KIN-TEK Analytical, Inc. 504 Laurel
La Marque, Texas 77568
Phone: (409) 938-3627
Fax: (409) 938-3710

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: T-53469

Certification Date: Dec 11, 2020 Certificate Expires: Dec 11, 2021
Chemical: Carbonyl Sulfide 463-58-1
Part Number: 157-553-7600-VH-C50
Device Type: Dynacal Wafer Geometry: 50T3
Permeation Rate: 2379.30 ng/min Temperature: 50 C
True Accuracy: +/- 0.32 % Max Allowed Accuracy: +/- 5.00 %
Certification Method: Gravimetric Order No: 132187
Customer: ENTHALPY ANALYTICAL

Note: Empty weight 19.97 g. rate warrantied for continuous use 5/15/2021.

Approved By: _____

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. Th

CONSULT SDS FOR ADDITIONAL INFORMATION ON HAZARDS

Carbonyl sulfide
CAS No.: 463-58-1
EC No.: 207-340-0
UN No.: 2204

DANGER
Hazard Statements

Extremely flammable gas. Contains gas under pressure; may explode if heated. Causes skin irritation. Causes serious eye irritation. Toxic if inhaled. May cause respiratory irritation.

Precautionary Statements

Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Avoid breathing dust/fume/gas/mist/vapors/spray. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician. Protect from sunlight. Store in a well-ventilated place.

VICI Metronics
26295 Twelve Trees In Poulsbo, Wa. 98370 USA
(360)697-9199

's are routinely serviced and cali
c permeation rate determinatic
confidence level.

METRONICS® DYNACAL PERMEATION DEVICE

MATERIAL	TYPE	SALES ORDER NUMBER
CARBONYL SULFIDE CAS# 463-58-1	WD-VH	132187

SIZE	PART NUMBER	SERIAL NUMBER
50T3	157-553-7600-VH-C50	F-53469

PERMEATION RATE
Total Rate: 2379.30 ng/min +/- 0.32% @ 50° C

OPEN IN VENTILATED AREA
Review chemical properties of listed material and use with appropriate safety procedures. Refrigeration recommended to prolong useful life. ☐

VICI Metronics Inc.(360) 697- 9199 fax: (360) 697- 6682
26295 Twelve Trees Poulsbo, WA 98370 U.S.A
www. vicimetronics.com

(360)697-9199

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 33-57112

Certification Date: Dec 11, 2020 Certificate Expires: Dec 11, 2021
Chemical: Methyl Mercaptan 74-93-1
Part Number: PD-6000-C50
Device Type: Dynacal Tube Length: 20.00
Permeation Rate: 4319.31 ng/min Temperature: 50 C
True Accuracy: +/- 1.85 % Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric Order No: 132187
Customer: ENTHALPY ANALYTICAL

Note: Empty weight 7.6 g. Rate warrantied for continuous use till 5/6/2020. estimated chemical life.

Approved By: _____

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrat[illegible] metric permeation rate determination is [illegible] 95% confidence level.

CONSULT SDS FOR ADDITIONAL INFORMATION ON HAZARDS

Methyl mercaptan
CAS No.: 74-93-1
EC No.: 200-822-1
UN No.: 1064

DANGER
Hazard Statements

Extremely flammable gas. Contains gas under pressure; may explode if heated. Fatal if inhaled. Very toxic to aquatic life.

Precautionary Statements

Keep away from heat/sparks/open flames/hot surfaces – No smoking. Do not breathe dust/fume/gas/mist/vapours/spray. Use only outdoors or in an well-ventilated area. Avoid release to the environment. Wear respiratory protection. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Collect spillage. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight. Store in a well-ventilated place. Dispose of contents/container to [illegible]

VICI Metronics
26295 Twelve Trees in Poulsbo, Ws, 98370 USA
(360)697-9199

METRONICS® DYNACAL PERMEATION DEVICE

MATERIAL	TYPE	SALES ORDER NUMBER
METHYL MERCAPTAN CAS# 74-93-1	STD-33	132187
MAX SIZE: 23.5 cm / PART NUMBER: PD-6000-C50		SERIAL NUMBER: 33-57112
PERMEATION RATE: Total Rate: 4319.31 ng/min +/- 1.85% @ 50° C		

OPEN IN VENTILATED AREA
Review chemical properties of listed material and use with appropriate safety procedures. Refrigeration recommended to prolong useful life. ☐

VICI Metronics Inc.(360) 697- 9199 fax: (360) 697- 6682
26295 Twelve Trees Poulsbo, WA 98370 U.S.A

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 89-57114

Certification Date: Dec 11, 2020 Certificate Expires: Dec 11, 2021
Chemical: Dimethyl Sulfide 75-18-3
Part Number: PD-6200-C50
Device Type: Dynacal Tube Length: 10.50
Permeation Rate: 4579.51 ng/min Temperature: 50 C
True Accuracy: +/- 0.43 % Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric Order No: 132187
Customer: ENTHALPY ANALYTICAL
Note: Empty weight 12.3 g.

Approved By: K. Miles

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. The

CONSULT SDS FOR ADDITIONAL INFORMATION ON HAZARDS

Methyl sulfide
CAS No. 75-18-3
EC No. 200-846-2
UN No. 1164

DANGER

Hazard Statements

highly flammable liquid and vapor | harmful to aquatic life

Precautionary Statements

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If eye irritation persists: Get medical advice/attention. Store in a well-ventilated place. Keep cool. Store locked up. Dispose of contents/container to an approved waste disposal plant.

VICI Metronics Inc. 26295 Twelve Trees Poulsbo, WA 98370 U.S.A.
360-697-9199

are routinely serviced and c
permeation rate determina
confidence level.

METRONICS® DYNACAL PERMEATION DEVICE

MATERIAL	TYPE	SALES ORDER NUMBER
DIMETHYL SULFIDE CAS# 75-18-3	HE-89	132187
MAX SIZE: 23.5 cm	PART NUMBER: PD-6200-C50	SERIAL NUMBER: 89-57114
PERMEATION RATE: Total Rate: 4579.51 ng/min +/- 0.43% @ 50° C		

OPEN IN VENTILATED AREA
Review chemical properties of listed material and use with appropriate safety procedures. Refrigeration recommended to prolong useful life. ☐

VICI Metronics Inc.(360) 697- 9199 fax: (360) 697- 6682
26295 Twelve Trees Poulsbo, WA 98370 U.S.A
www. vicimetronics.com

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 33-57115

Certification Date: Dec 11, 2020 Certificate Expires: Dec 11, 2021
Chemical: Carbon Disulfide CAS# 75-15-0
Part Number: PD-6300-C50
Device Type: Dynacal Tube Length: 2.50
Permeation Rate: 3413.63 ng/min Temperature: 50 C
True Accuracy: +/- 1.32 % Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric Order No: 132187
Customer: ENTHALPY ANALYTICAL
Note: Empty weight 10.5 g.

Approved By: _____

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology.

CONSULT SDS FOR ADDITIONAL INFORMATION ON HAZARDS

Carbon disulfide

CAS No : 75-15-0
EC No : 200-843-6
UN No : 1131

DANGER

Hazard Statements

Precautionary Statements

360-697-9199

are routinely serviced and calibrated
permeation rate determination is cor
confidence level.

METRONICS® DYNACAL PERMEATION DEVICE

MATERIAL	TYPE	SALES ORDER NUMBER
CARBON DISULFIDE CAS# 75-15-0	STD-33	132187

MAX SIZE	PART NUMBER	SERIAL NUMBER
23.5 cm	PD-6300-C50	33-57115

PERMEATION RATE
Total Rate: 3413.63 ng/min +/- 1.32% @ 50° C

OPEN IN VENTILATED AREA
Review chemical properties of listed material and use with appropriate safety procedures. Refrigeration recommended to prolong useful life.

VICI Metronics Inc.(360) 697- 9199 fax: (360) 697- 6682
26295 Twelve Trees Poulsbo, WA 98370 U.S.A
www. vicimetronics.com

CERTIFICATE

The permeation rate of the DYNACAL® PERMEATION DEVICE listed below is certified traceable to N.I.S.T. standards.

Chemical Fill	:	Dimethyl Disulfide
Device Type	:	High Emission Tube
Length/Geometry	:	15.0 cm.
Part Number	:	107-150-6301-C50
Method of Certification	:	Gravimetric
Certification Number	:	89-83331

Rate: 639 ng/min +/- 2% at 50 deg C
Note:
Date: 09 December 1998 by: Jo Ann Banks

VICI

VICI Metronics, Inc.
2991 Corvin Drive
Santa Clara, California 95051 U.S.A.
(408) 737-0550 Telefax: 408-737-0346

CERTIFICATE

The permeation rate of the DYNACAL® PERMEATION DEVICE listed below is certified traceable to N.I.S.T. standards.

Chemical Fill	:	Dimethyl Disulfide
Device Type	:	High Emission Tube
Length/Geometry	:	15.0 cm.
Part Number	:	107-150-6301-C50
Method of Certification	:	Gravimetric
Certification Number	:	89-83330

Rate: 643 ng/min +/- 2% at 50 deg C
Note:
Date: 09 December 1998 by: Jo Ann Banks

VICI

VICI Metronics, Inc.
2991 Corvin Drive
Santa Clara, California 95051 U.S.A.
(408) 737-0550 Telefax: 408-737-0346

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X02NI99C15AC3D4	Reference Number:	122-401549589-1
Cylinder Number:	CC425720	Cylinder Volume:	144.3 Cubic Feet
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jul 22, 2019	Valve Outlet:	330
Lot Number:	122-401549589-1		

Expiration Date: Jul 22, 2022

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
HYDROGEN SULFIDE	7.000 PPM	7.020 PPM	+/- 5%
NITROGEN	Balance		

Permanent Notes:MONTROSE ENV ENTHALPY ANALY

Approved for Release

Method C:\GC\2021\ZEPPO\METHODS\ZEPPOP0625_2.M

Calibration Table

Calib. Data Modified : Thursday, November 18, 2021 10:05:16 AM

Rel. Reference Window : 2.500 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 5.000 %
Abs. Non-ref. Window : 0.100 min
Uncalibrated Peaks : using compound Hydrogen sulfide
Partial Calibration : Yes, identified peaks are recalibrated
Correct All Ret. Times: No, only for identified peaks

Curve Type : Power
Origin : Ignored
Weight : Equal

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Signal 1: FPD2 B,

RetTime [min]	Sig	Lvl	Amount [ppmv]	Area	Amt/Area	Ref Grp	Name
1.885	1	2	1.18000	2.83238e4	4.16611e-5		Hydrogen sulfide
		3	1.58900	5.21804e4	3.04520e-5		
		4	4.65500	4.98906e5	9.33042e-6		
		5	10.17300	2.49409e6	4.07883e-6		
2.005	1	2	5.85000e-1	8905.24544	6.56916e-5		Carbonyl sulfide
		3	7.88000e-1	1.55238e4	5.07608e-5		
		4	2.30800	1.52104e5	1.51738e-5		
		5	5.04500	7.75597e5	6.50467e-6		
2.656	1	2	1.32800	4.14249e4	3.20580e-5		Methyl mercaptan
		3	1.78800	7.65445e4	2.33590e-5		
		4	5.23800	7.56658e5	6.92255e-6		
		5	11.44700	3.56113e6	3.21443e-6		
3.932	1	2	1.05600	2.31877e4	4.55413e-5		Dimethyl sulfide
		3	1.42100	4.19245e4	3.38942e-5		
		4	4.16500	4.08330e5	1.02001e-5		
		5	9.10300	2.03186e6	4.48012e-6		
4.293	1	2	6.63000e-1	3.02679e4	2.19044e-5		Carbon disulfide
		3	8.92000e-1	5.53207e4	1.61242e-5		
		4	2.61400	5.18615e5	5.04035e-6		
		5	5.71400	2.42665e6	2.35469e-6		
7.033	1	2	2.01000e-1	4584.21126	4.38461e-5		Dimethyl disulfide
		3	2.71000e-1	8425.09049	3.21658e-5		
		4	7.94000e-1	7.72755e4	1.02749e-5		
		5	1.73500	4.14040e5	4.19041e-6		

More compound-specific settings:

Compound: Hydrogen sulfide

Time Window : From 1.659 min To 2.002 min

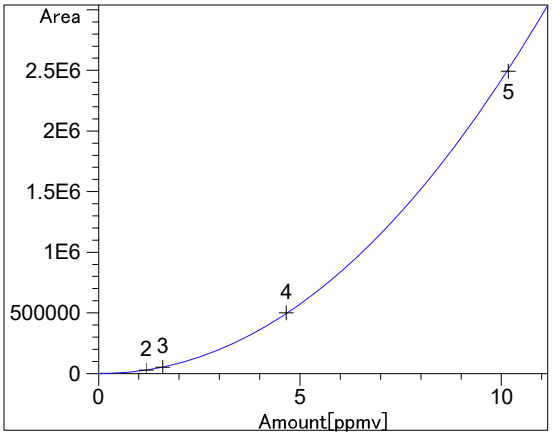
1 Warnings or Errors :

Warning : Overlapping peak time windows at 1.885 min, signal 1

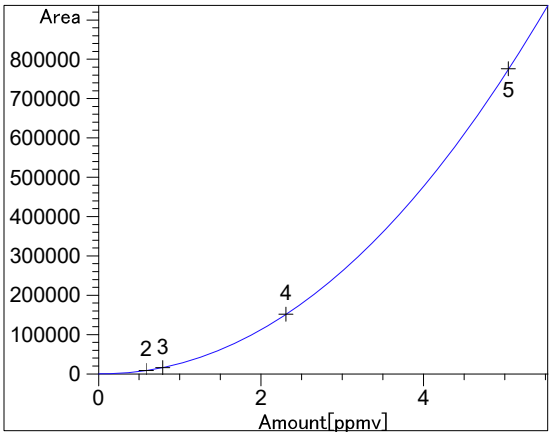
Peak Sum Table

Name	StartTime [min]	EndTime [min]	Use Reference	Response factor	Multiplier	ISTD Peak
Total Redu	2.700	12.000	Hydrogen S	0.0000	1.432e-6	None

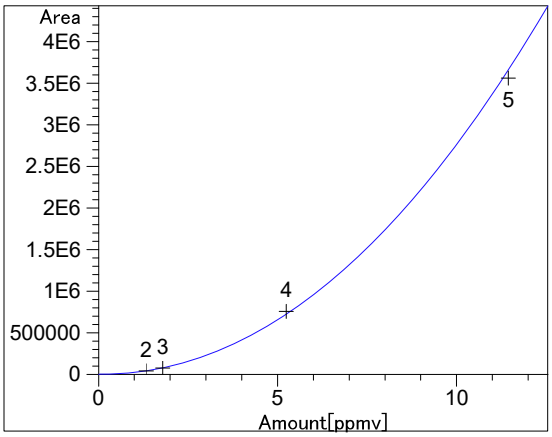
Calibration Curves



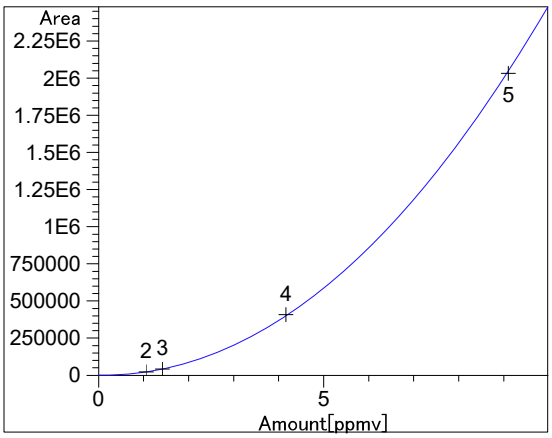
Hydrogen sulfide at exp. RT: 1.885
FPD2 B,
Correlation: 0.99999
Residual Std. Dev.: 12711.61448
Formula: y = b * x^m
m: 2.08262
b: 20031.59129
x: Amount
y: Area



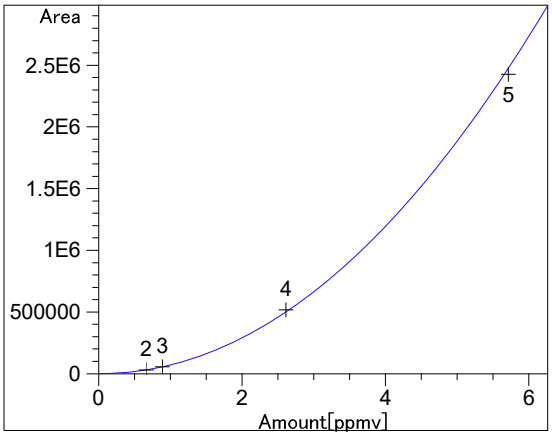
Carbonyl sulfide at exp. RT: 2.005
FPD2 B,
Correlation: 1.00000
Residual Std. Dev.: 1364.87983
Formula: y = b * x^m
m: 2.08598
b: 26456.29261
x: Amount
y: Area



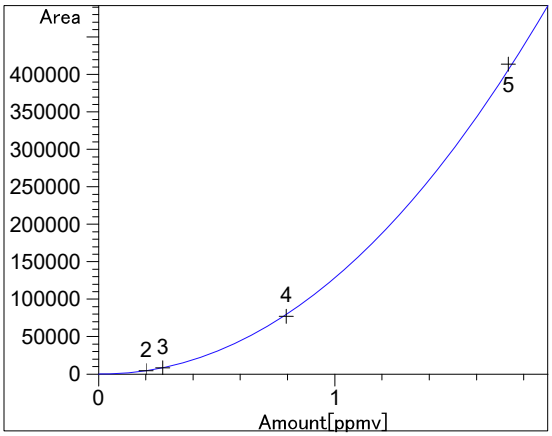
Methyl mercaptan at exp. RT: 2.656
FPD2 B,
Correlation: 0.99987
Residual Std. Dev.: 76367.06201
Formula: y = b * x^m
m: 2.07745
b: 23147.85074
x: Amount
y: Area



Dimethyl sulfide at exp. RT: 3.932
FPD2 B,
Correlation: 0.99999
Residual Std. Dev.: 13009.90804
Formula: y = b * x^m
m: 2.08460
b: 20512.10384
x: Amount
y: Area



Carbon disulfide at exp. RT: 4.293
FPD2 B,
Correlation: 0.99993
Residual Std. Dev.: 37418.58043
Formula: y = b * x^m
m: 2.04251
b: 70439.16463
x: Amount
y: Area



Dimethyl disulfide at exp. RT: 7.033
FPD2 B,
Correlation: 0.99996
Residual Std. Dev.: 5676.07083
Formula: y = b * x^m
m: 2.08637
b: 128713.28463
x: Amount
y: Area

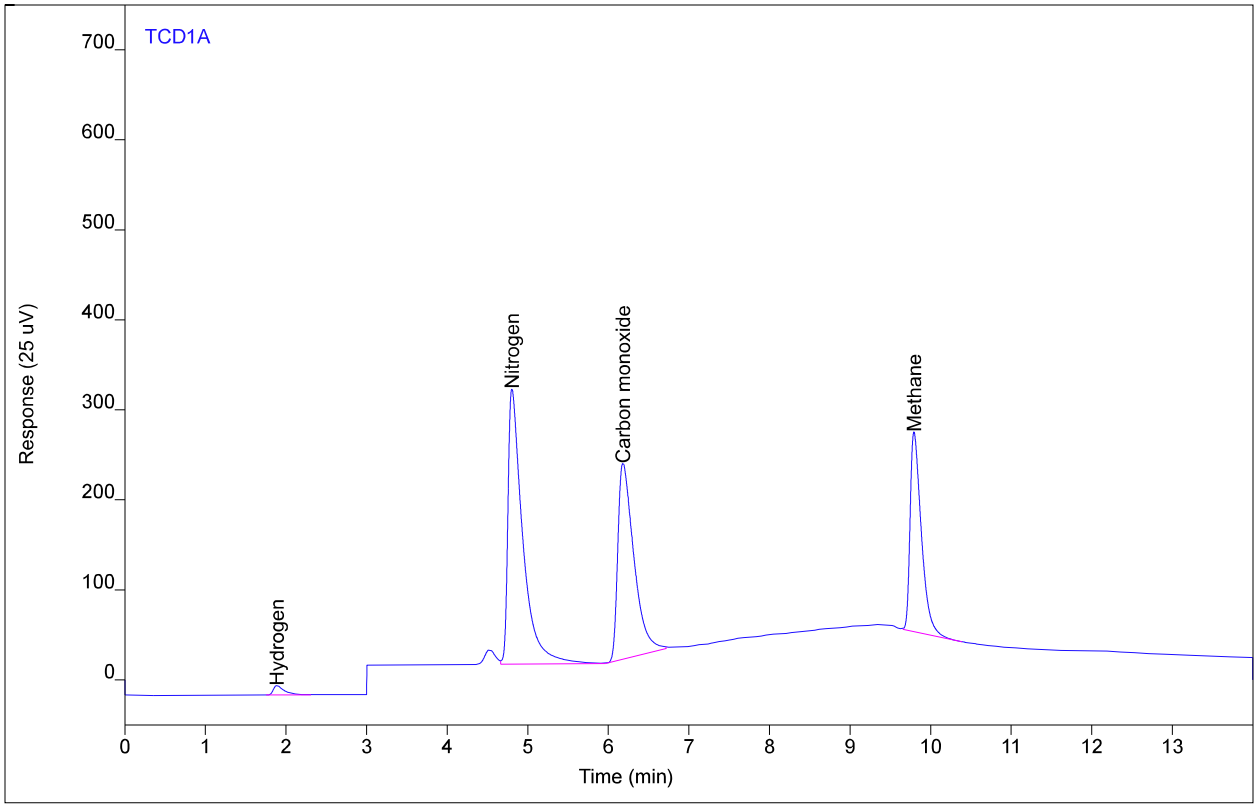
==========

Raw Data

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3101.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	1 of 3
Injection Date	11/19/2021 1:09 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:12 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

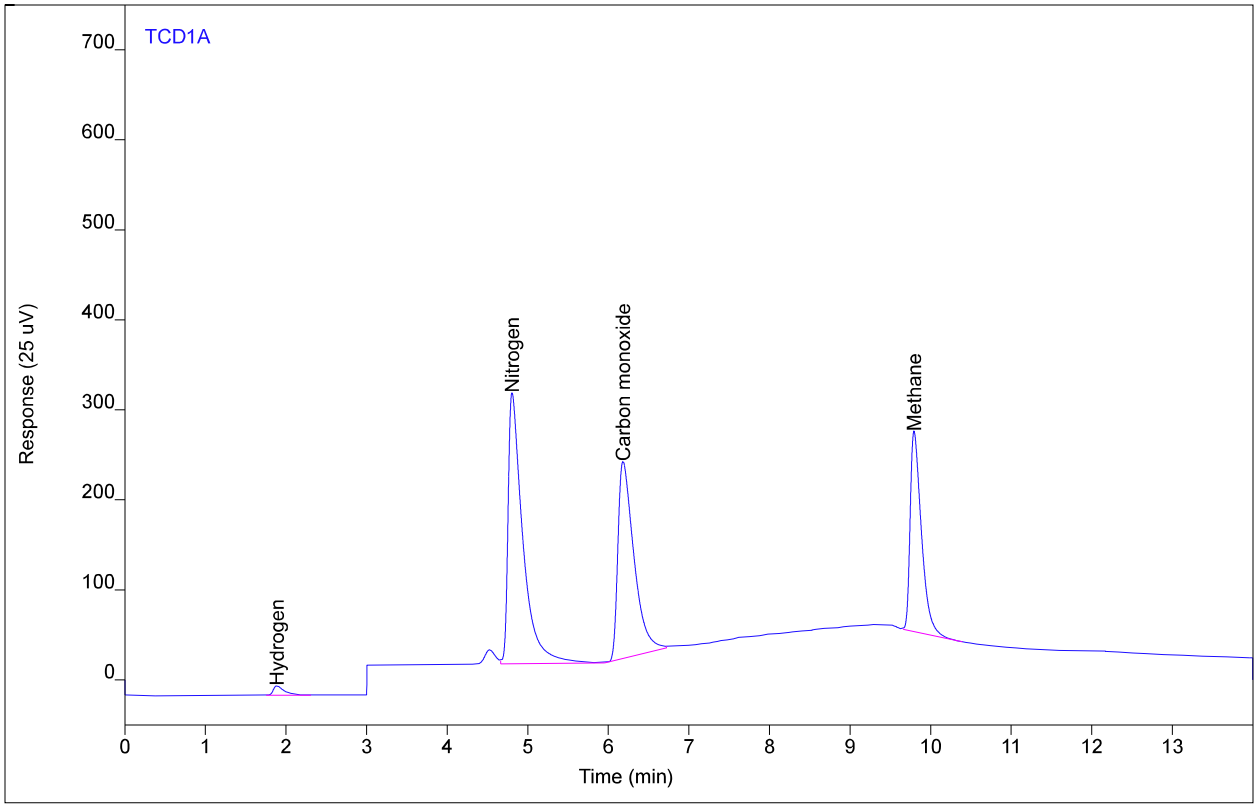


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	101.370	10.4692	8.11286	1	8.11286	%
Nitrogen	VV	4.80	3908.69	306.070	10.5826	1	10.5826	%
Carbon monoxide	VB	6.18	3014.31	217.553	9.32981	1	9.32981	%
Methane	BB	9.80	2150.88	222.103	7.58124	1	7.58124	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3102.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	2 of 3
Injection Date	11/19/2021 1:34 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:12 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

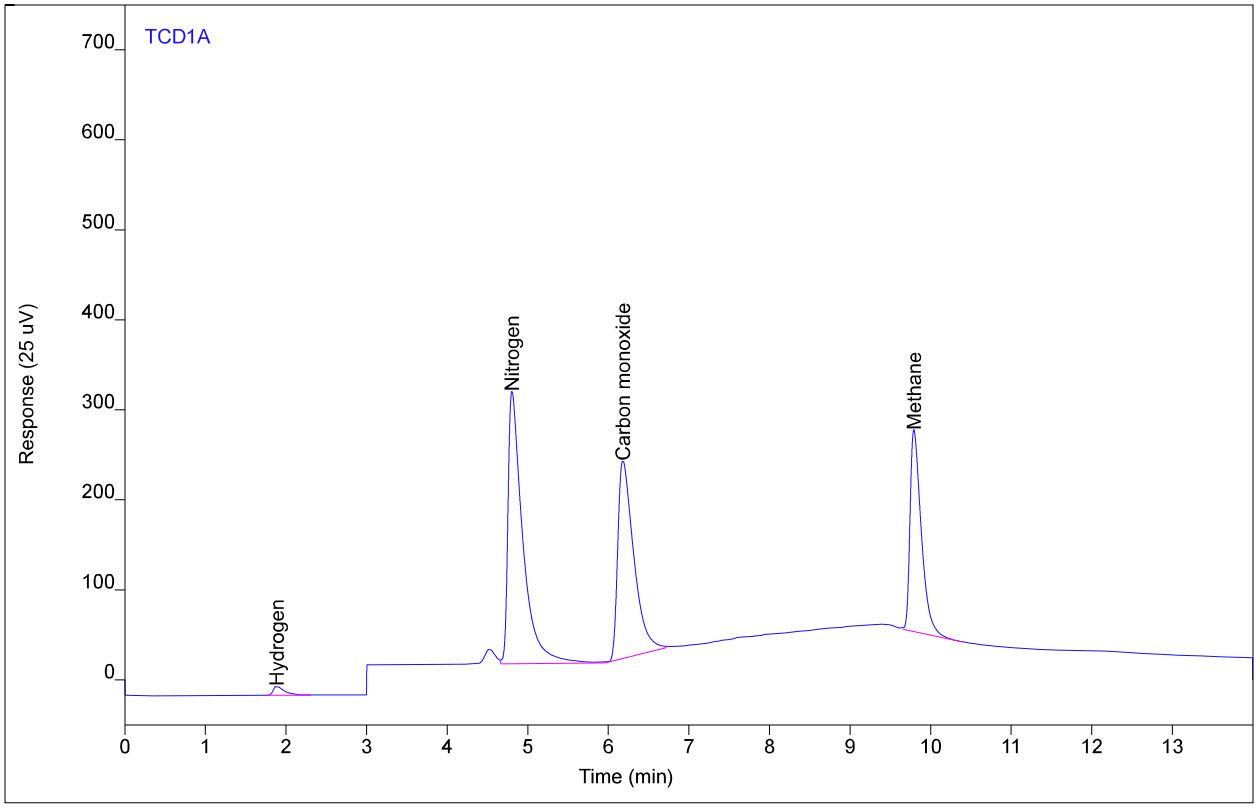


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	101.854	10.5540	8.15190	1	8.15190	%
Nitrogen	VV	4.81	3840.32	301.329	10.3814	1	10.3814	%
Carbon monoxide	VB	6.18	3025.01	219.079	9.36282	1	9.36282	%
Methane	BB	9.79	2160.30	222.513	7.61439	1	7.61439	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3103.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	3 of 3
Injection Date	11/19/2021 1:59 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:12 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

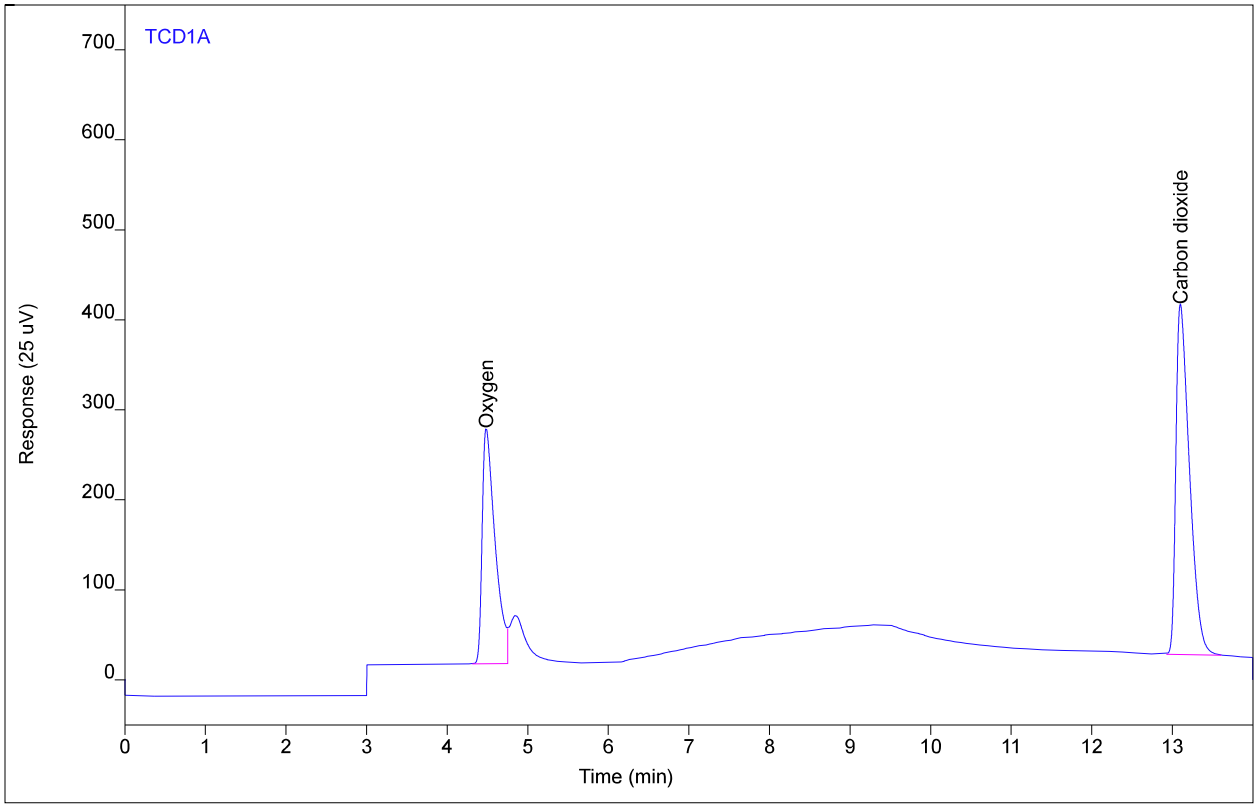


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	102.698	10.5729	8.21994	1	8.21994	%
Nitrogen	VV	4.80	3864.94	303.082	10.4538	1	10.4538	%
Carbon monoxide	VB	6.18	3034.35	219.746	9.39165	1	9.39165	%
Methane	BB	9.79	2175.48	224.132	7.66776	1	7.66776	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1537 #FG4 ENV(1=0,2=358.99)	Sample Type	Calibration
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3201.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	1 of 3
Injection Date	11/19/2021 2:24 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:13 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

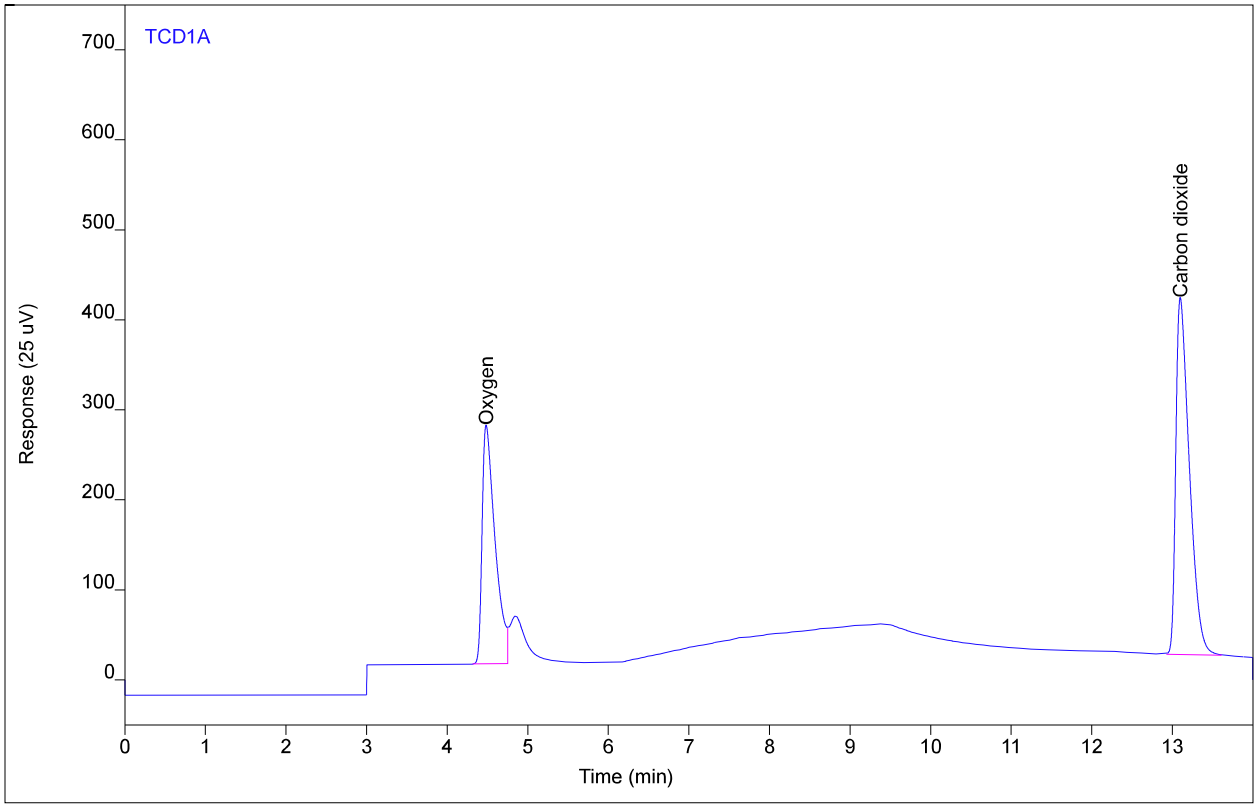


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BV	4.48	2926.26	261.734	9.64400	1	9.64400	%
Carbon dioxide	BB	13.10	4563.32	389.069	9.62697	1	9.62697	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1537 #FG4 ENV(1=0,2=358.99)	Sample Type	Calibration
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3202.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	2 of 3
Injection Date	11/19/2021 2:49 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:13 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

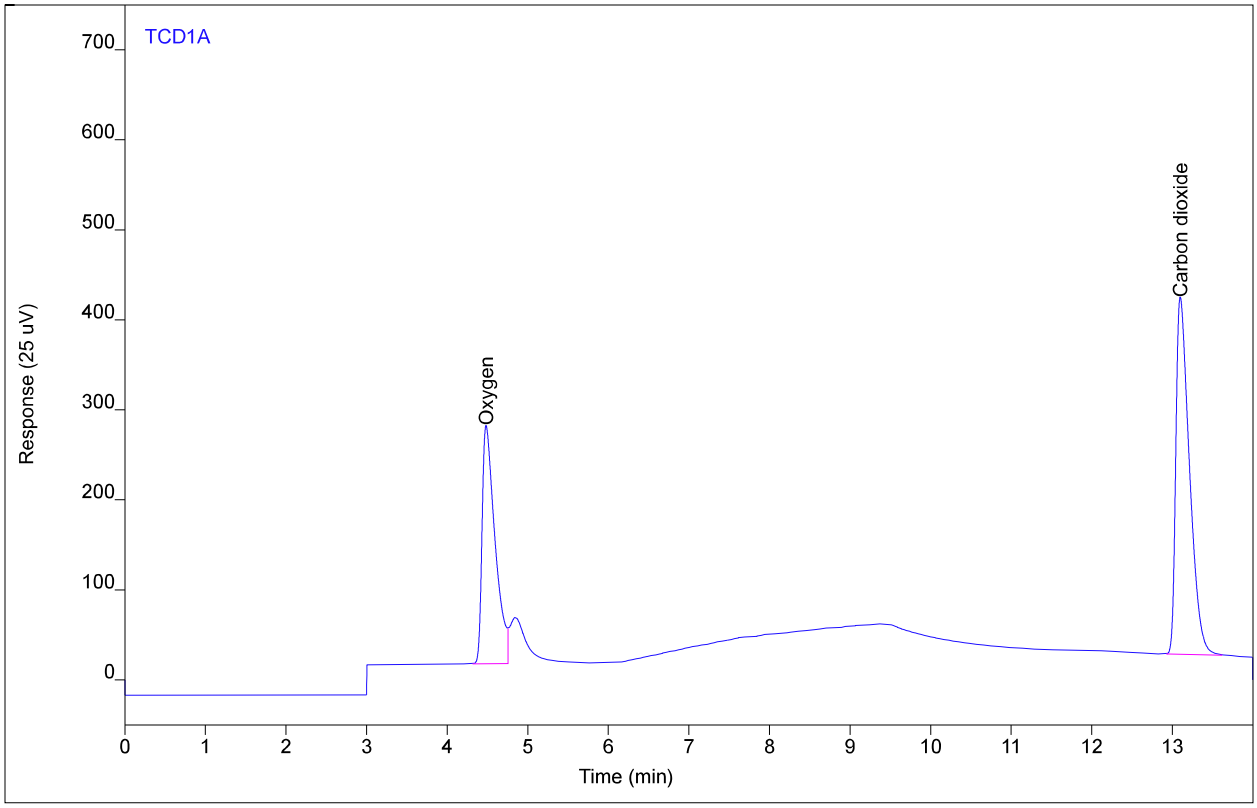


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BV	4.48	2972.83	265.167	9.80074	1	9.80074	%
Carbon dioxide	BB	13.10	4635.12	396.579	9.77847	1	9.77847	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1537 #FG4 ENV(1=0,2=358.99)	Sample Type	Calibration
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3203.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	3 of 3
Injection Date	11/19/2021 3:14 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:13 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

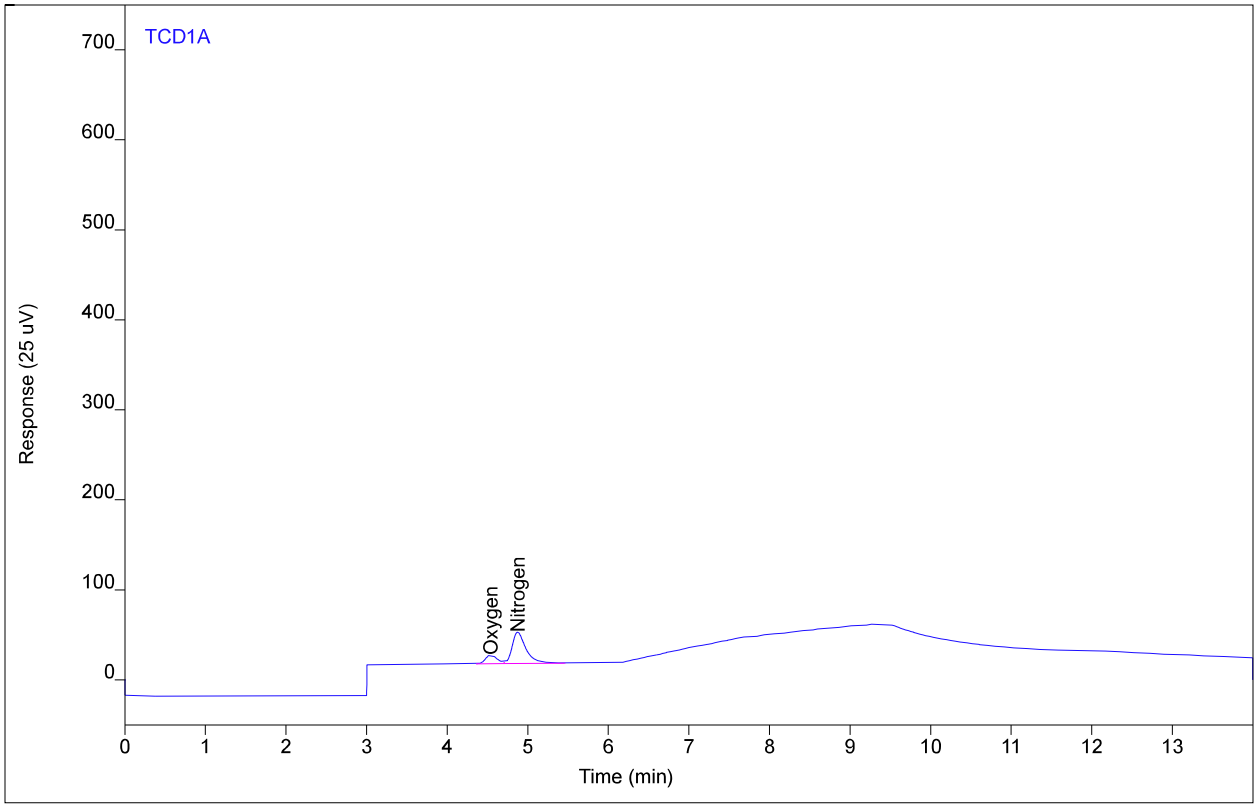


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BV	4.48	2971.17	264.793	9.79516	1	9.79516	%
Carbon dioxide	BB	13.10	4654.56	396.976	9.81949	1	9.81949	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1117 #MB ENV(1=510,2=0)	Sample Type	Sample
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3301.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	1 of 3
Injection Date	11/19/2021 3:40 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:13 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

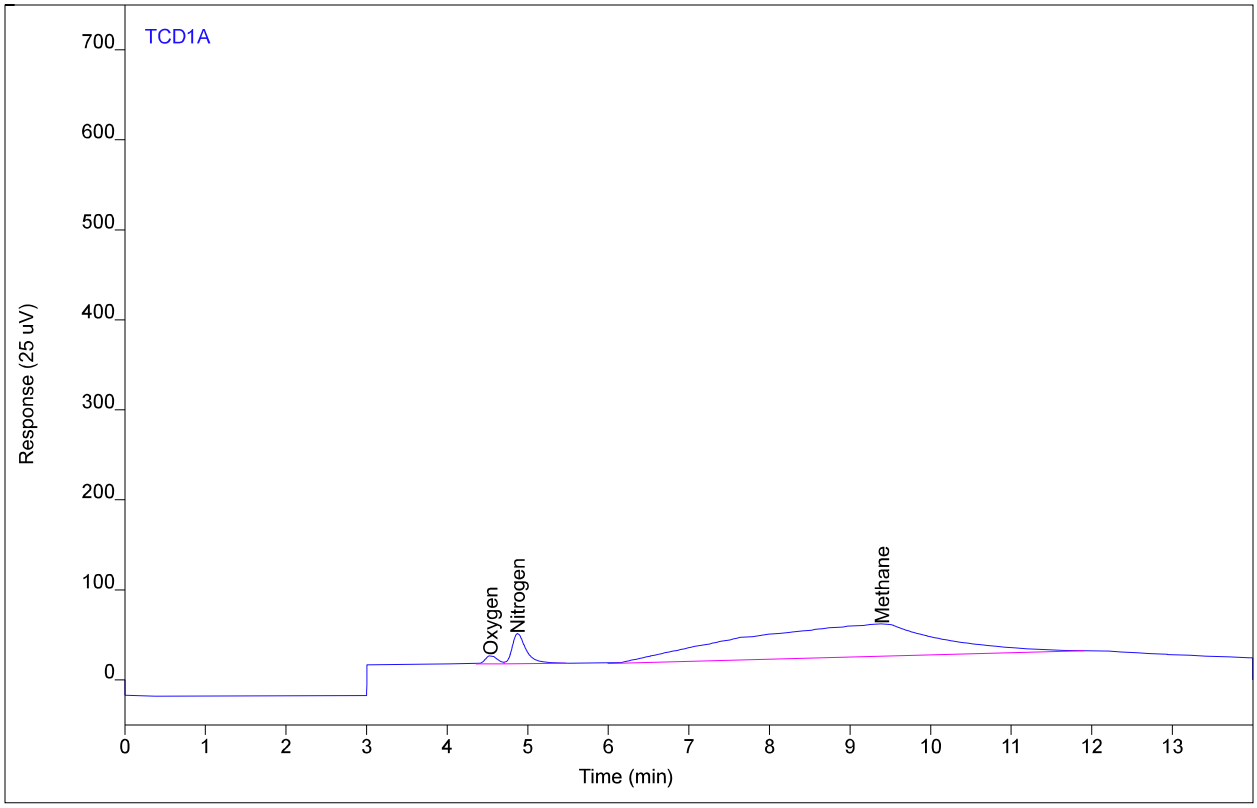


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.54	97.8169	9.83598	0.24921	1	0.24921	%
Nitrogen	VB	4.87	421.224	34.9723	0.41134	1	0.41134	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1117 #MB ENV(1=510,2=0)	Sample Type	Sample
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3302.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	2 of 3
Injection Date	11/19/2021 4:05 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:13 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM

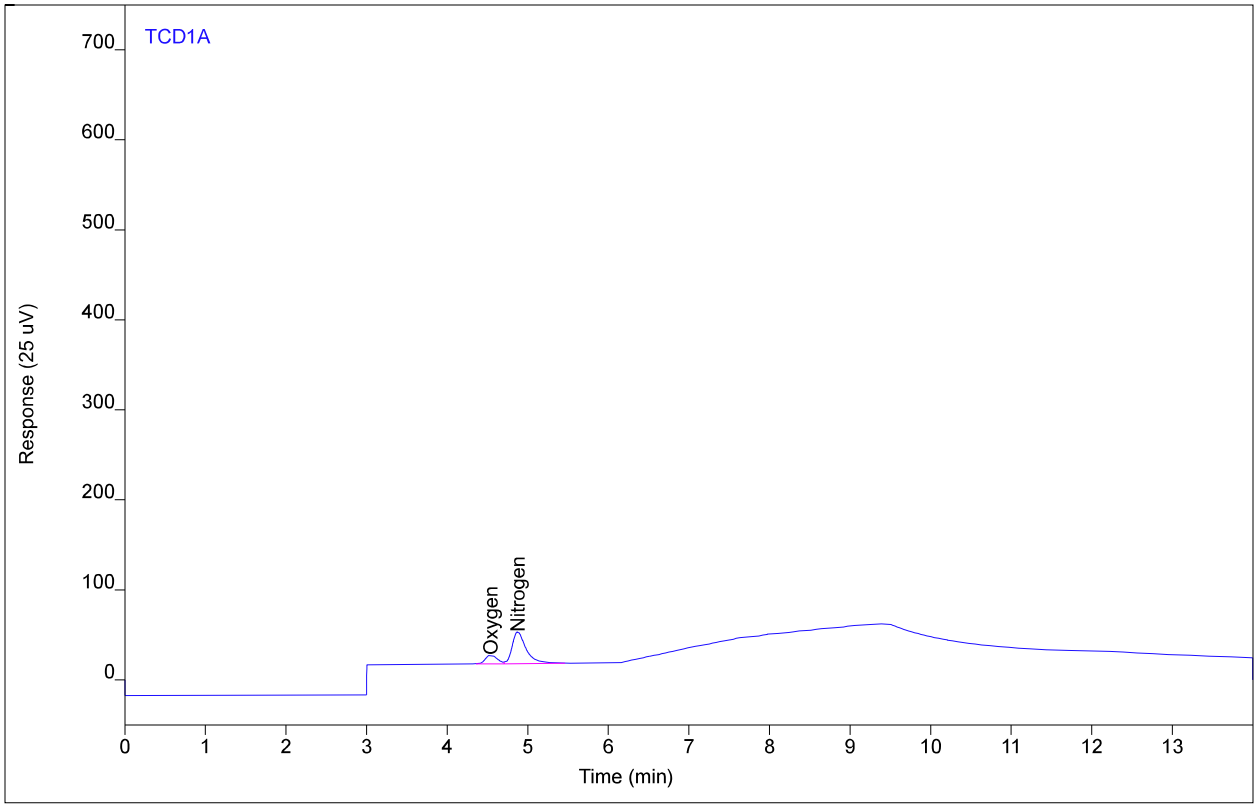


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.54	93.3820	9.38171	0.23791	1	0.23791	%
Nitrogen	VB	4.88	405.352	33.5485	0.39584	1	0.39584	%
Carbon monoxide		(6.21)				1		
Methane	BBA	9.40	6329.34	36.1348	22.2802	1	22.2802	%
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1117 #MB ENV(1=510,2=0)	Sample Type	Sample
Sequence Name	BETTYP1612 ver.1	Vial Number	Vial 9
Inj Data File	009F3303.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	3 of 3
Injection Date	11/19/2021 4:30 AM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:13 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Rhiannon Buchman	Printed	11/22/2021 1:39 PM



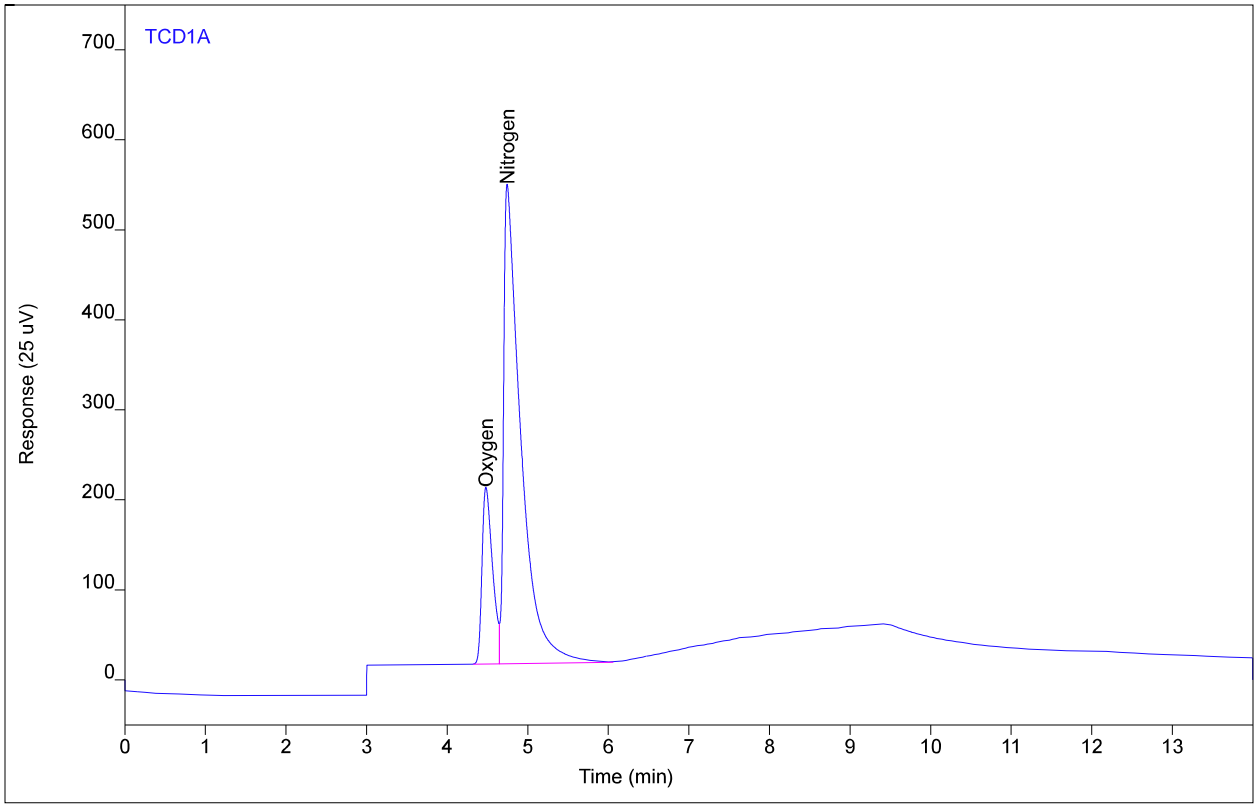
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.54	98.5751	9.89464	0.25114	1	0.25114	%
Nitrogen	VB	4.87	426.756	35.4287	0.41674	1	0.41674	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Compost (0799).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	004F0101.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 9:07 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 4
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



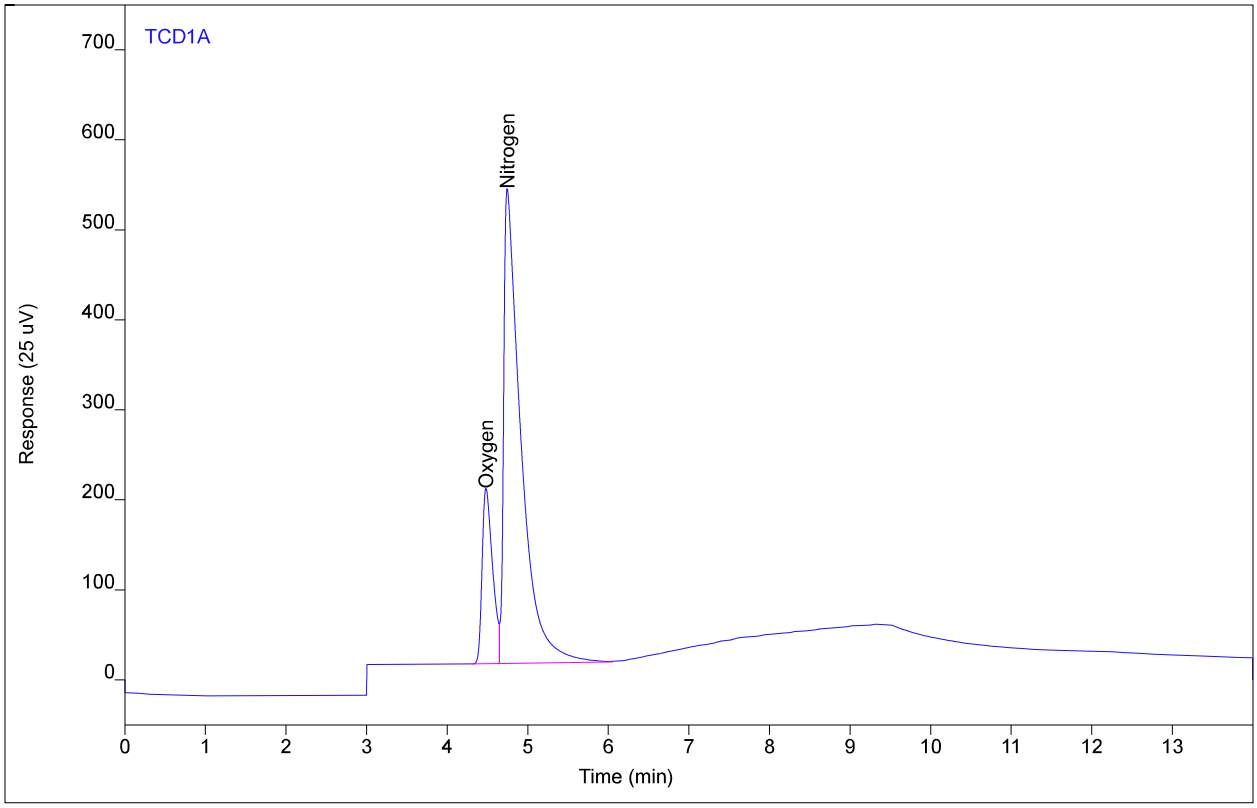
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.48	1773.90	196.395	5.76539	1	5.76539	%
Nitrogen	VV	4.74	7914.37	532.601	22.3732	1	22.3732	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Compost (0799).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	004F0102.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 9:29 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 4
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



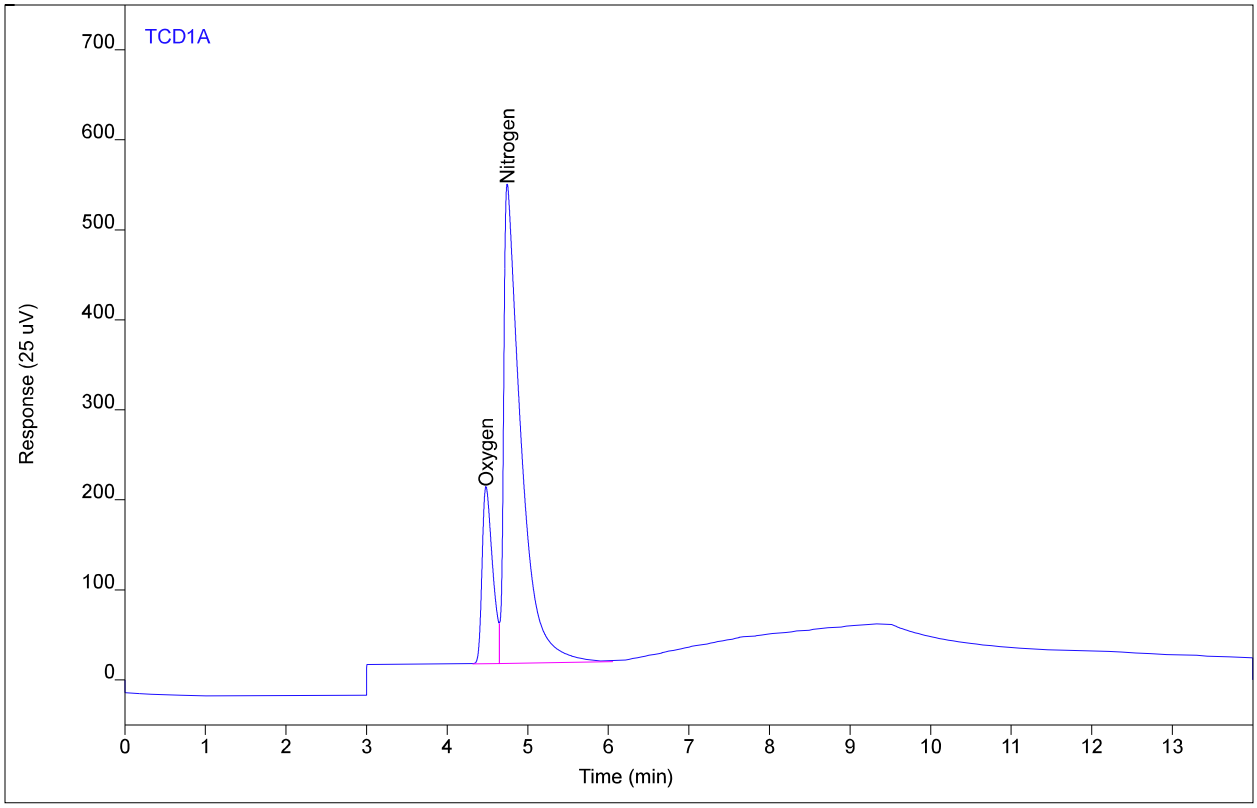
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.48	1760.29	194.814	5.71959	1	5.71959	%
Nitrogen	VV	4.75	7853.64	527.753	22.1945	1	22.1945	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Compost (0799).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	004F0103.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 9:51 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 4
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



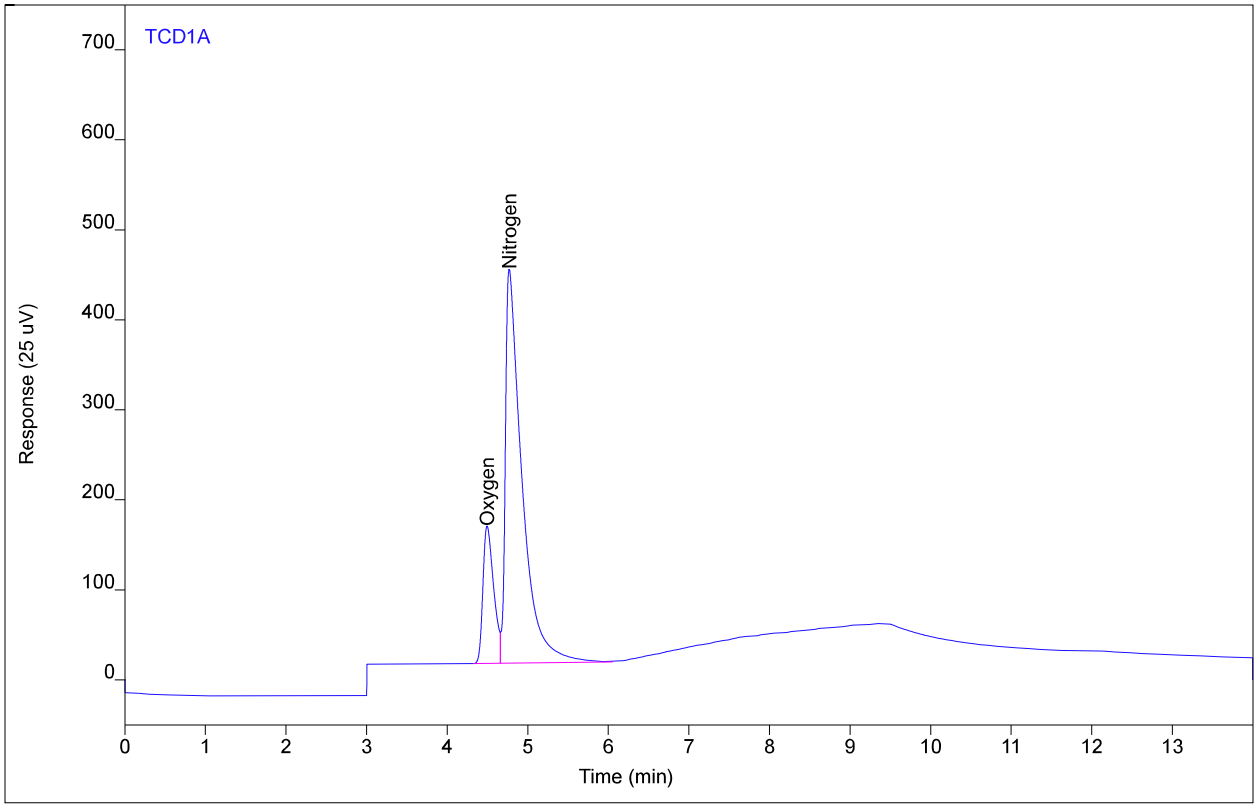
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.48	1776.82	196.619	5.77521	1	5.77521	%
Nitrogen	VV	4.75	7935.50	532.387	22.4354	1	22.4354	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Hot Wells (1734).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	005F0201.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 10:13 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



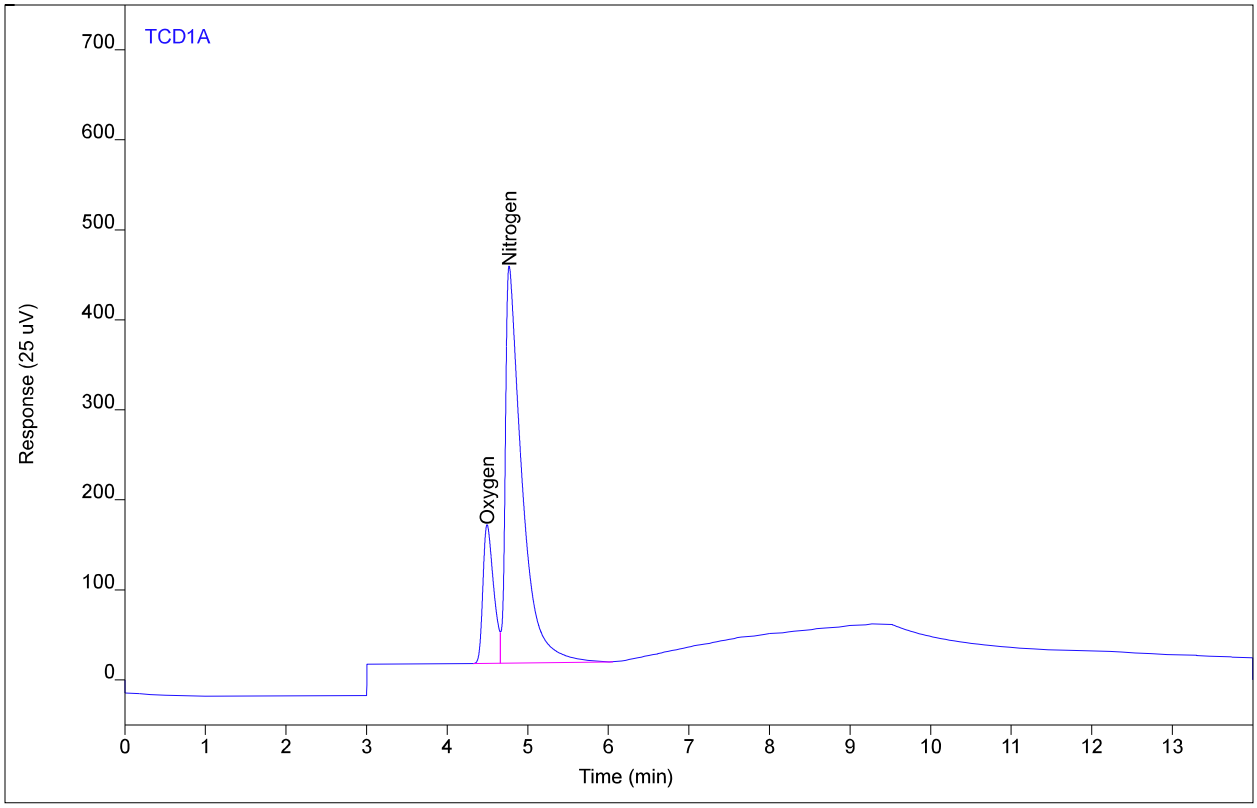
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.50	1415.32	152.744	4.55847	1	4.55847	%
Nitrogen	VV	4.77	6267.70	438.265	17.5263	1	17.5263	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Hot Wells (1734).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	005F0202.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 10:36 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



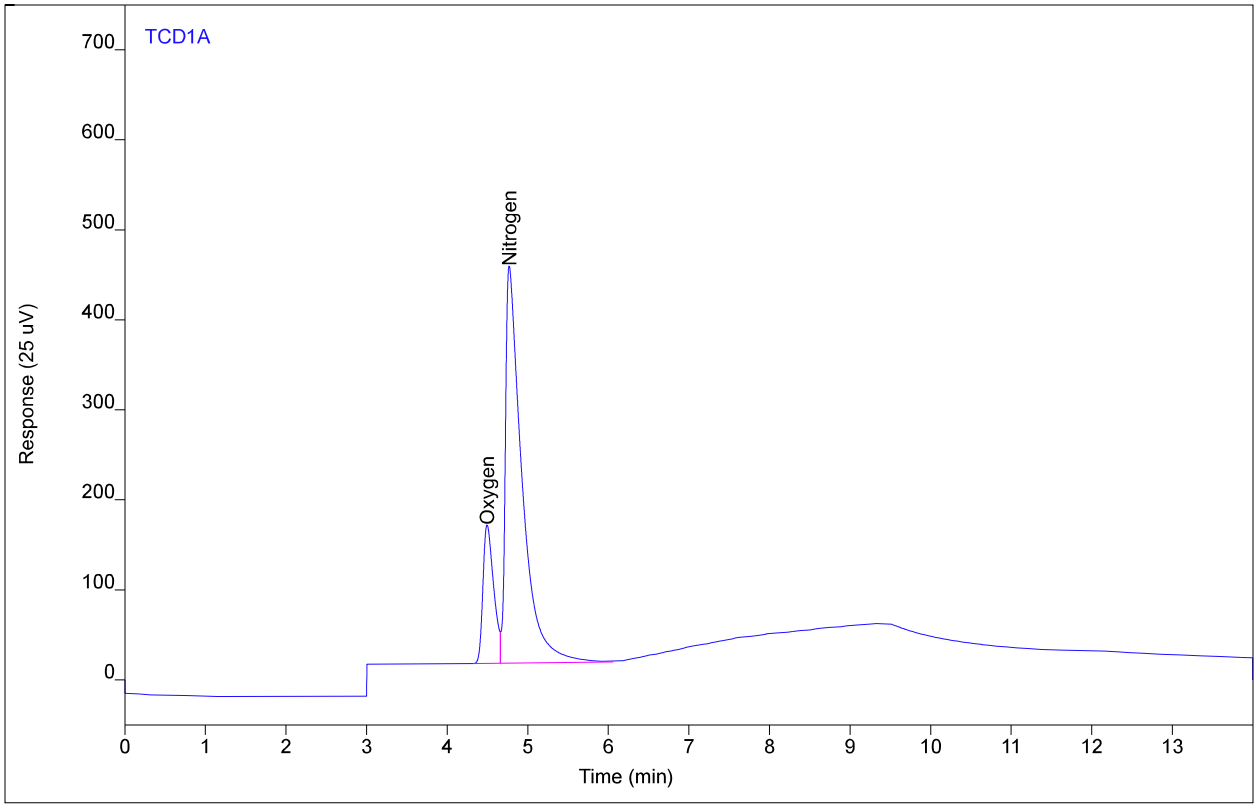
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.50	1427.08	154.055	4.59808	1	4.59808	%
Nitrogen	VV	4.77	6316.60	441.294	17.6702	1	17.6702	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Hot Wells (1734).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	005F0203.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 10:58 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 5
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



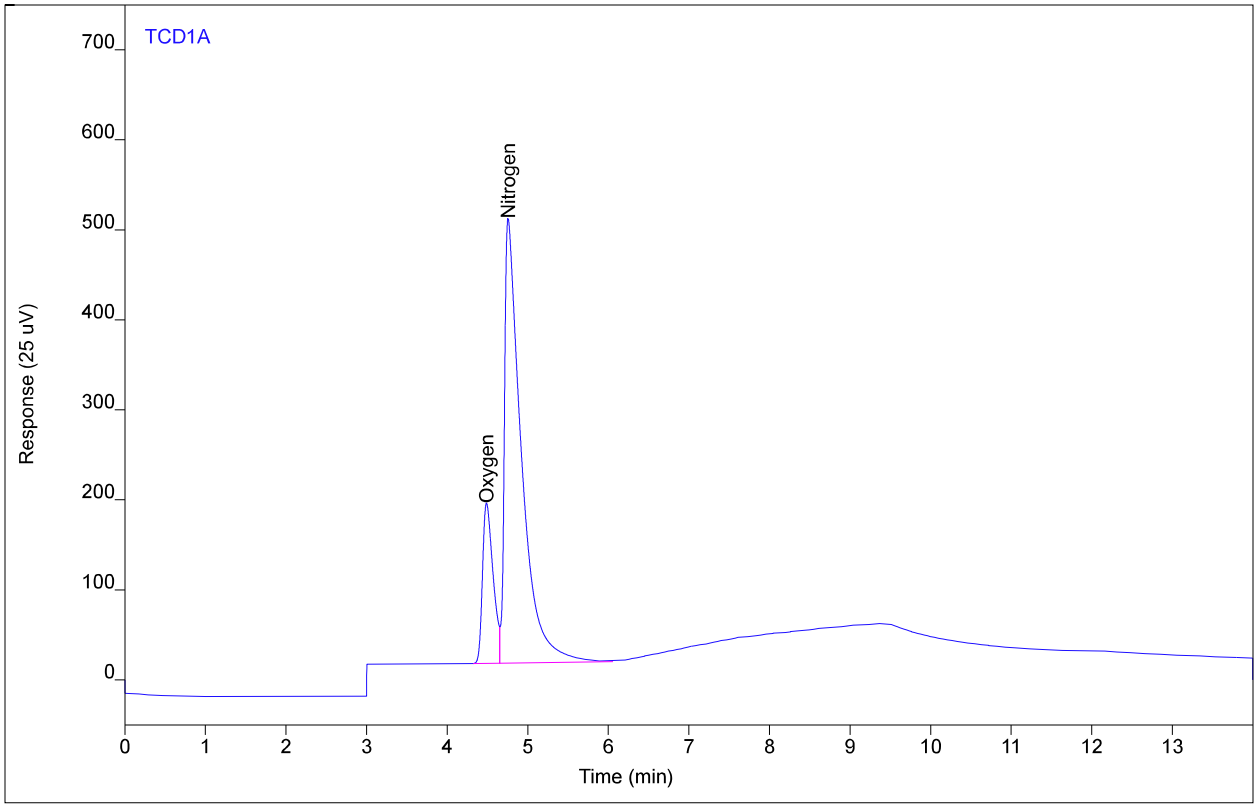
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.50	1425.62	153.910	4.59315	1	4.59315	%
Nitrogen	VV	4.77	6320.83	441.685	17.6827	1	17.6827	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Exiting (0763).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	007F0301.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 11:21 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 7
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



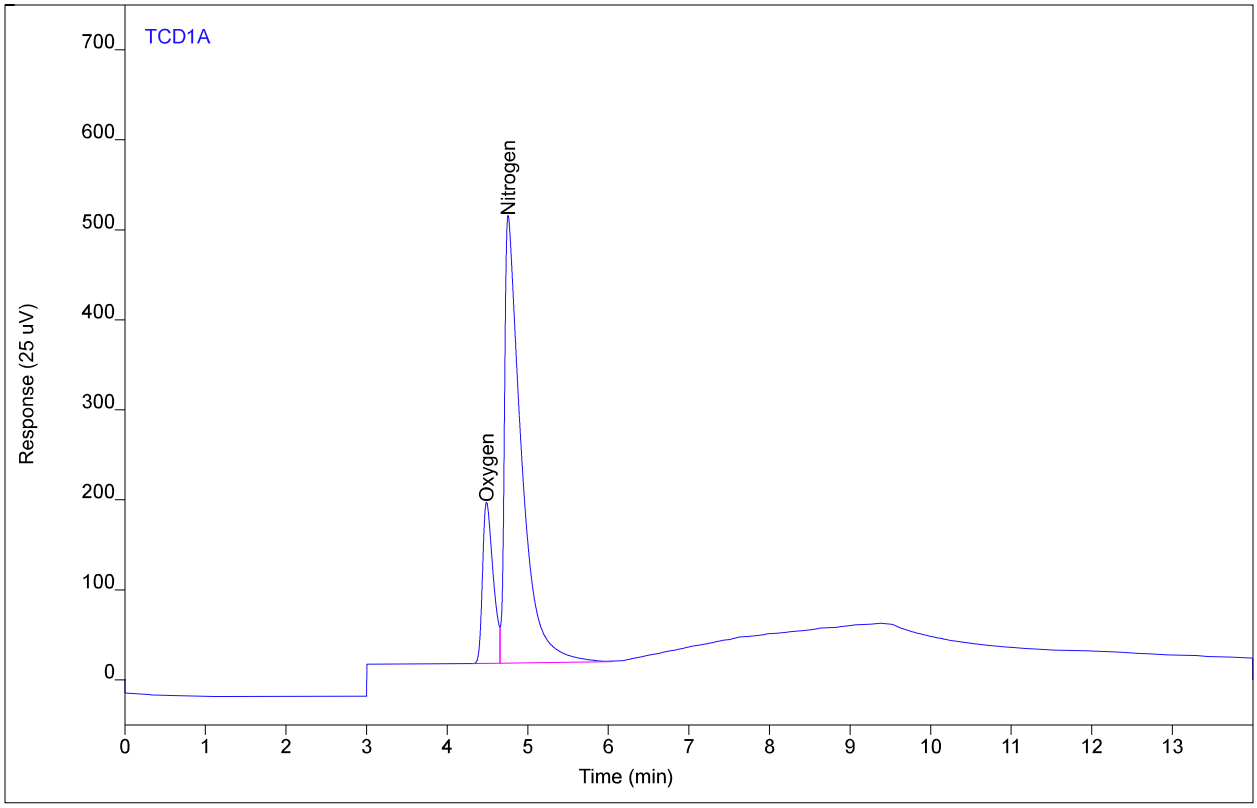
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.49	1625.07	177.950	5.26446	1	5.26446	%
Nitrogen	VV	4.76	7237.14	494.065	20.3798	1	20.3798	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Exiting (0763).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	007F0302.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 11:43 AM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 7
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



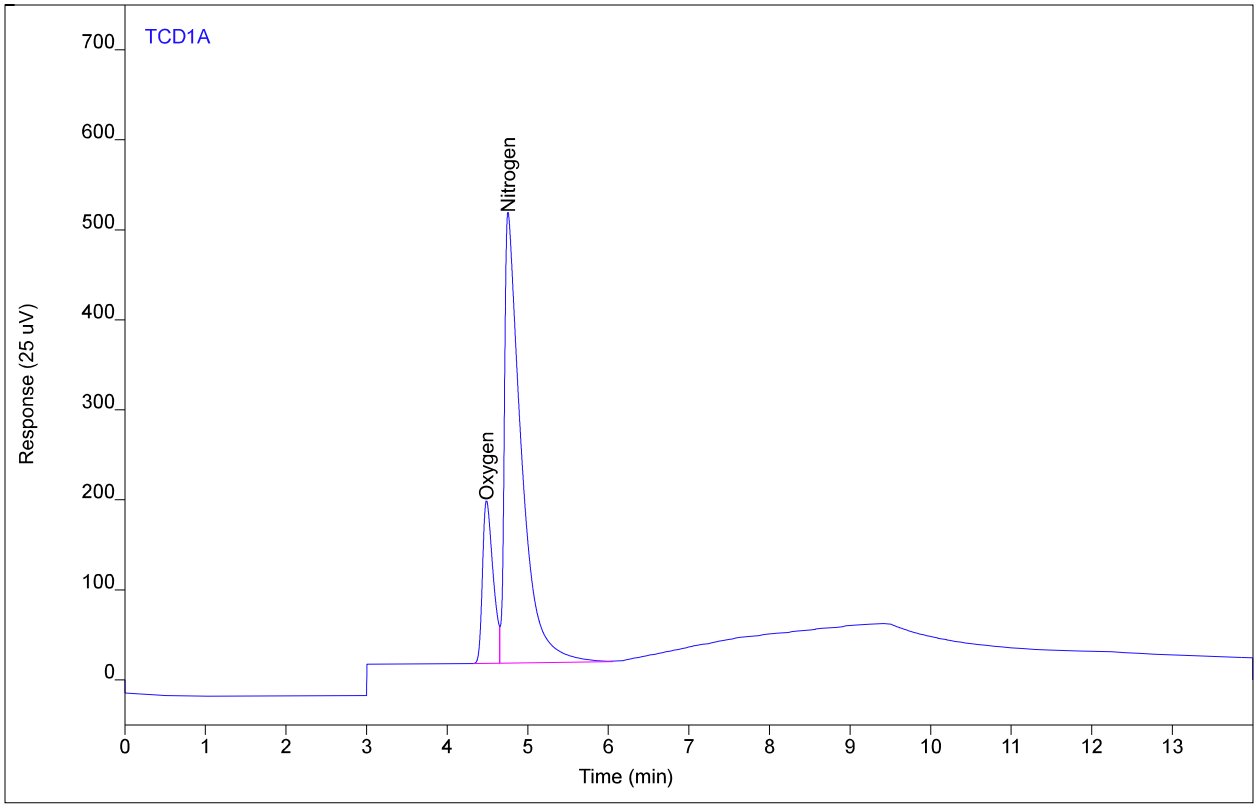
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.49	1636.30	179.219	5.30225	1	5.30225	%
Nitrogen	VV	4.76	7282.89	497.463	20.5145	1	20.5145	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Exiting (0763).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	007F0303.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 12:05 PM
File Modified	11/22/2021 11:19 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 7
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM

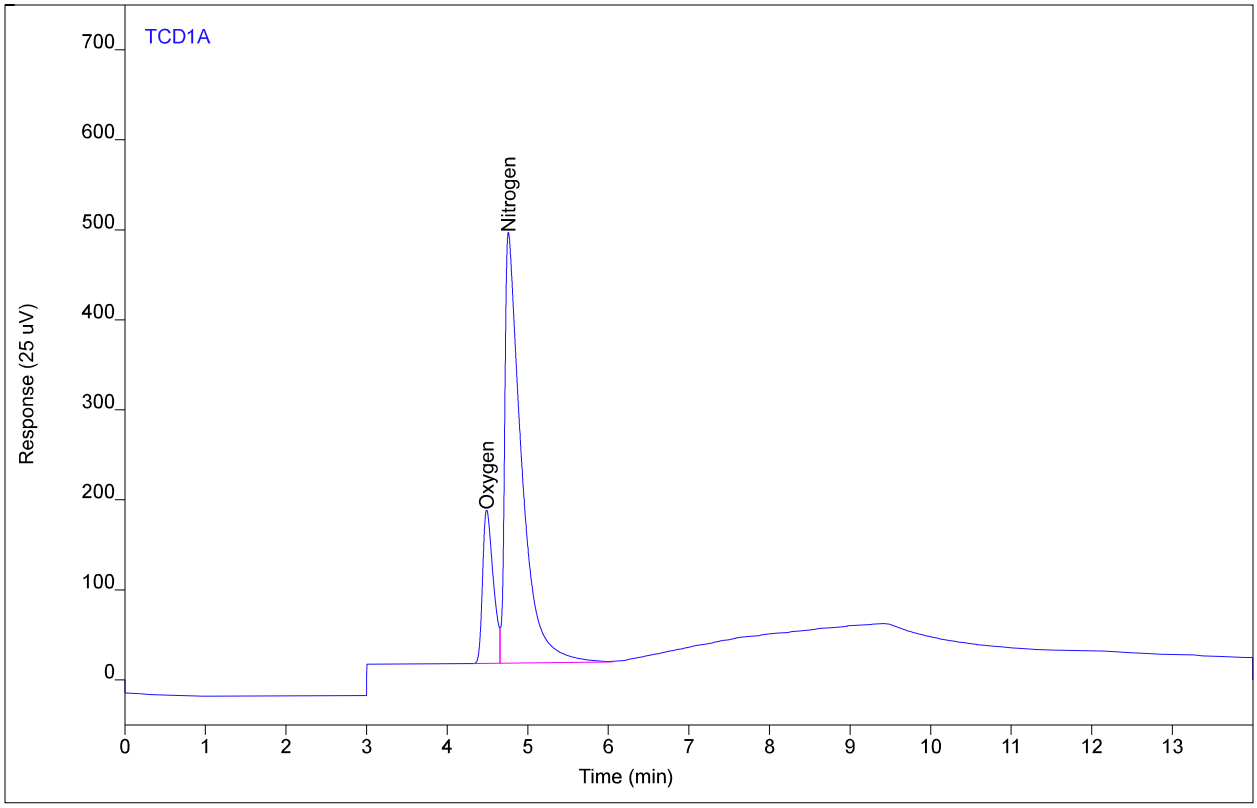


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.49	1651.47	181.093	5.35330	1	5.35330	%
Nitrogen	VV	4.76	7353.71	500.768	20.7230	1	20.7230	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Leachate (R5091).Can	Sample Type	Sample
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 8
Inj Data File	008F0401.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	1 of 3
Injection Date	11/19/2021 12:27 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:19 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM

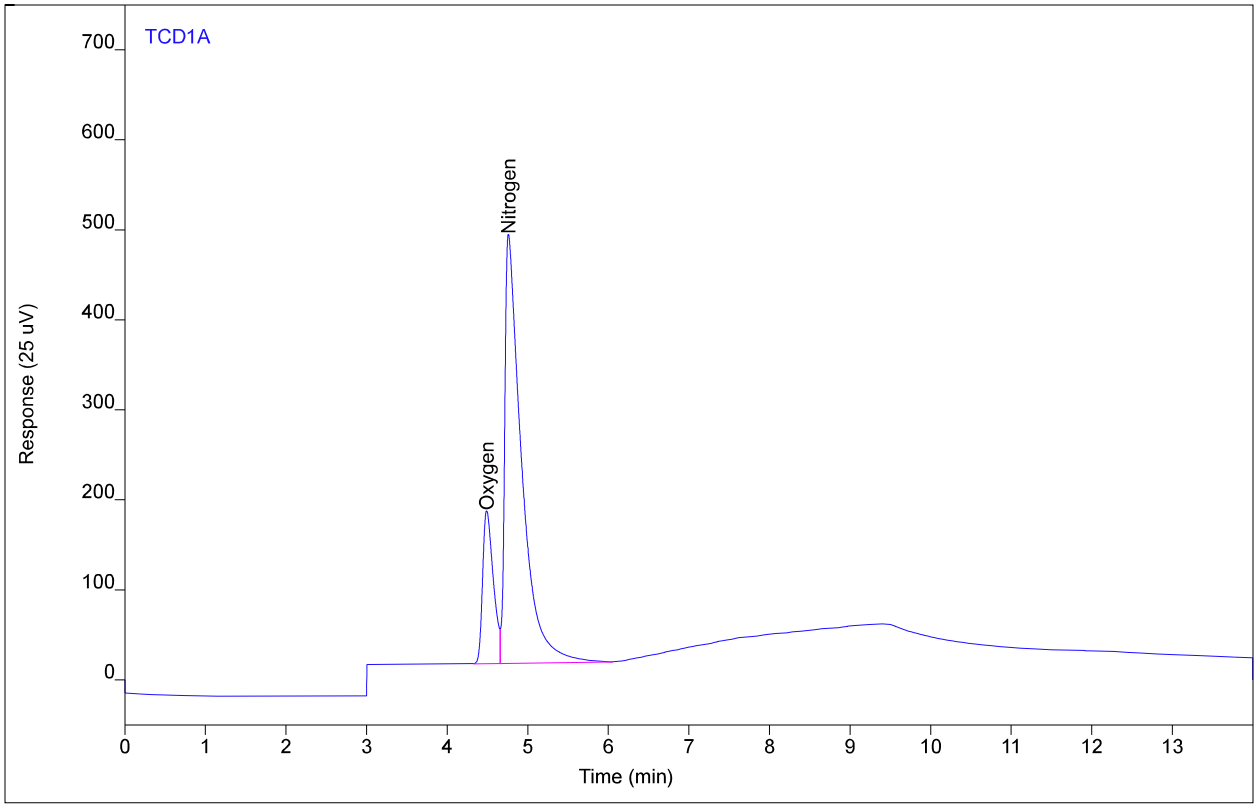


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.49	1566.92	170.981	5.06875	1	5.06875	%
Nitrogen	VV	4.76	6962.80	478.562	19.5723	1	19.5723	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Leachate (R5091).Can	Sample Type	Sample
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 8
Inj Data File	008F0402.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	2 of 3
Injection Date	11/19/2021 12:50 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:19 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM

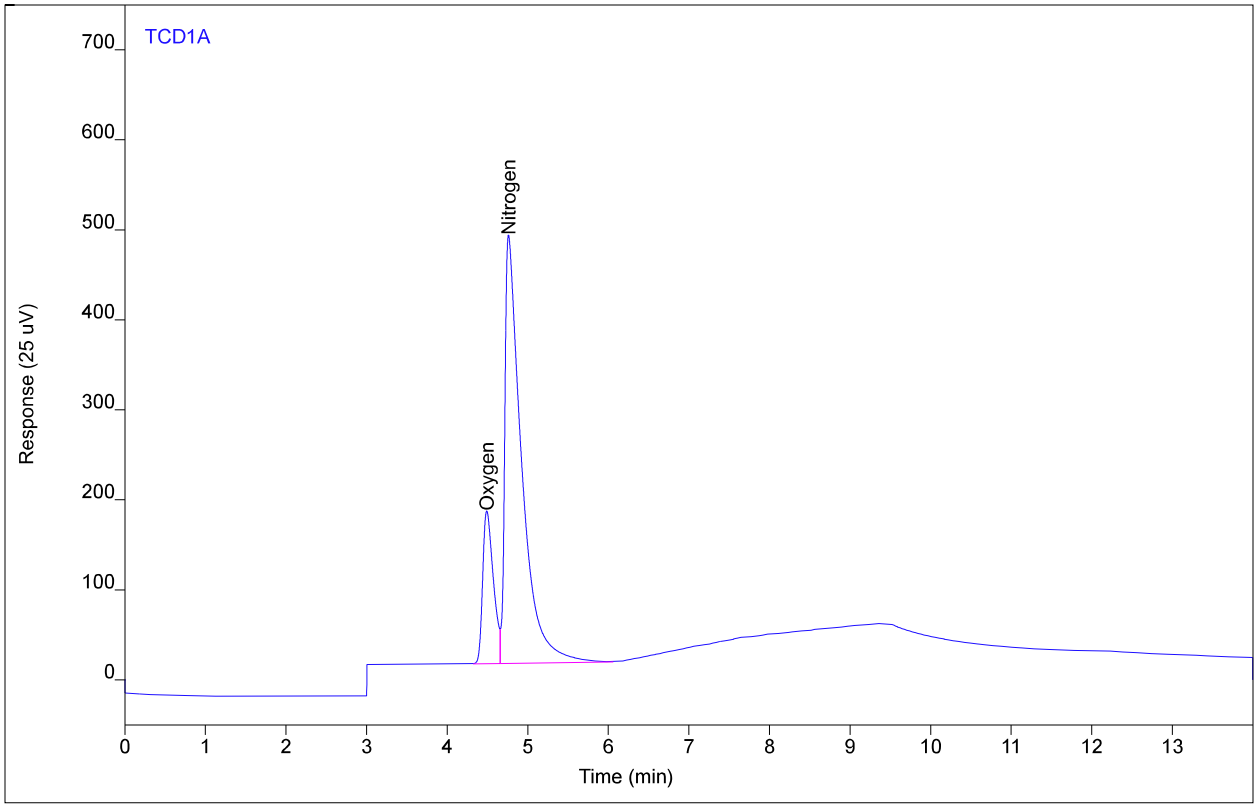


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.49	1561.48	170.334	5.05041	1	5.05041	%
Nitrogen	VV	4.76	6931.98	476.980	19.4816	1	19.4816	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Leachate (R5091).Can	Sample Type	Sample
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 8
Inj Data File	008F0403.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	3 of 3
Injection Date	11/19/2021 1:12 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:20 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM



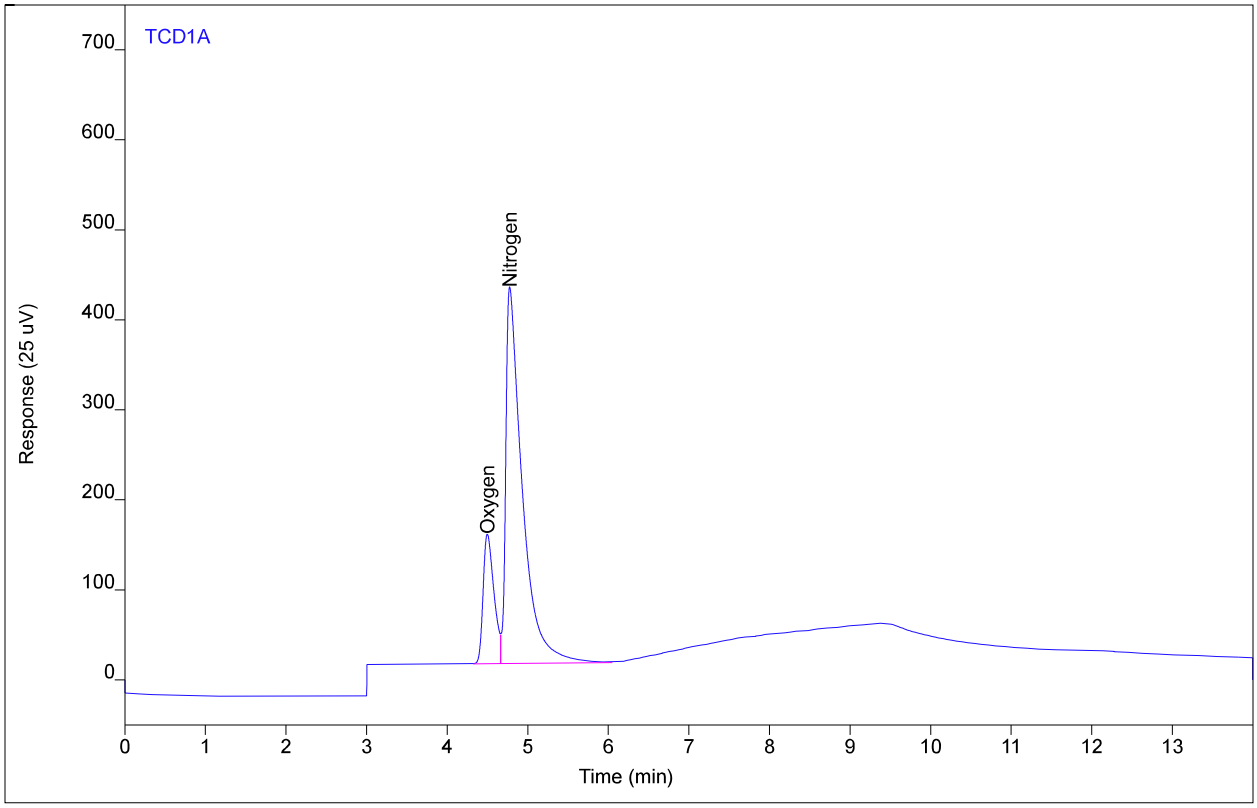
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.49	1557.86	169.699	5.03823	1	5.03823	%
Nitrogen	VV	4.76	6914.16	475.832	19.4291	1	19.4291	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Chimney (0072).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	013F0501.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 1:34 PM
File Modified	11/22/2021 11:20 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 13
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



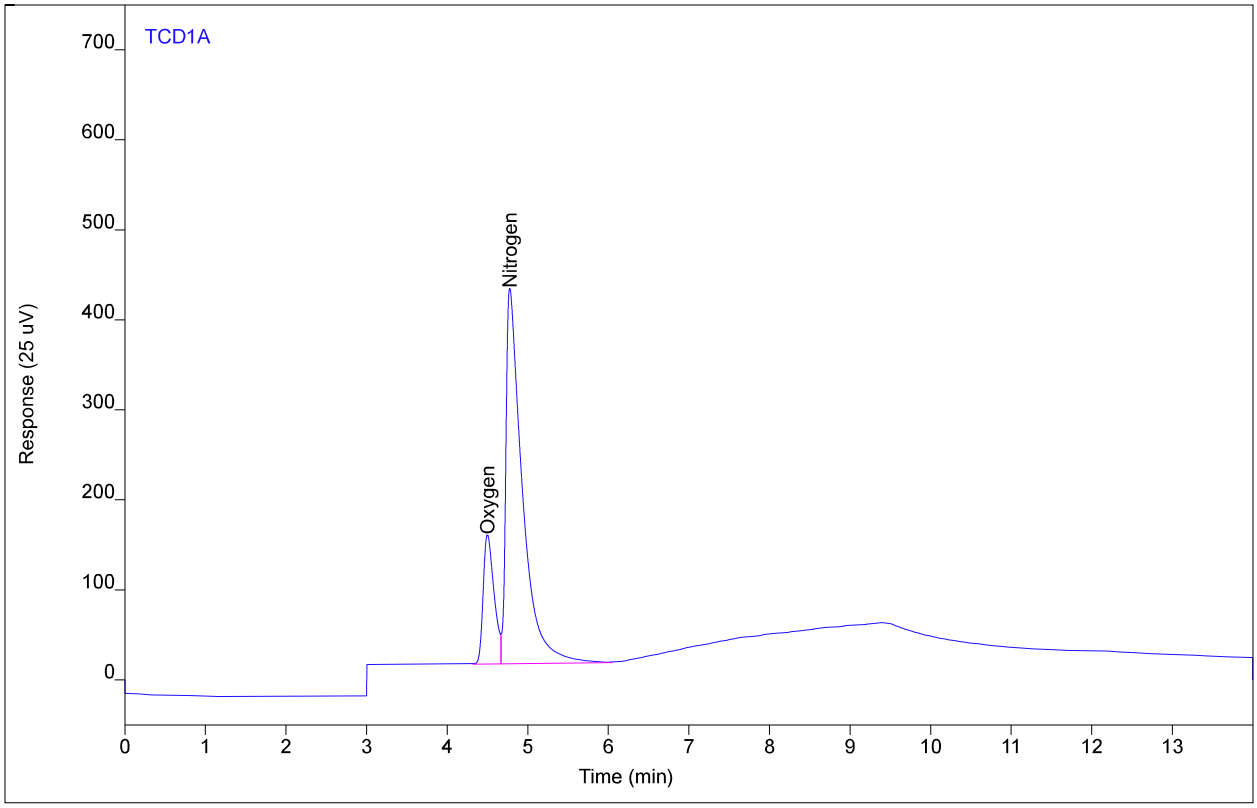
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.50	1342.95	144.170	4.31489	1	4.31489	%
Nitrogen	VV	4.78	5934.27	418.237	16.5449	1	16.5449	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Chimney (0072).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	013F0502.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 1:57 PM
File Modified	11/22/2021 11:20 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 13
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM



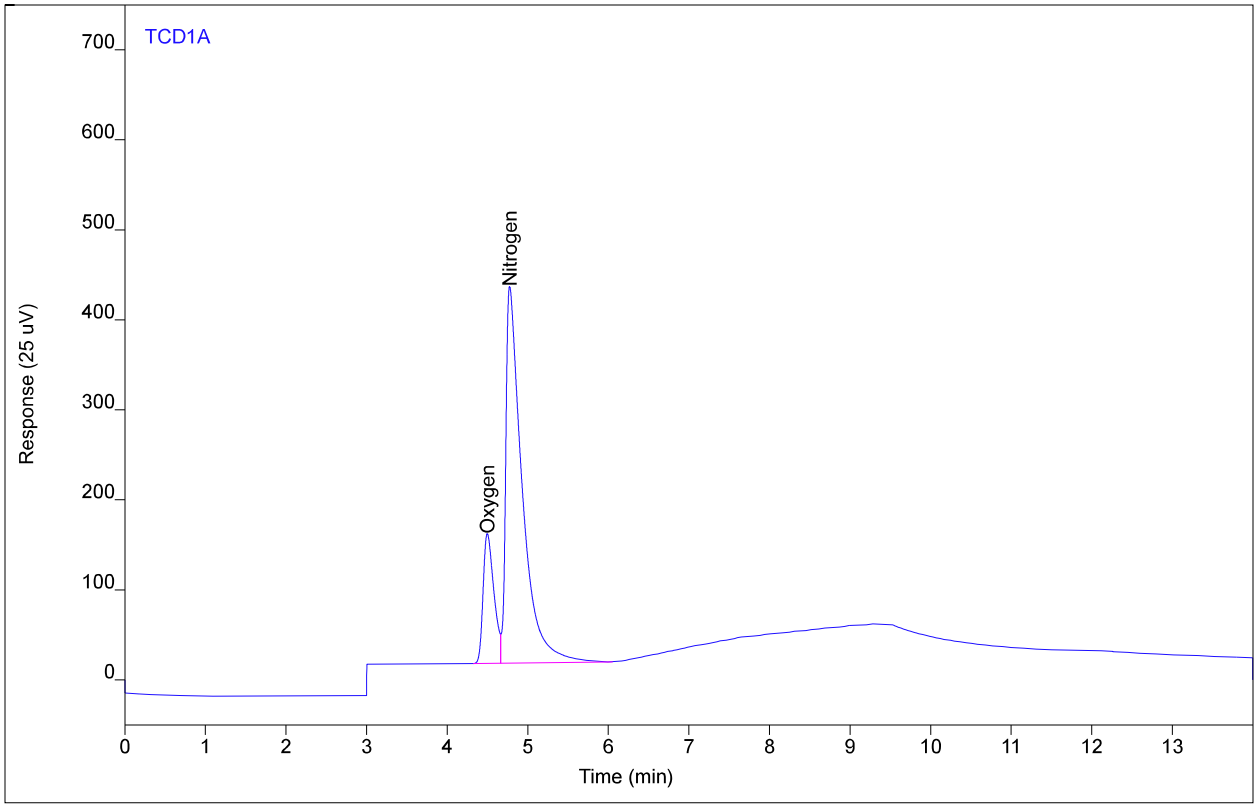
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.50	1341.51	143.797	4.31006	1	4.31006	%
Nitrogen	VV	4.78	5921.68	417.618	16.5078	1	16.5078	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	1121-078.Chimney (0072).Can
Sequence Name	BETTYP1613 ver.1
Inj Data File	013F0503.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 2:19 PM
File Modified	11/22/2021 11:20 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Sample
Vial Number	Vial 13
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM

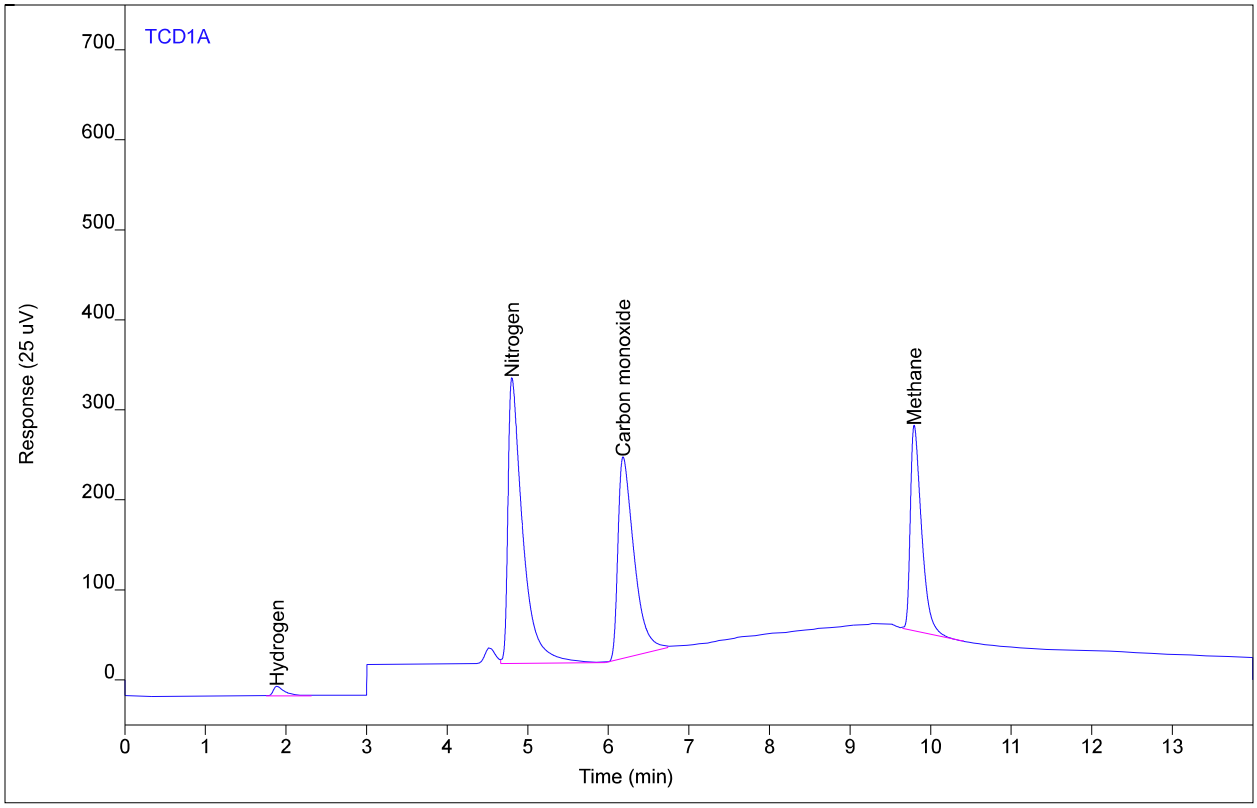


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen		(1.89)				1		
Oxygen	BV	4.50	1344.76	144.351	4.32100	1	4.32100	%
Nitrogen	VV	4.78	5949.03	418.994	16.5883	1	16.5883	%
Carbon monoxide		(6.21)				1		
Methane		(9.88)				1		
Carbon dioxide		(13.02)				1		

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 9
Inj Data File	009F0801.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	1 of 3
Injection Date	11/19/2021 4:06 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:20 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM

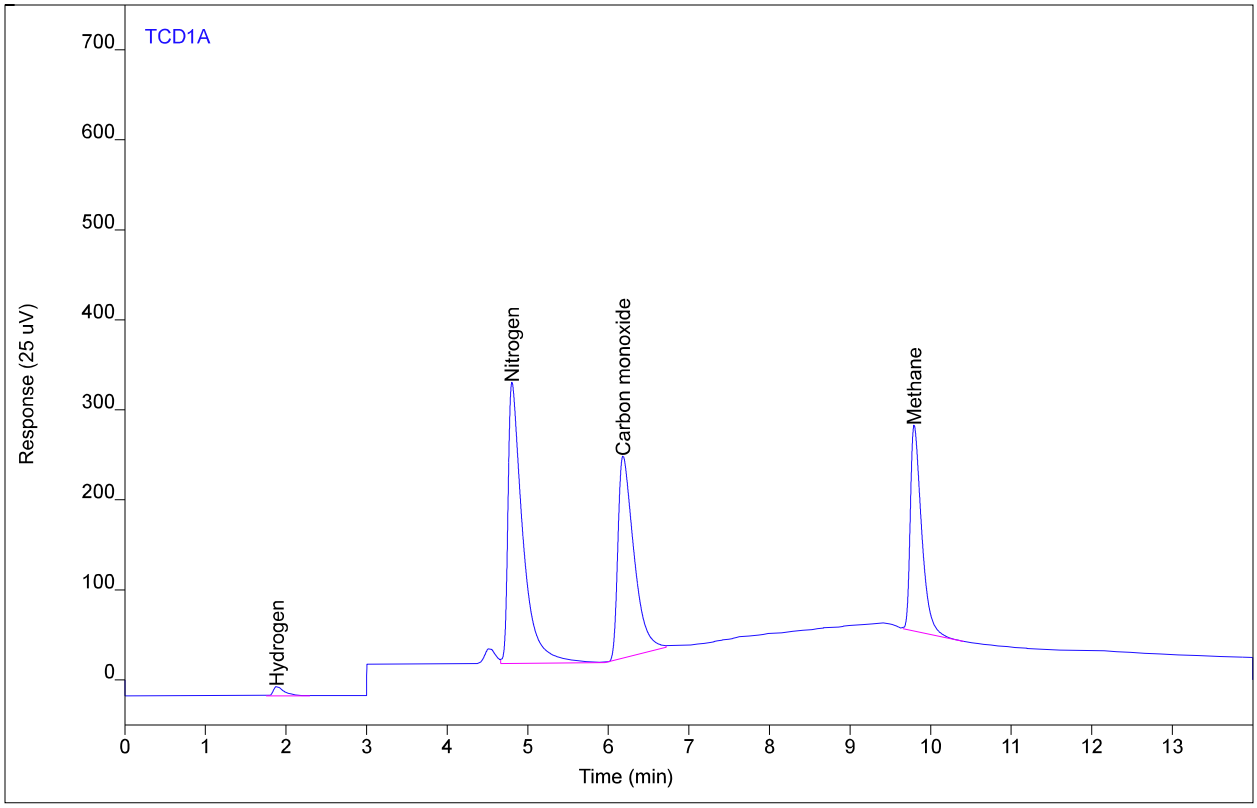


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	103.040	10.6522	8.24759	1	8.24759	%
Nitrogen	VV	4.80	4066.00	317.603	11.0457	1	11.0457	%
Carbon monoxide	VB	6.18	3106.85	223.929	9.61534	1	9.61534	%
Methane	BB	9.80	2206.90	228.236	7.77829	1	7.77829	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 9
Inj Data File	009F0802.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	2 of 3
Injection Date	11/19/2021 4:31 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:20 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM

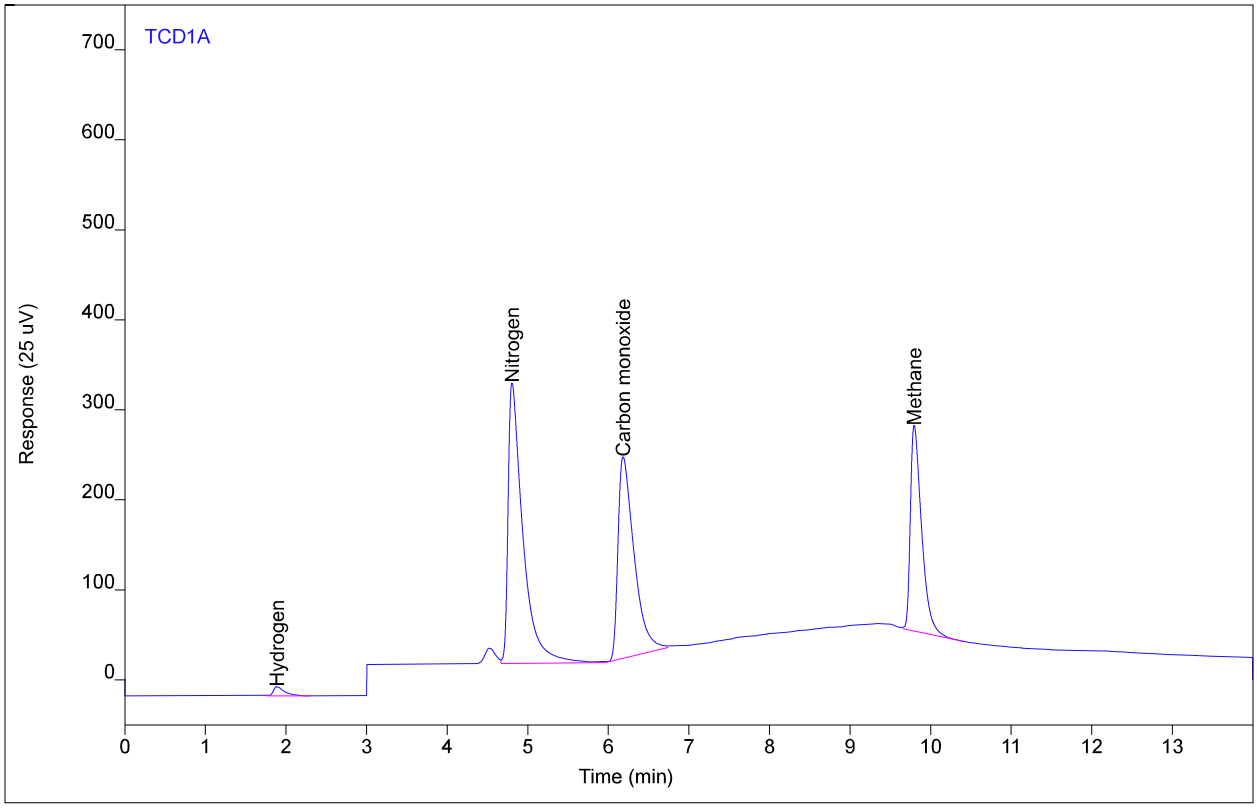


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	103.393	10.6895	8.27606	1	8.27606	%
Nitrogen	VV	4.80	3989.41	312.290	10.8202	1	10.8202	%
Carbon monoxide	VB	6.18	3104.13	224.555	9.60695	1	9.60695	%
Methane	BB	9.80	2223.85	228.767	7.83793	1	7.83793	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 9
Inj Data File	009F0803.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	3 of 3
Injection Date	11/19/2021 4:56 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:20 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM



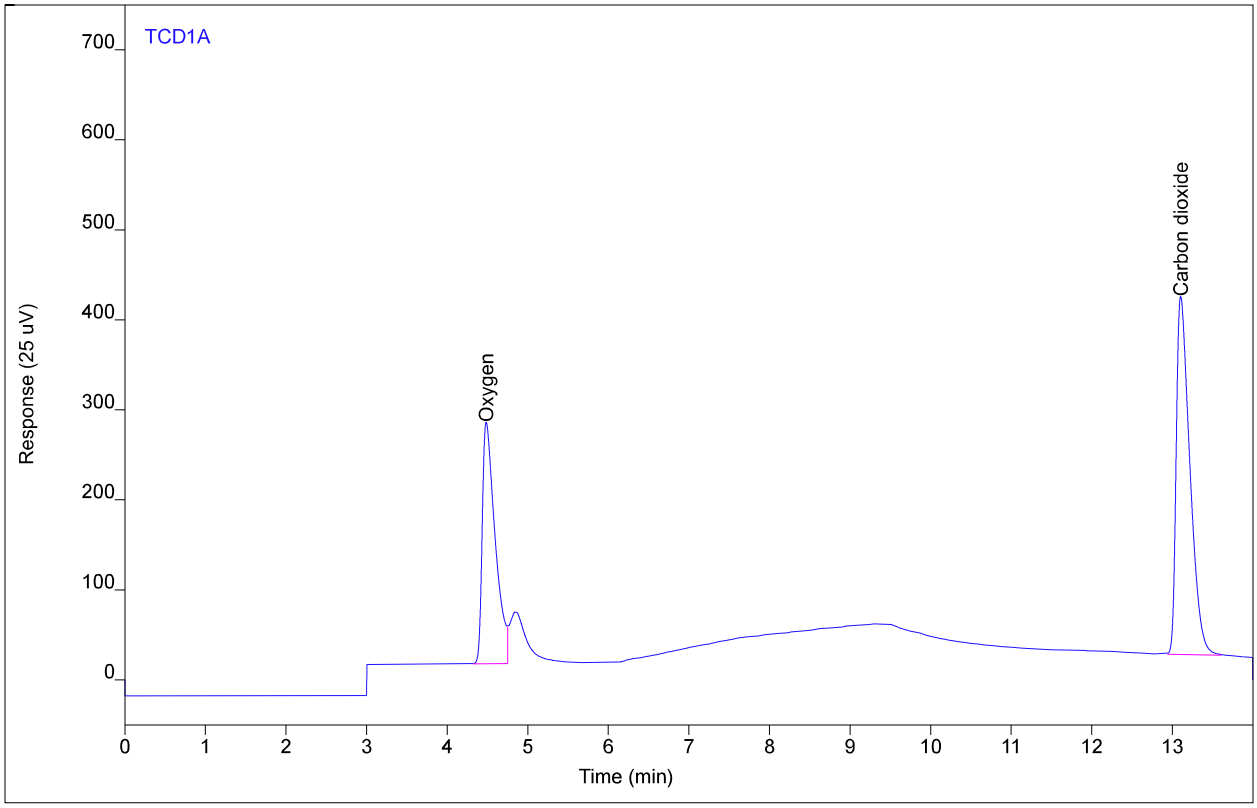
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	103.086	10.6065	8.25125	1	8.25125	%
Nitrogen	VV	4.81	3985.25	312.141	10.8080	1	10.8080	%
Carbon monoxide	VB	6.18	3110.46	224.090	9.62647	1	9.62647	%
Methane	BB	9.80	2216.05	228.385	7.81047	1	7.81047	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1537 #FG4 ENV(1=0,2=358.99)
Sequence Name	BETTYP1613 ver.1
Inj Data File	009F0901.D
File Location	GC/2021/Betty/Quarter 4
Injection Date	11/19/2021 5:21 PM
File Modified	11/22/2021 11:20 AM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	9/21/2021 8:56 AM
Printed	11/22/2021 1:39 PM

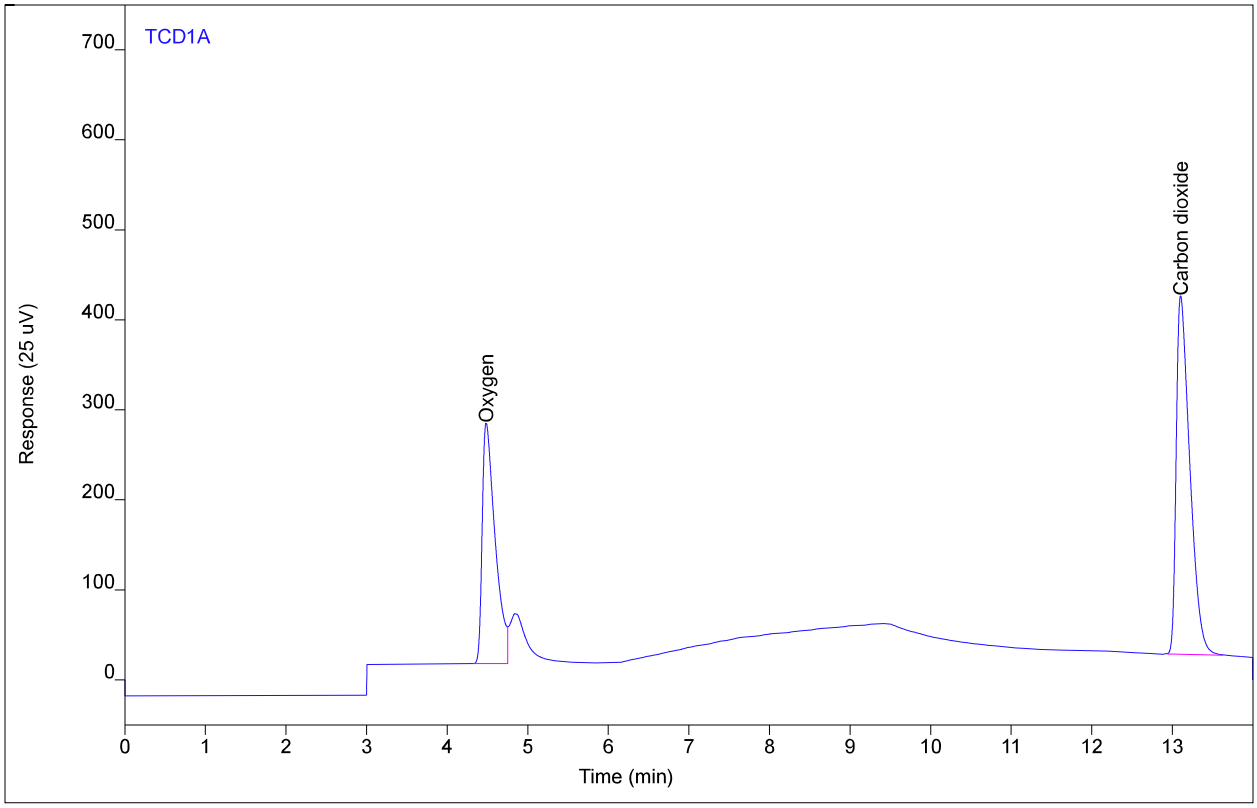


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BV	4.48	2997.28	268.409	9.88302	1	9.88302	%
Carbon dioxide	BB	13.10	4676.89	397.730	9.86661	1	9.86661	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1537 #FG4 ENV(1=0,2=358.99)	Sample Type	Calibration
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 9
Inj Data File	009F0902.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	2 of 3
Injection Date	11/19/2021 5:46 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:20 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM

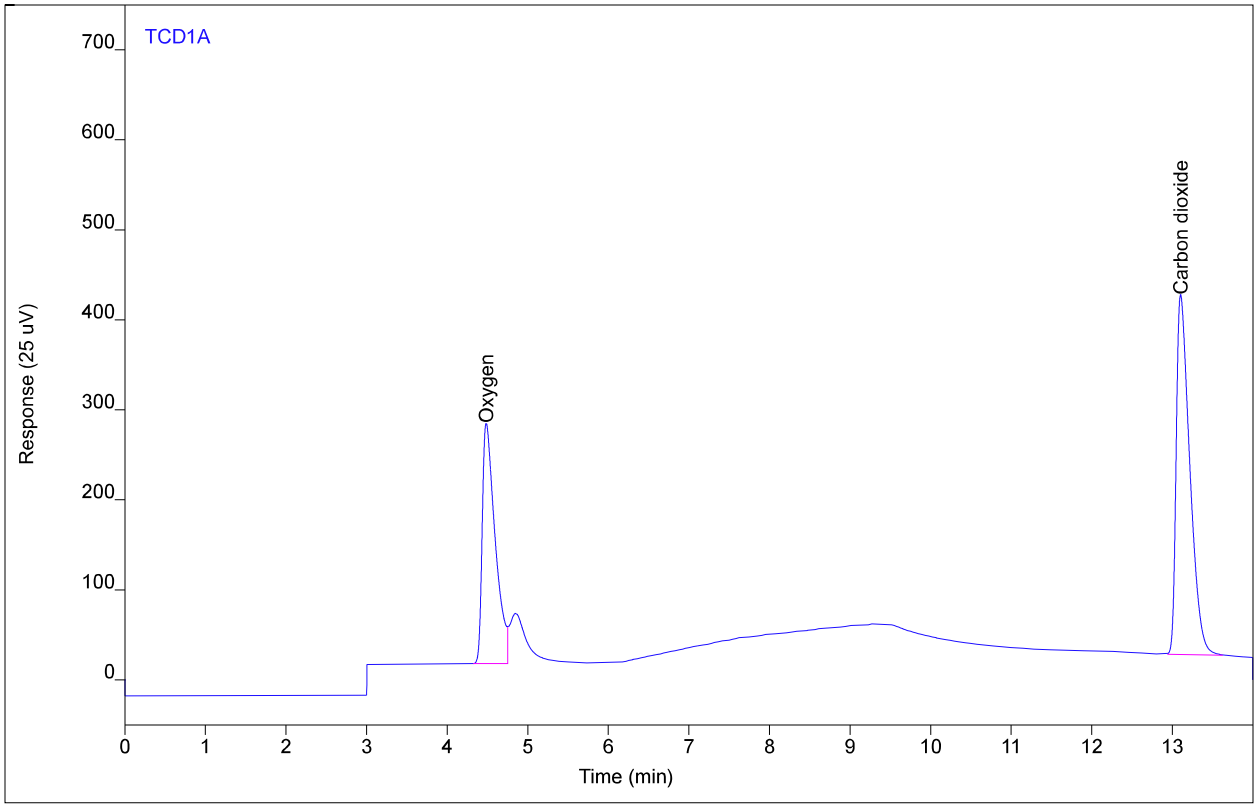


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BV	4.48	2995.61	267.679	9.87740	1	9.87740	%
Carbon dioxide	BB	13.10	4678.46	398.551	9.86993	1	9.86993	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1537 #FG4 ENV(1=0,2=358.99)	Sample Type	Calibration
Sequence Name	BETTYP1613 ver.1	Vial Number	Vial 9
Inj Data File	009F0903.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 4	Injection	3 of 3
Injection Date	11/19/2021 6:11 PM	Acquisition Method	GC142P133_CAL.M
File Modified	11/22/2021 11:20 AM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	9/21/2021 8:56 AM
Operator	Nicholas Traversa	Printed	11/22/2021 1:39 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BV	4.49	2991.96	267.455	9.86511	1	9.86511	%
Carbon dioxide	BB	13.10	4676.50	399.747	9.86578	1	9.86578	%

Calibration Table

Calib. Data Modified : 7/15/2021 7:25:31 AM

Rel. Reference Window : 2.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 2.000 %
Abs. Non-ref. Window : 0.200 min
Uncalibrated Peaks : not reported
Partial Calibration : Yes, identified peaks are recalibrated
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear
Origin : Connected
Weight : Quadratic (Amnt)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Signal 1: TCD1 A,
Signal 2: FID2 B,

RetTime [min]	Sig	Lvl	Amount [%]	Area	Amt/Area	Ref Grp	Name
1.892	1	6	5.96000e-1	8.38632	7.10682e-2		Hydrogen
		7	1.57500	19.32322	8.15081e-2		
		8	3.34000	39.48611	8.45867e-2		
		9	8.18600	100.87291	8.11516e-2		
		17	10.70000	135.00101	7.92587e-2		
		18	15.80000	200.40840	7.88390e-2		
		19	30.40000	404.05594	7.52371e-2		
4.536	1	1	6.39000e-1	253.61996	2.51952e-3		Oxygen
		2	2.44800	764.54264	3.20191e-3		
		3	4.21800	1268.91227	3.32411e-3		
		4	10.00000	2973.91968	3.36257e-3		
		23	99.99900	3.19562e4	3.12926e-3		
4.866	1	5	4.58000e-1	470.48026	9.73473e-4		Nitrogen
		6	7.41000e-1	560.50641	1.32202e-3		
		7	1.95900	983.68772	1.99149e-3		
		8	4.15300	1722.74129	2.41069e-3		
		9	10.18000	3806.36808	2.67447e-3		
		22	99.90000	3.40170e4	2.93677e-3		
6.206	1	5	4.53000e-1	139.66979	3.24336e-3		Carbon monoxide
		6	7.33000e-1	224.63095	3.26313e-3		
		7	1.93800	607.22402	3.19157e-3		
		8	4.10800	1293.26054	3.17647e-3		
		9	10.07000	3268.20003	3.08121e-3		
		25	99.50000	3.33624e4	2.98240e-3		
9.883	1	5	3.62000e-1	99.49029	3.63855e-3		Methane
		6	5.85000e-1	160.16267	3.65254e-3		
		7	1.54600	435.58744	3.54923e-3		

Method C:\GC\2021\BETTY\METHODS\BETTYP1563_FGA.M

RetTime [min]	Sig	Lvl	Amount [%]	Area	Amt/Area	Ref Grp	Name
		8	3.27700	916.46379	3.57570e-3		
		9	8.03300	2290.17847	3.50759e-3		
		24	99.99900	2.86959e4	3.48478e-3		
13.019	1	1	6.40000e-1	304.77520	2.09991e-3		Carbon dioxide
		2	2.45100	1154.09688	2.12374e-3		
		3	4.22200	1988.42489	2.12329e-3		
		4	10.01000	4778.16732	2.09495e-3		
		21	99.99000	4.75951e4	2.10084e-3		

More compound-specific settings:

Compound: Oxygen
  Time Window : From 4.240 min To 4.573 min

Compound: Nitrogen
  Time Window : From 4.520 min To 5.016 min

Compound: Carbon monoxide
  Time Window : From 6.031 min To 6.369 min

Compound: Methane
  Time Window : From 9.389 min To 10.082 min

Compound: Carbon dioxide
  Time Window : From 12.587 min To 13.250 min

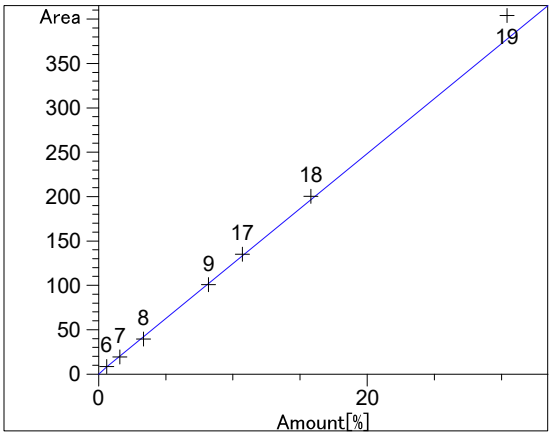
1 Warnings or Errors :

Warning : Overlapping peak time windows at 4.536 min, signal 1

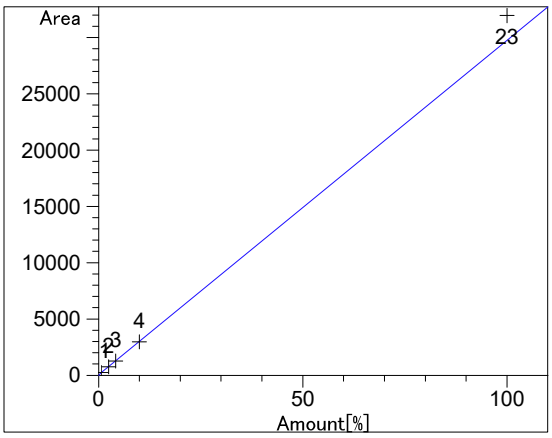
Peak Sum Table

No Entries in table

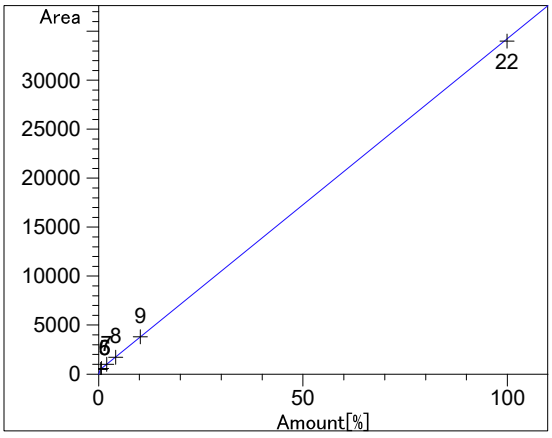
Calibration Curves



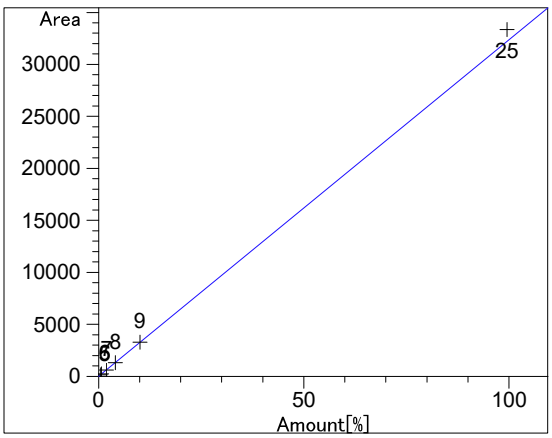
Hydrogen at exp. RT: 1.892
TCD1 A,
Correlation: 0.99851
Residual Std. Dev.: 12.01127
Formula: y = mx + b
  m: 12.39857
  b: 7.82104e-1
  x: Amount
  y: Area
Calibration Level Weights:
  Level 6 : 1
  Level 7 : 0.143196
  Level 8 : 0.031842
  Level 9 : 0.005301
  Level 17 : 0.003103
  Level 18 : 0.001423
  Level 19 : 0.000384



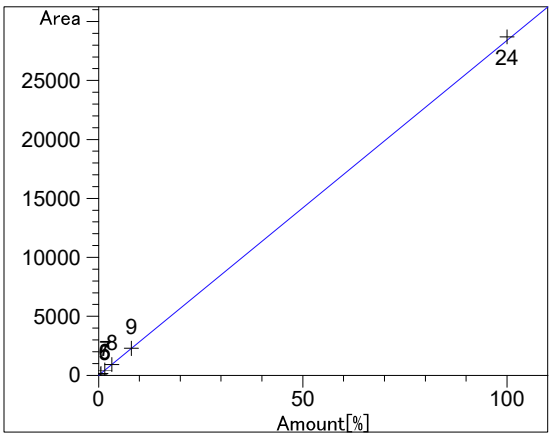
Oxygen at exp. RT: 4.536
TCD1 A,
Correlation: 0.99860
Residual Std. Dev.: 1262.19181
Formula: y = mx + b
m: 297.10689
b: 60.96457
x: Amount
y: Area
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.068136
Level 3 : 0.02295
Level 4 : 0.004083
Level 23 : 0.000041



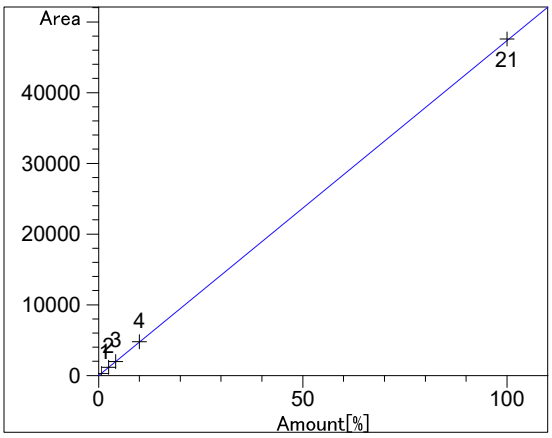
Nitrogen at exp. RT: 4.866
TCD1 A,
Correlation: 0.99990
Residual Std. Dev.: 119.24247
Formula: y = mx + b
m: 339.73444
b: 313.41079
x: Amount
y: Area
Calibration Level Weights:
Level 5 : 1
Level 6 : 0.382027
Level 7 : 0.054659
Level 8 : 0.012162
Level 9 : 0.002024
Level 22 : 0.000021



Carbon monoxide at exp. RT: 6.206
TCD1 A,
Correlation: 0.99961
Residual Std. Dev.: 562.54923
Formula: y = mx + b
m: 324.09231
b: -9.41087
x: Amount
y: Area
Calibration Level Weights:
Level 5 : 1
Level 6 : 0.381934
Level 7 : 0.054637
Level 8 : 0.01216
Level 9 : 0.002024
Level 25 : 0.000021



Methane at exp. RT: 9.883
TCD1 A,
Correlation: 0.99993
Residual Std. Dev.: 136.98580
Formula: y = mx + b
m: 284.26923
b: -4.23200
x: Amount
y: Area
Calibration Level Weights:
Level 5 : 1
Level 6 : 0.382918
Level 7 : 0.054827
Level 8 : 0.012203
Level 9 : 0.002031
Level 24 : 0.000013



Carbon dioxide at exp. RT: 13.019
TCD1 A,
Correlation: 0.99997
Residual Std. Dev.: 120.45393
Formula: y = mx + b
m: 473.93795
b: 7.31569e-1
x: Amount
y: Area
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.068183
Level 3 : 0.022979
Level 4 : 0.004088
Level 21 : 0.000041

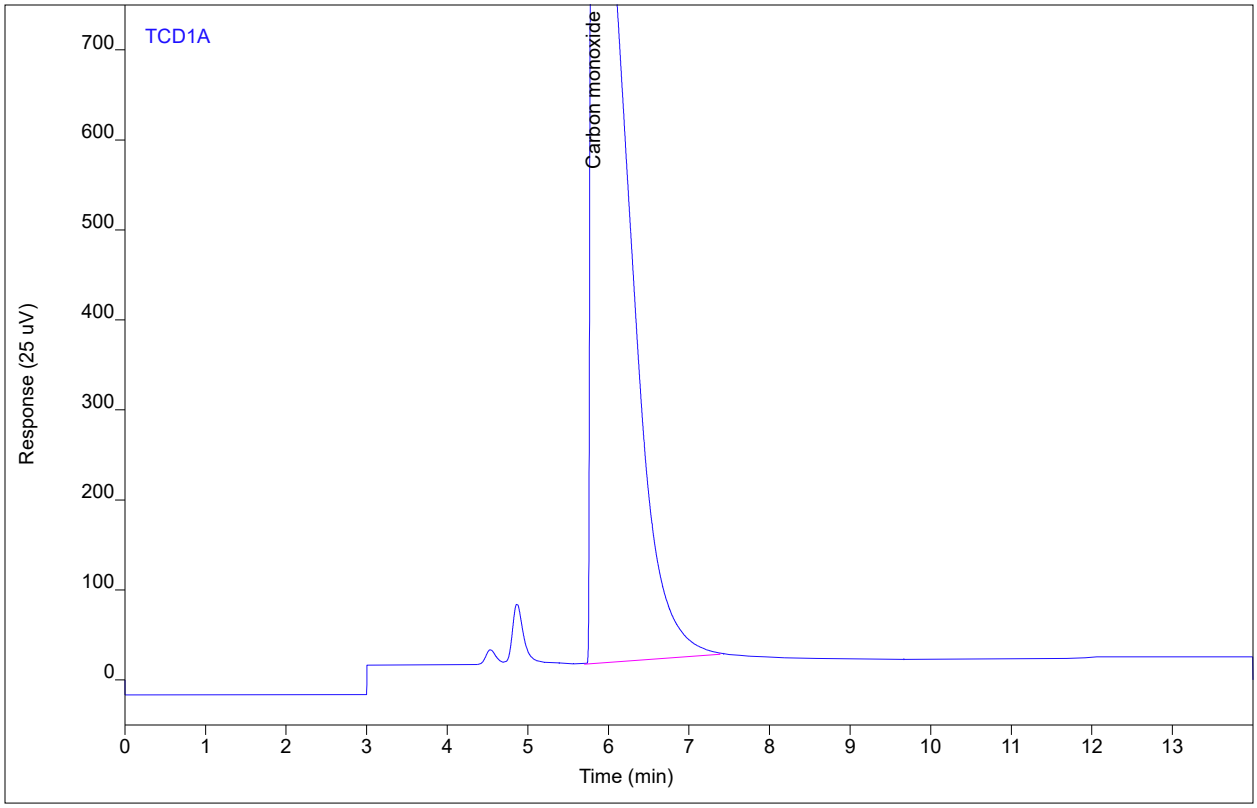
==========

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG25 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0101.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 8:06 AM
File Modified	7/13/2021 2:38 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



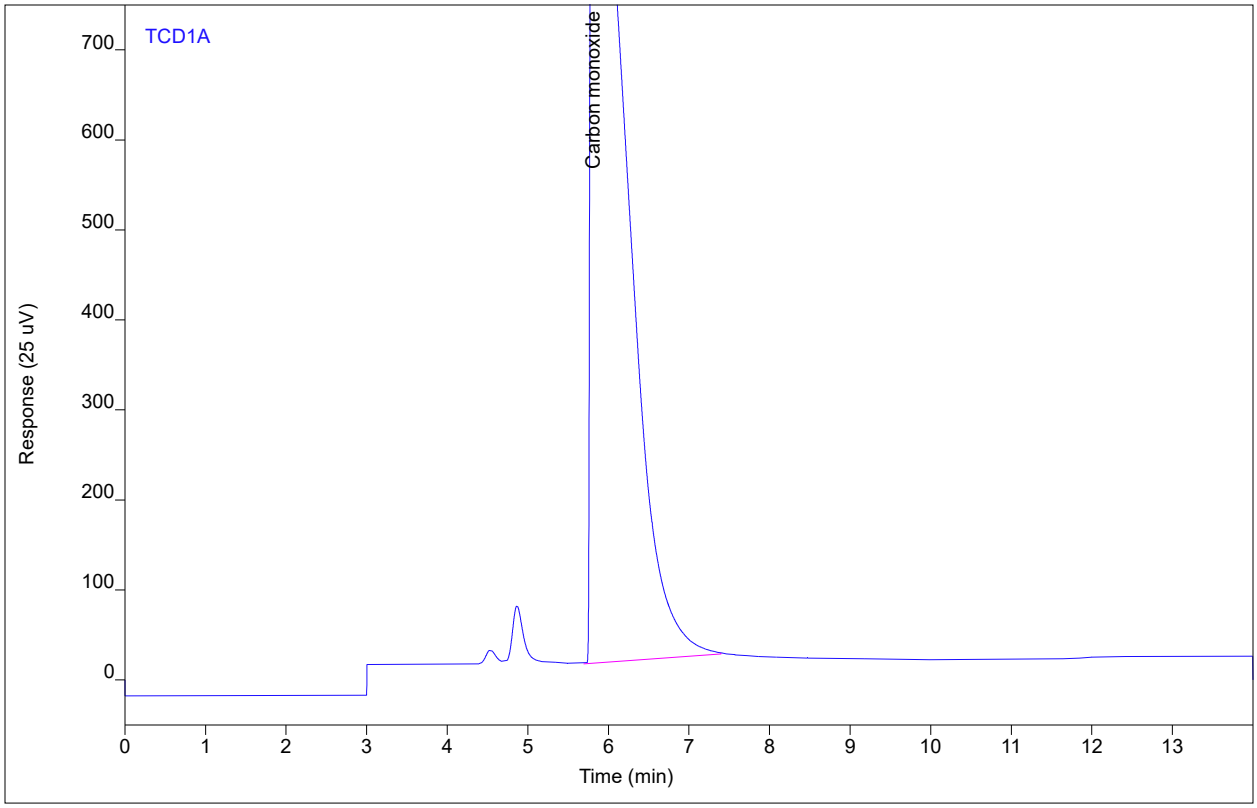
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Carbon monoxide	BB	5.81	33159.3	1225.69	102.343	1	102.343	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG25 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0102.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 8:32 AM
File Modified	7/13/2021 2:38 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



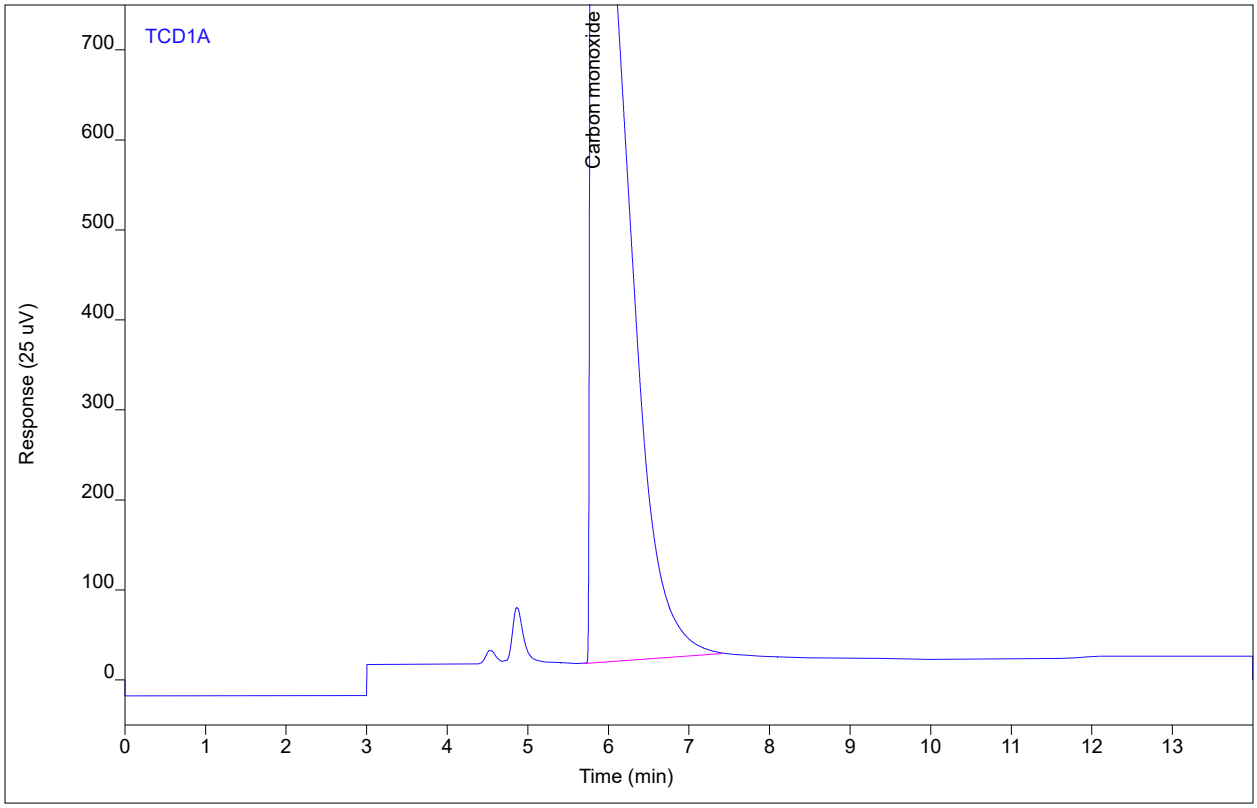
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Carbon monoxide	BB	5.81	33371.9	1228.90	102.999	1	102.999	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG25 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0103.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 8:57 AM
File Modified	7/13/2021 2:38 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



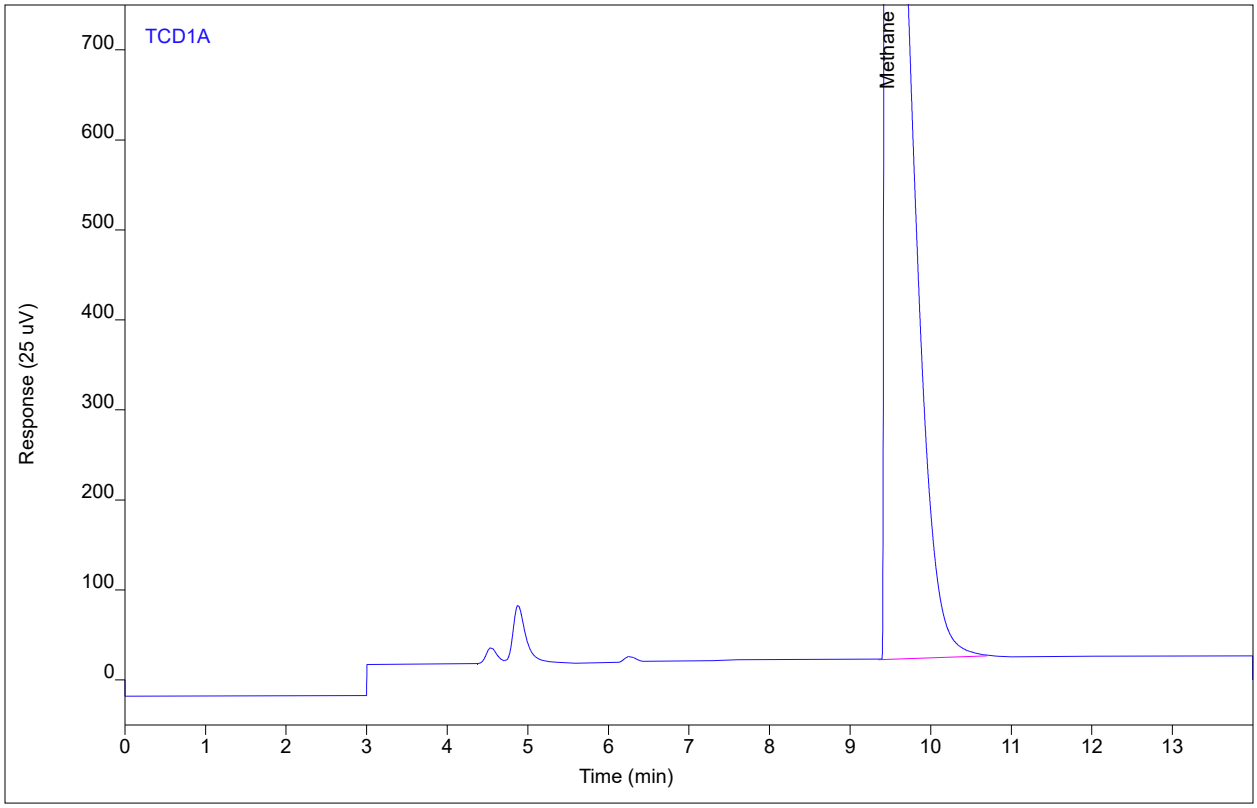
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Carbon monoxide	BB	5.81	33555.9	1235.40	103.567	1	103.567	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG24 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0201.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 9:28 AM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



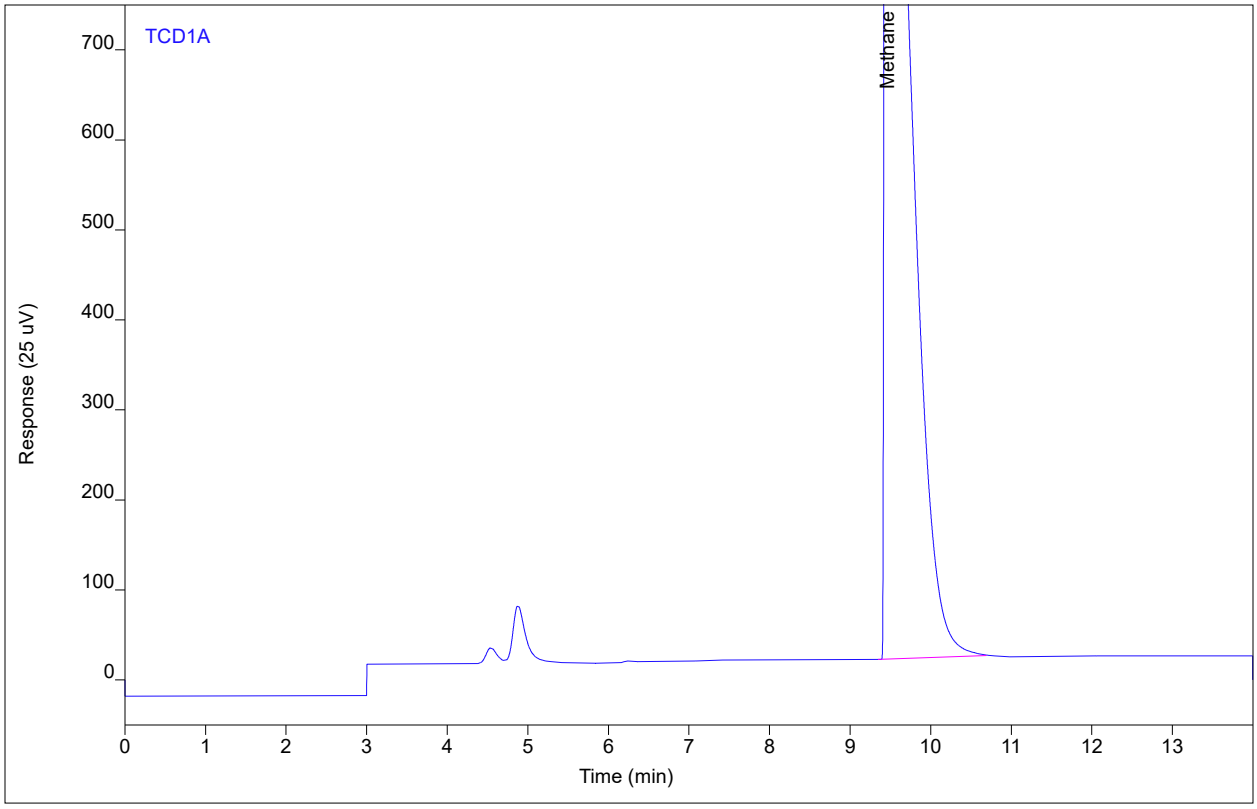
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methane	BB	9.46	28820.5	1441.00	101.399	1	101.399	%

Chromatogram Report

Sample Name	BettyP1401 #FG24 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0202.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 9:54 AM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



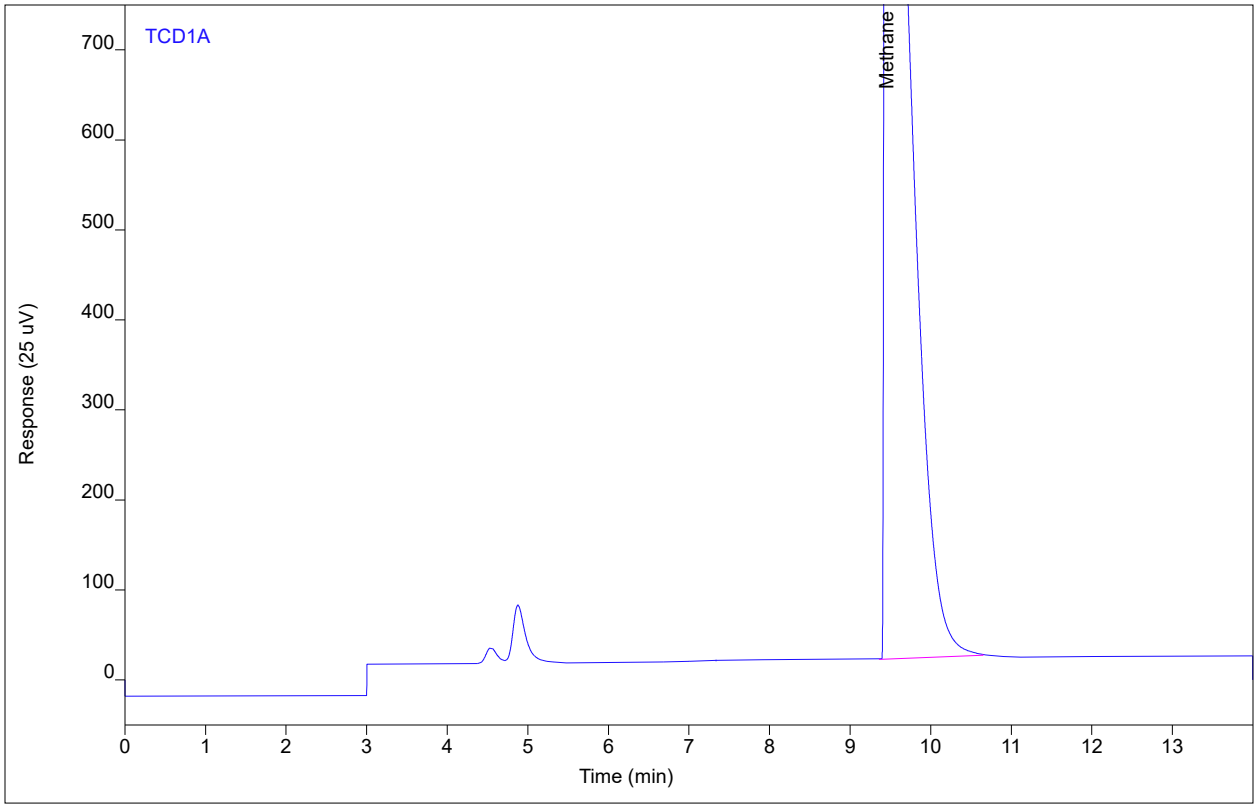
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methane	BB	9.46	28640.1	1433.83	100.765	1	100.765	%

Chromatogram Report

Sample Name	BettyP1401 #FG24 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0203.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 10:19 AM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



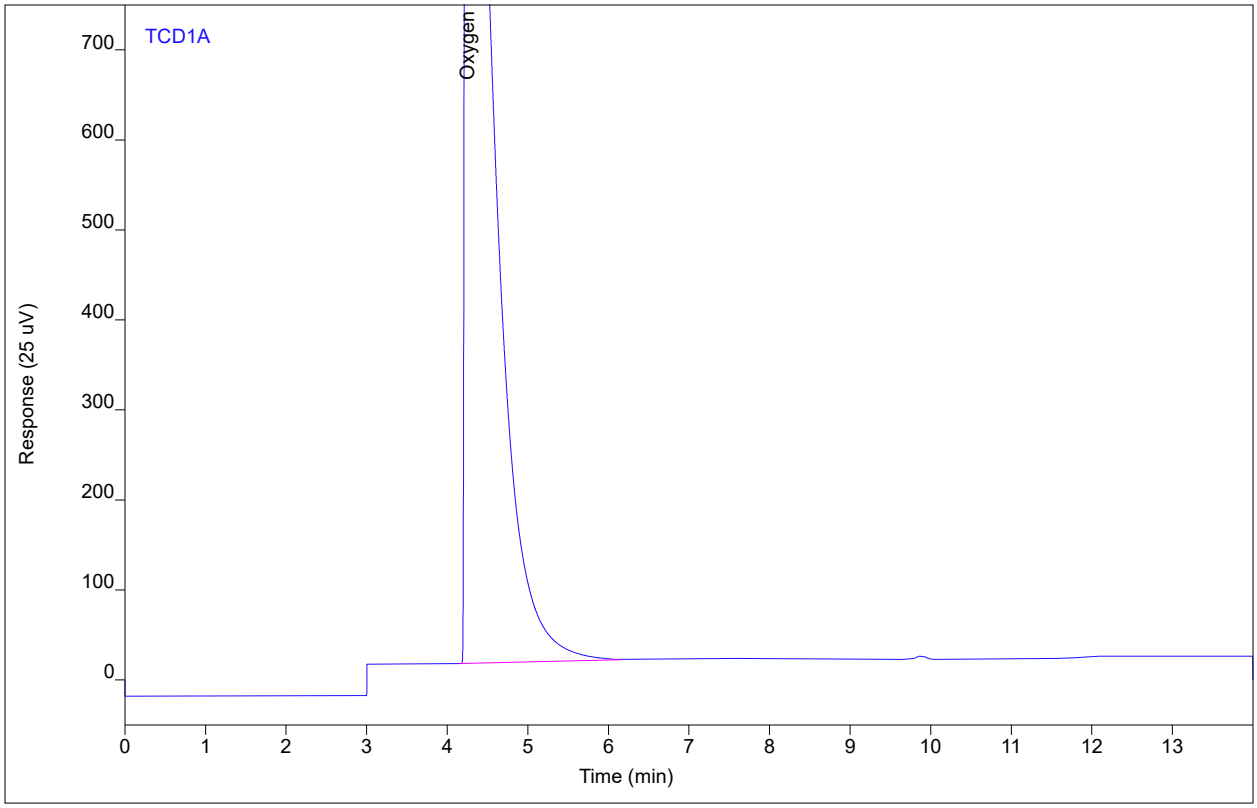
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methane	BB	9.46	28627.2	1438.31	100.719	1	100.719	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG23 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0301.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 10:53 AM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM

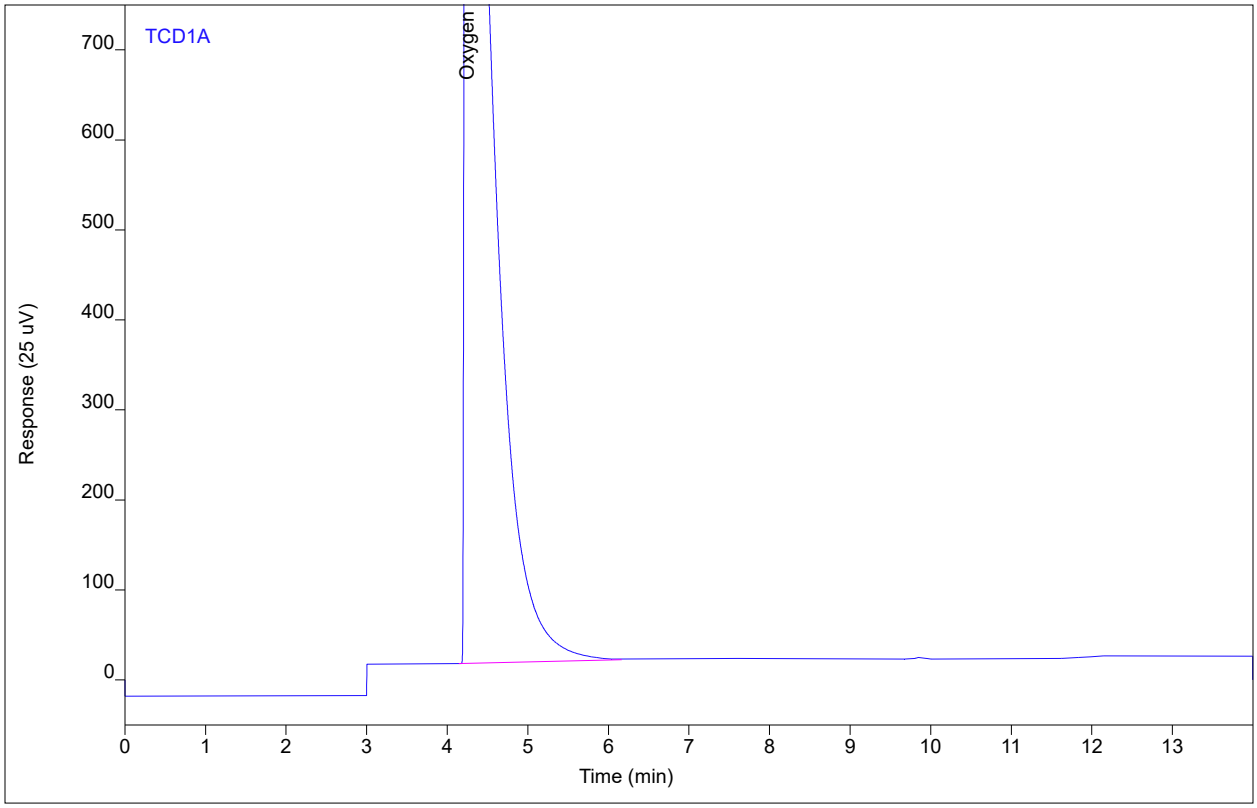


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BB	4.25	32150.9	1472.46	108.008	1	108.008	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG23 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1563 ver.2	Vial Number	Vial 9
Inj Data File	009F0302.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 3	Injection	2 of 3
Injection Date	7/11/2021 11:18 AM	Acquisition Method	GC142P133_CAL.M
File Modified	7/13/2021 2:39 PM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	7/13/2021 2:38 PM
Operator	Nicholas Traversa	Printed	7/20/2021 8:51 AM

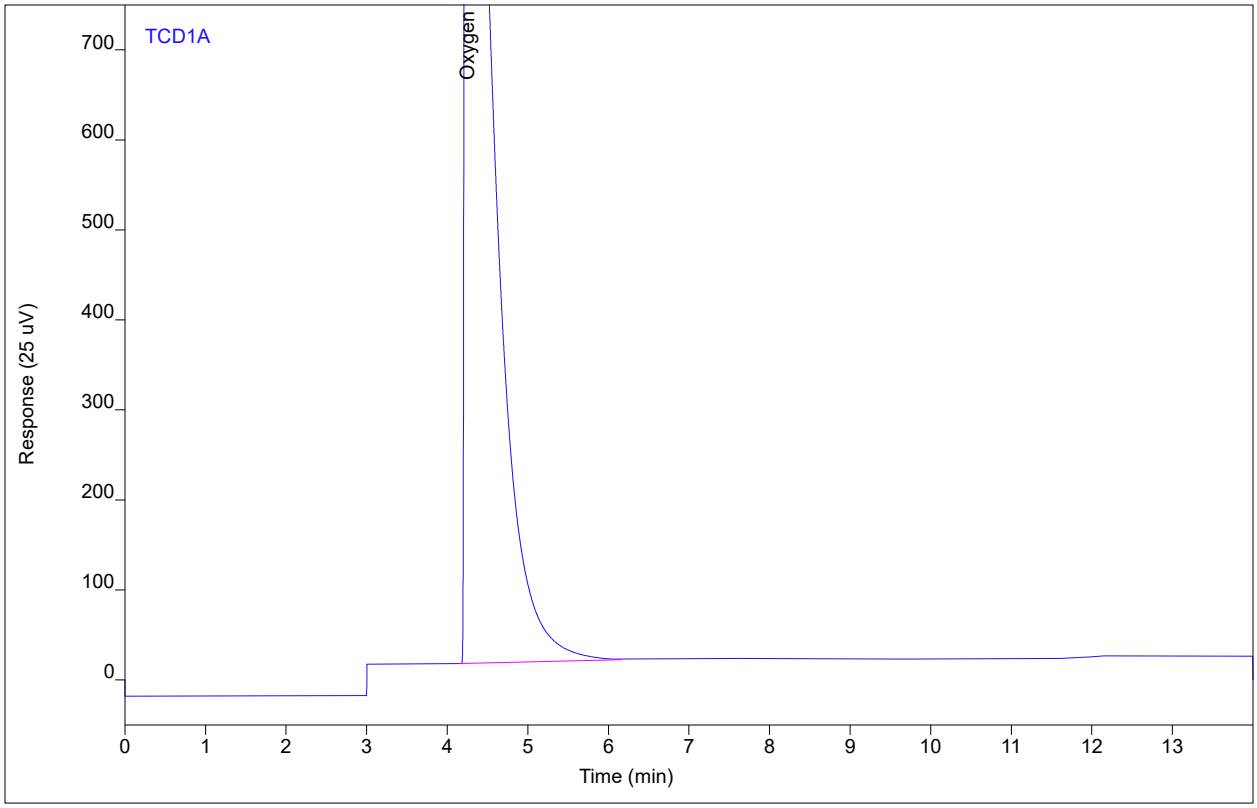


Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BB	4.24	31858.5	1462.25	107.024	1	107.024	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG23 ENV(1=0,3=377.15)	Sample Type	Calibration
Sequence Name	BETTYP1563 ver.2	Vial Number	Vial 9
Inj Data File	009F0303.D	Injection Volume	250
File Location	GC/2021/Betty/Quarter 3	Injection	3 of 3
Injection Date	7/11/2021 11:43 AM	Acquisition Method	GC142P133_CAL.M
File Modified	7/13/2021 2:39 PM	Analysis Method	BETTYP1563_FGA.M
Instrument		Method Modified	7/13/2021 2:38 PM
Operator	Nicholas Traversa	Printed	7/20/2021 8:51 AM



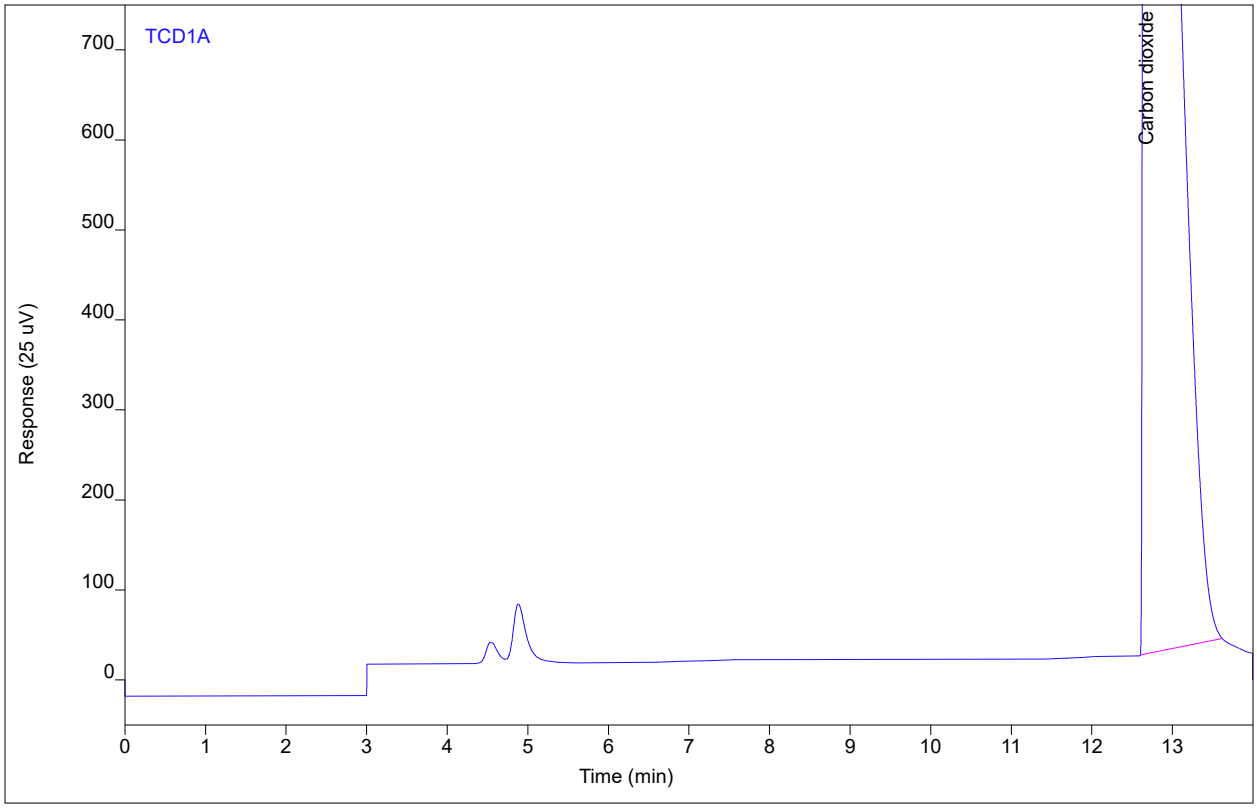
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Oxygen	BB	4.24	31859.1	1460.93	107.026	1	107.026	%

Chromatogram Report

Sample Name	BettyP1401 #FG21 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0401.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 12:09 PM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	1 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



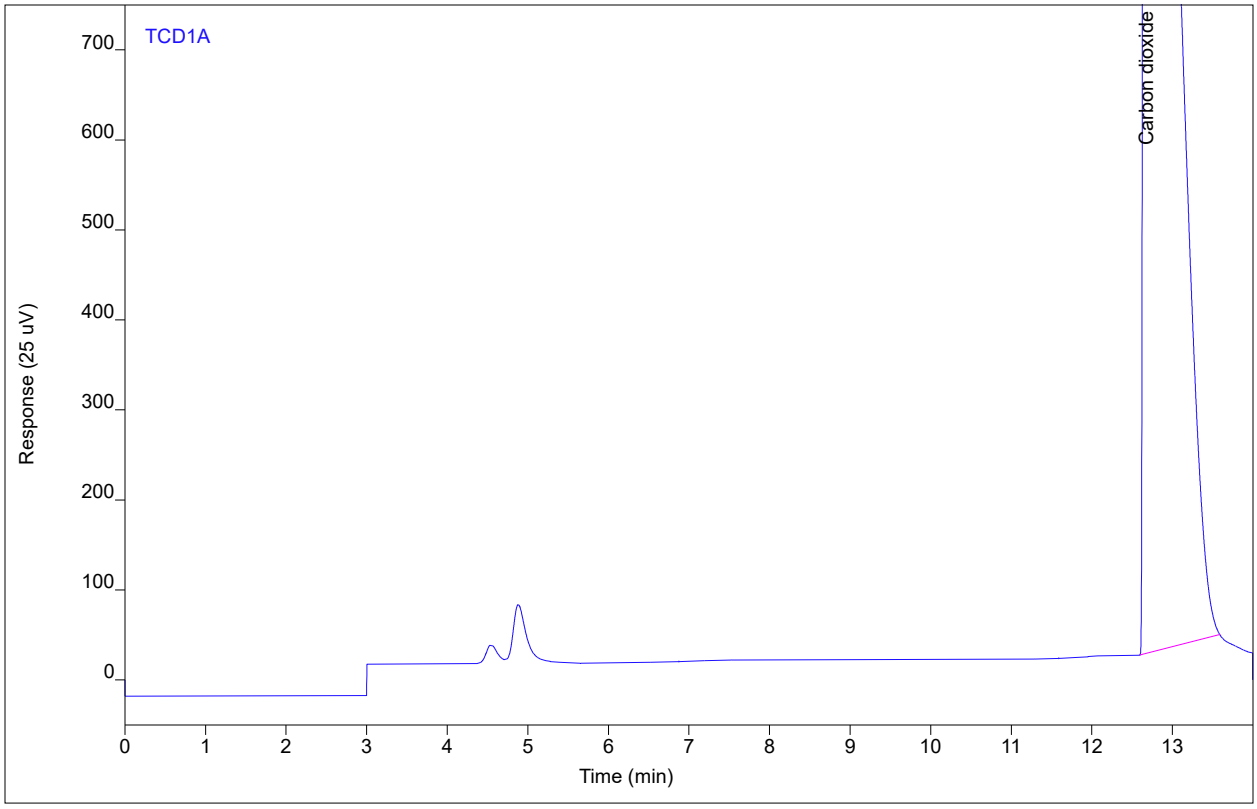
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Carbon dioxide	MM	12.67	47434.2	1979.43	100.084	1	100.084	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1401 #FG21 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0402.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 12:34 PM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	2 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



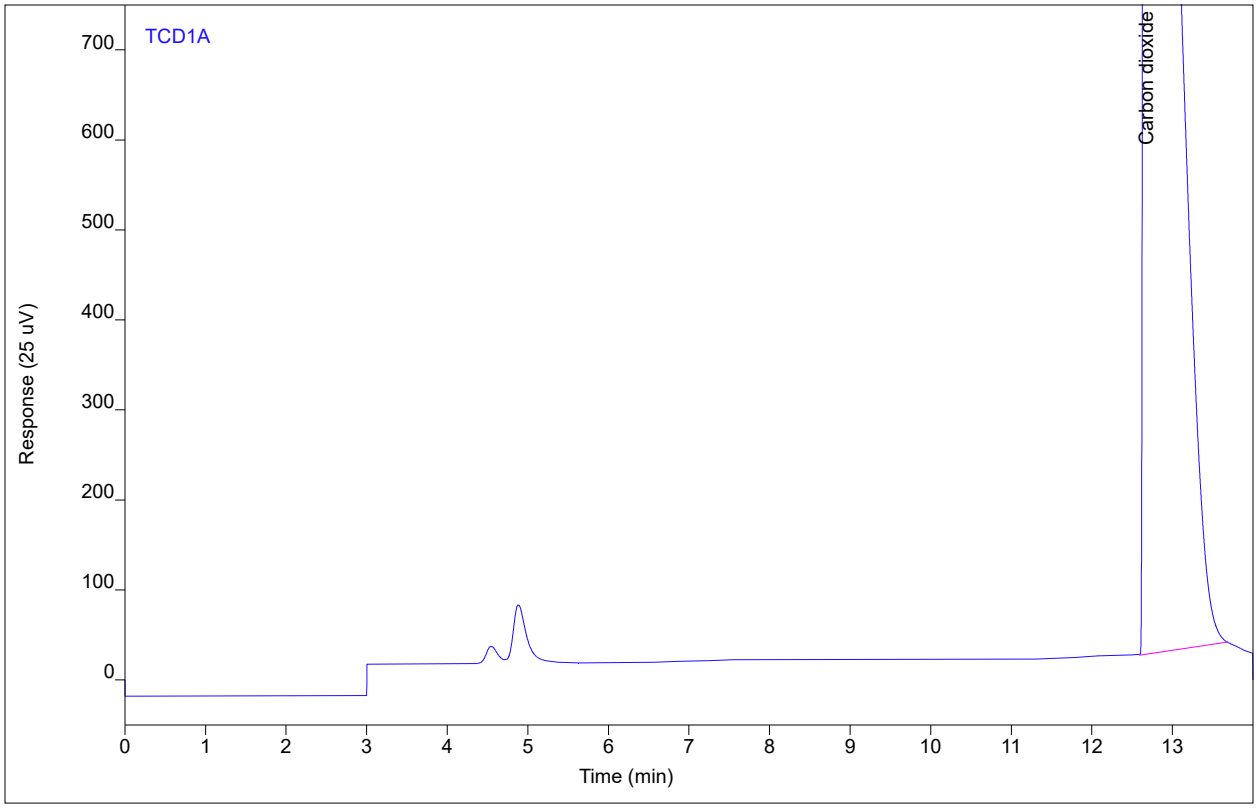
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Carbon dioxide	MM	12.68	47488.9	1982.04	100.199	1	100.199	%

Chromatogram Report

Sample Name	BettyP1401 #FG21 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0403.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 12:59 PM
File Modified	7/13/2021 2:39 PM
Instrument	
Operator	Nicholas Traversa

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	3 of 3
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



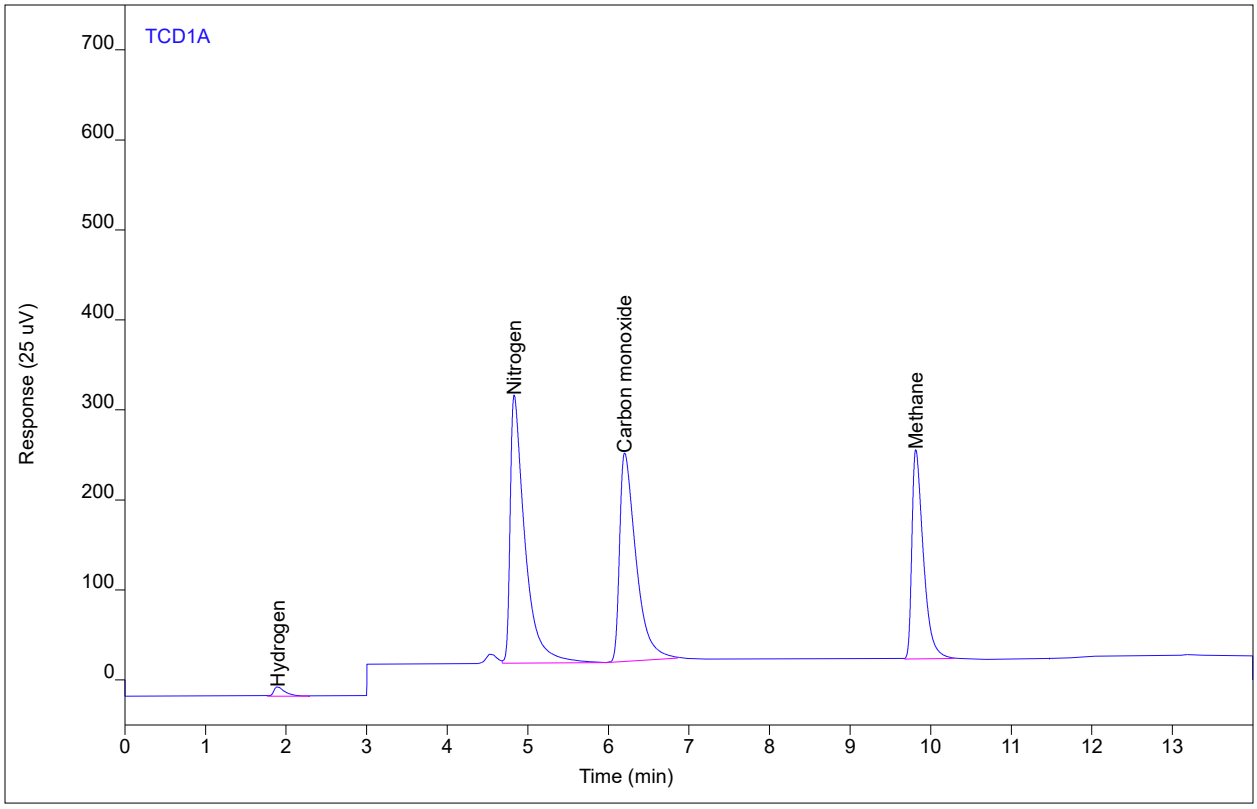
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Carbon dioxide	MM	12.68	47862.4	1985.33	100.987	1	100.987	%

Chromatogram Report

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0602.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 2:05 PM
File Modified	7/13/2021 2:28 PM
Instrument	
Operator	Nicholas Traversa

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	2 of 4
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



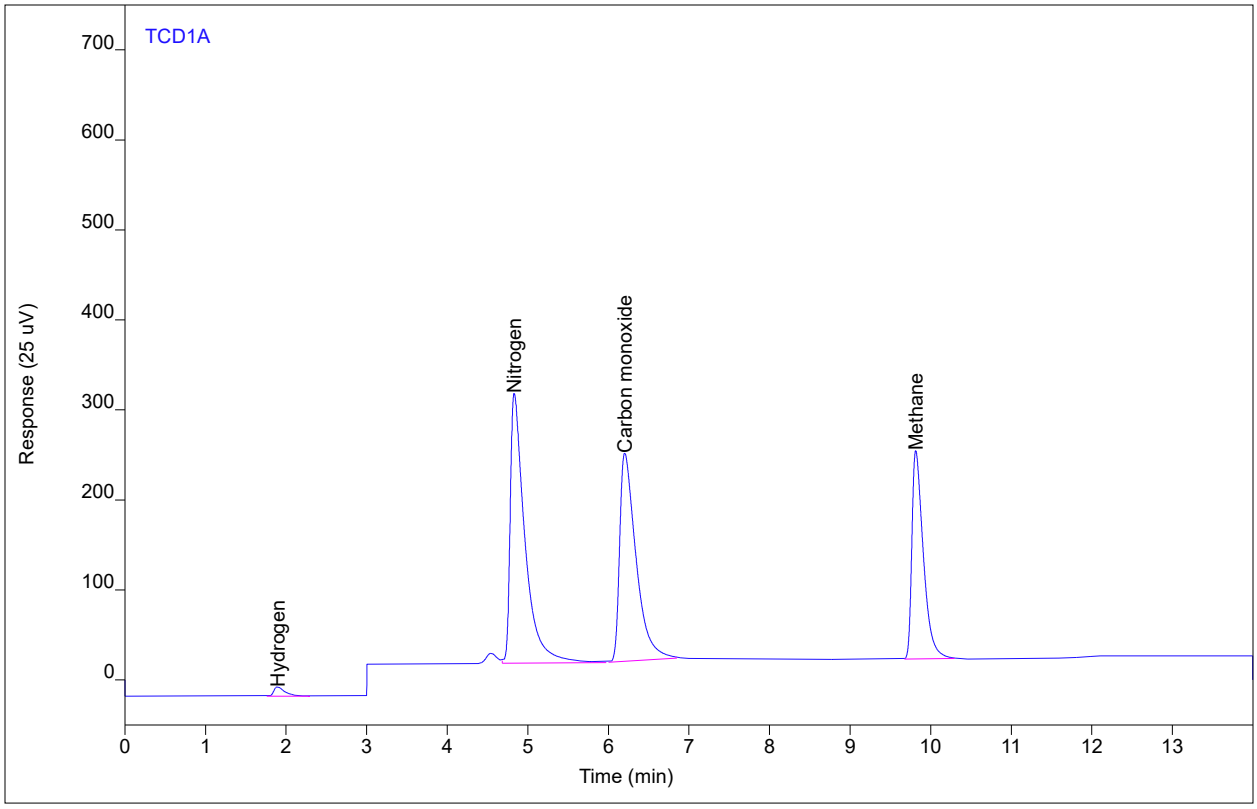
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	101.017	10.7437	8.08438	1	8.08438	%
Nitrogen	VV	4.83	3787.76	298.029	10.2267	1	10.2267	%
Carbon monoxide	VB	6.20	3272.50	231.842	10.1265	1	10.1265	%
Methane	BB	9.82	2295.53	232.925	8.09007	1	8.09007	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0603.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 2:30 PM
File Modified	7/13/2021 2:29 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	3 of 4
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



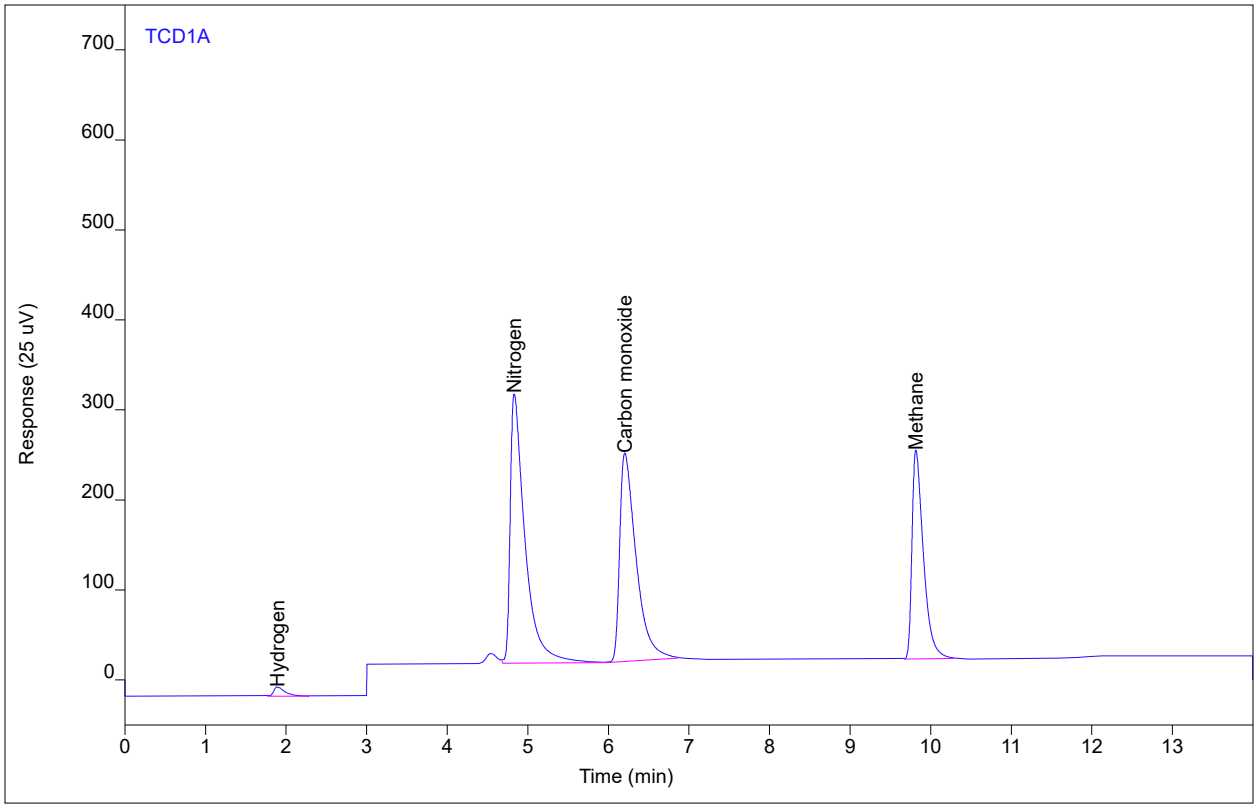
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	100.953	10.7459	8.07921	1	8.07921	%
Nitrogen	VB	4.83	3812.93	300.108	10.3008	1	10.3008	%
Carbon monoxide	BB	6.20	3263.44	231.783	10.0985	1	10.0985	%
Methane	BB	9.82	2288.55	231.514	8.06554	1	8.06554	%

Chromatogram Report

Enthalpy Analytical

Sample Name	BettyP1533 #FG9 ENV(1=0,3=377.15)
Sequence Name	BETTYP1563 ver.2
Inj Data File	009F0604.D
File Location	GC/2021/Betty/Quarter 3
Injection Date	7/11/2021 2:56 PM
File Modified	7/13/2021 2:29 PM
Instrument	
Operator	Nicholas Traversa

Sample Type	Calibration
Vial Number	Vial 9
Injection Volume	250
Injection	4 of 4
Acquisition Method	GC142P133_CAL.M
Analysis Method	BETTYP1563_FGA.M
Method Modified	7/13/2021 2:38 PM
Printed	7/20/2021 8:51 AM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Hydrogen	BB	1.89	100.649	10.7264	8.05472	1	8.05472	%
Nitrogen	VV	4.83	3818.41	299.663	10.3169	1	10.3169	%
Carbon monoxide	VB	6.20	3268.66	231.529	10.1146	1	10.1146	%
Methane	BB	9.82	2286.46	232.289	8.05816	1	8.05816	%