

Energy Laboratories Inc

ANALYTICAL RUN Summary

20-Sep-21

Run ID FID-HEADSPACE_210120A

Run Start Date: 1/20/2021

Analyst: Jeff Whitmer

Ical:

Column ID: porapak Q

Comments: thermometer used for temp:S94278.

Instrument ID	Description
1000_SGE_041819	1000 mL SGE Syringe _ Gas Tight

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
10711	HC-Methane-W-CCV	0.3	ml			lcs	8/9/2022
12173	HC-Methane-W-CCV	0.3	ml			CCV	11/23/2023

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
14188877	MBLK	HC-METHANE-	MBLK		1/20/2021 11:50:	1	R355741		0	0					
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD Q
Ethane	A	mg/L		0			0	0	0.00031	0.001	0	0%	0	0	0%
Ethene	A	mg/L		0			0	0	0.00023	0.001	0	0%	0	0	0%
Methane	A	mg/L		0			0	0	0.000704	0.001	0	0%	0	0	0%
Ethylene	X	mg/L		0			0	0	0.001	0.001	0	0%	0	0	0%

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
14188879	Cal1	HC-METHANE-	CAL1		1/20/2021 11:54:	1	R355741		0	0					
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD Q
Ethane	A	ppm		2.66692829		2.5	0	0	2	2	0	107%	50	150	0%
Ethene	A	ppm		2.68217219		2.5	0	0	2	2	0	107%	50	150	0%
Methane	A	ppm		2.9330938		2.5	0	0	2	2	0	117%	50	150	0%
Ethylene	X	ppm		2.68217219		1000	0	0	2	2	0	0%	0	0	0%

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
14188881	Cal2	HC-METHANE-	CAL2		1/20/2021 12:00:	1	R355741		0	0					
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD Q

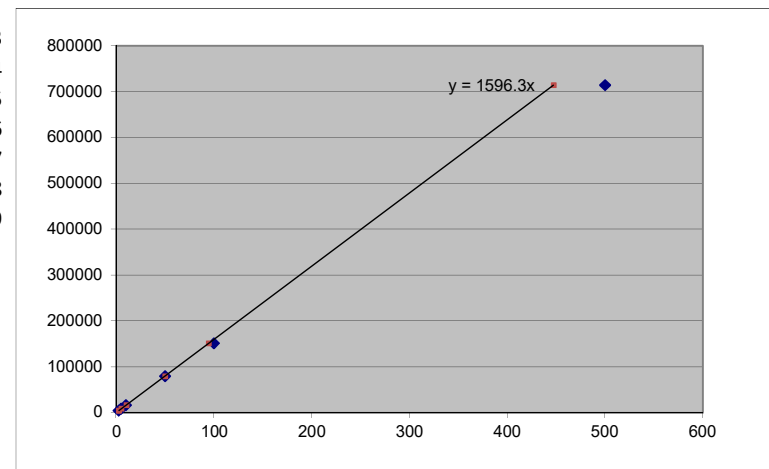
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188881	Cal2	HC-METHANE-	CAL2		1/20/2021 12:00:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		5.15876183		5	0	0	2	2	0	103%	85	115	0%	
Ethene	A	ppm		5.18455183		5	0	0	2	2	0	104%	85	115	0%	
Methane	A	ppm		5.47590194		5	0	0	2	2	0	110%	85	115	0%	
Ethylene	X	ppm		5.18455183		1000	0	0	2	2	0	1%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188883	Cal3	HC-METHANE-	CAL3		1/20/2021 12:04:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		10.3740375		10	0	0	2	2	0	104%	85	115	0%	
Ethene	A	ppm		10.2107455		10	0	0	2	2	0	102%	85	115	0%	
Methane	A	ppm		10.5521213		10	0	0	2	2	0	106%	85	115	0%	
Ethylene	X	ppm		10.2107455		1000	0	0	2	2	0	1%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188885	Cal4	HC-METHANE-	CAL4		1/20/2021 12:09:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		50.4828227		50	0	0	2	2	0	101%	85	115	0%	
Ethene	A	ppm		50.7731613		50	0	0	2	2	0	102%	85	115	0%	
Methane	A	ppm		49.9741048		50	0	0	2	2	0	100%	85	115	0%	
Ethylene	X	ppm		50.7731613		1000	0	0	2	2	0	5%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188887	Cal5	HC-METHANE-	CAL5		1/20/2021 12:14:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		96.640217		100	0	0	2	2	0	97%	85	115	0%	
Ethene	A	ppm		96.3665695		100	0	0	2	2	0	96%	85	115	0%	
Methane	A	ppm		94.8118498		100	0	0	2	2	0	95%	85	115	0%	
Ethylene	X	ppm		96.3665695		1000	0	0	2	2	0	10%	0	0	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188889	Cal6	HC-METHANE-	CAL6		1/20/2021 12:22:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		444.006974		500	0	0	2	2	0	89%	85	115	0%	
Ethene	A	ppm		445.008645		500	0	0	2	2	0	89%	85	115	0%	
Methane	A	ppm		447.326874		500	0	0	2	2	0	89%	85	115	0%	
Ethylene	X	ppm		445.008645		1000	0	0	2	2	0	45%	0	0	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188891	Cal7	HC-METHANE-	CAL7		1/20/2021 12:31:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		834.11562		1000	0	0	2	2	0	83%	85	115	0%	S
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
14188893	LCS	HC-METHANE-	CCV		1/20/2021 12:36:	1	R355741		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		97.2572953		100	0	0	2	2	0	97%	85	115	0%	
Ethene	A	ppm		97.1407652		100	0	0	2	2	0	97%	85	115	0%	
Methane	A	ppm		96.8898234		100	0	0	2	2	0	97%	85	115	0%	
Ethylene	X	ppm		97.1407652		1000	0	0	2	2	0	10%	85	115	0%	S

Inst ID FID-HeadSpace						
Curve Data for samples analyzed after 1/29/2021						
Blank,cts	STD ID					
	0 #12173	1000000				
Decimal	Sample	Response	Date/Time			
Amnt, Injtd Equivalent	Conc ppm	Area Counts	Factor	Run Id		
300ul						
0.0000025	2.5	4682	1872.8	1/21/2021 11:54	16483	
0.000005	5	8741	1748.2	1/21/2021 12:00	16484	
0.00001	10	16844	1684.4	1/21/2021 12:04	16485	
0.00005	50	79772	1595.44	1/21/2021 12:09	16486	
0.0001	100	151345	1513.45	1/21/2021 12:14	16487	
0.0005	500	714053	1428.106	1/21/2021 12:22	16488	
0.001	1000	1331471	1331.471	1/21/2021 12:31	16489	

Methane	MW= 16.04	StdDev	188.2268
		Avg RF	1596.267
		%RSD	11.79169

Calculated Recoveries			
[PPM]	Area Cnts	PPM	% recovery
2.5	4682	2.933094	1.1732375
5	8741	5.475902	1.0951804
10	16844	10.55212	1.0552121
50	79772	49.9741	0.9994821
100	151345	94.81185	0.9481185
500	714053	447.3269	0.8946537
1000	1331471	834.1156	0.8341156



Sample	Area Count	Dilution	Temperature (°C)	Concentration ppm and mg/L	Date and Time	Analyst	Sample	Test Code	Analyte
MBLK	0	1	20	0	1/20/2021 11:50	jdww	MBLK	HC-METHANE-W	Methane
MBLK	0	1	20	0	1/20/2021 11:50	jdww	MBLK	HC-METHANE-W	Ethane
MBLK	0	1	20	0	1/20/2021 11:50	jdww	MBLK	HC-METHANE-W	Ethene
Cal1	4682	1	20	2.9330938	1/20/2021 11:54	jdww	CCV	HC-METHANE-CCV	Methane
Cal1	8164	1	20	2.66692829	1/20/2021 11:54	jdww	CCV	HC-METHANE-CCV	Ethane
Cal1	8384	1	20	2.68217219	1/20/2021 11:54	jdww	CCV	HC-METHANE-CCV	Ethene
Cal2	8741	1	20	5.47590194	1/20/2021 12:00	jdww	CCV	HC-METHANE-CCV	Methane
Cal2	15792	1	20	5.15876183	1/20/2021 12:00	jdww	CCV	HC-METHANE-CCV	Ethane
Cal2	16206	1	20	5.18455183	1/20/2021 12:00	jdww	CCV	HC-METHANE-CCV	Ethene
Cal3	16844	1	20	10.5521213	1/20/2021 12:04	jdww	CCV	HC-METHANE-CCV	Methane
Cal3	31757	1	20	10.37403746	1/20/2021 12:04	jdww	CCV	HC-METHANE-CCV	Ethane
Cal3	31917	1	20	10.21074545	1/20/2021 12:04	jdww	CCV	HC-METHANE-CCV	Ethene
Cal4	79772	1	20	49.97410476	1/20/2021 12:09	jdww	CCV	HC-METHANE-CCV	Methane
Cal4	154538	1	20	50.48282269	1/20/2021 12:09	jdww	CCV	HC-METHANE-CCV	Ethane
Cal4	158708	1	20	50.7731613	1/20/2021 12:09	jdww	CCV	HC-METHANE-CCV	Ethene
Cal5	151345	1	20	94.81184983	1/20/2021 12:14	jdww	CCV	HC-METHANE-CCV	Methane
Cal5	295835	1	20	96.64021698	1/20/2021 12:14	jdww	CCV	HC-METHANE-CCV	Ethane
Cal5	301225	1	20	96.3665695	1/20/2021 12:14	jdww	CCV	HC-METHANE-CCV	Ethene
Cal6	714053	1	20	447.3268744	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Methane
Cal6	1359194	1	20	444.0069737	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Ethane
Cal6	1391019	1	20	445.0086452	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Ethene
Cal7	1331471	1	20	834.11562	1/20/2021 12:22	jdww	CCV	HC-METHANE-CCV	Methane
LCS	154662	1	20	96.88982337	1/20/2021 12:36	jdww	CCV	HC-METHANE-CCV	Methane
LCS	297724	1	20	97.25729532	1/20/2021 12:36	jdww	CCV	HC-METHANE-CCV	Ethane
LCS	303645	1	20	97.1407652	1/20/2021 12:36	jdww	CCV	HC-METHANE-CCV	Ethene

Calibration
Methane, Ethane,
Ethene
JOW
1/20/2021

*ID MB

* RUN #16482 JAN 20, 2021 11:50:13
START

STOP

RUN# 16482 JAN 20, 2021 11:50:13

IDENTIFIER : MB
NO RUN PERKS STORED

*ID CAL1-2.5PPM

* RUN #16483 JAN 20, 2021 11:54:22
START

1.063
1.834
2.140
STOP

RUN# 16483 JAN 20, 2021 11:54:22

IDENTIFIER : CAL1-2.5PPM
AREA%

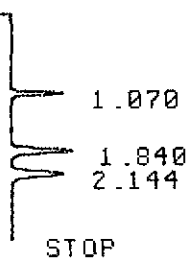
RT	AREA	TYPE	WIDTH	AREA%
1.063	4682	PP	.048	22.05370
1.834	8384	PV	.078	39.49128
2.140	8164	UP	.087	38.45502

TOTAL AREA= 21230
MUL FACTOR=1.0000E+00

*ID CAL2-5PPM

* RUN #16484 JAN 20, 2021 12:00:03

START



RUN# 16484 JAN 20, 2021 12:00:03

IDENTIFIER : CAL2-5PPM

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	8741	UP	.049	21.45610
1.840	16206	PV	.076	39.78006
2.144	15792	UV	.088	38.76384

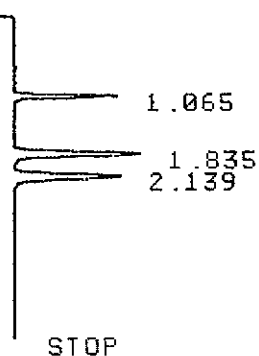
TOTAL AREA= 40739

MUL FACTOR=1.0000E+00

*ID CAL3-10PPM

* RUN #16485 JAN 20, 2021 12:04:08

START



RUN# 16485 JAN 20, 2021 12:04:08

IDENTIFIER : CAL3-10PPM

AREA%

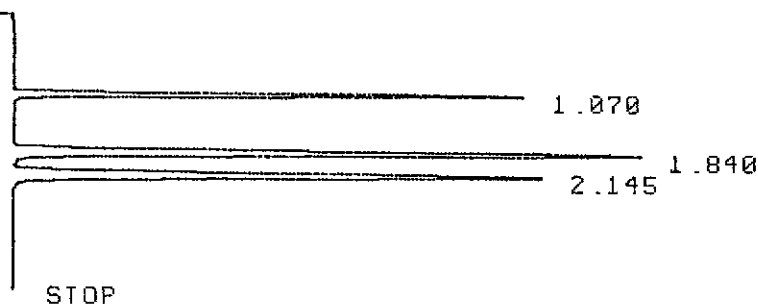
RT	AREA	TYPE	WIDTH	AREA%
1.065	16844	PV	.047	20.91955
1.835	31917	UP	.074	39.63958
2.139	31757	PV	.087	39.44088

TOTAL AREA= 80518

MUL FACTOR=1.0000E+00

*ID CAL4-50PPM

* RUN #16486 JAN 20, 2021 12:09:55
START



RUN# 16486 JAN 20, 2021 12:09:55

IDENTIFIER : CAL4-50PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	79772	PB	.046	20.29729
1.840	158708	PB	.075	40.38187
2.145	154538	BB	.087	39.32085

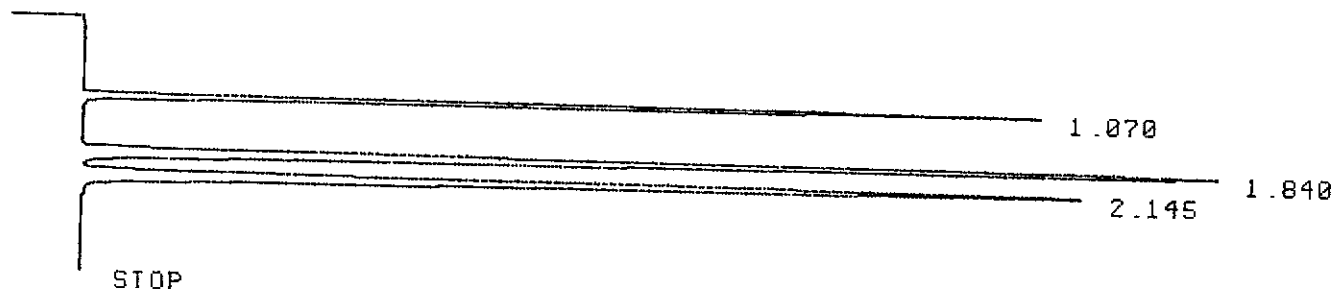
TOTAL AREA= 393018
MUL FACTOR=1.0000E+00

*CAL5-100PPM

INVALID SYSTEM COMMAND

*ID CAL5-100PPM

* RUN #16487 JAN 20, 2021 12:14:46
START



RUN# 16487 JAN 20, 2021 12:14:46

IDENTIFIER : CAL5-100PPM
AREA%

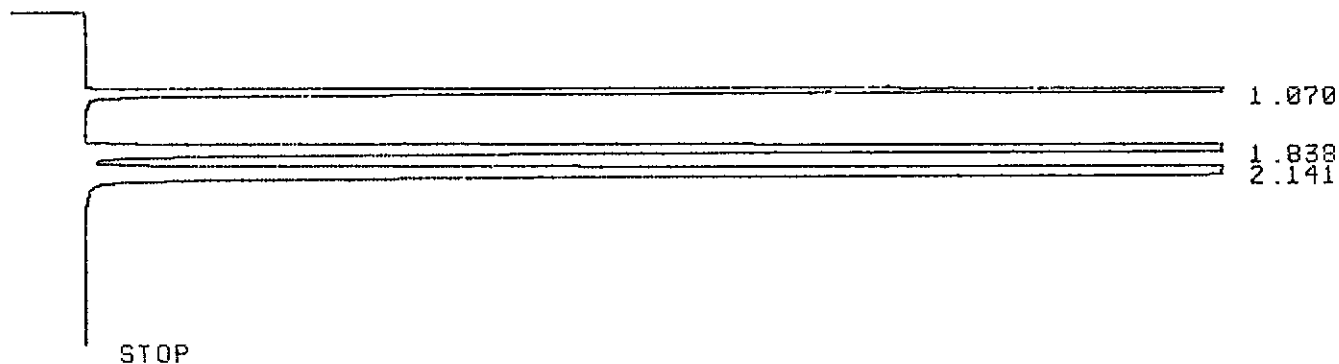
RT	AREA	TYPE	WIDTH	AREA%
1.070	151345	PB	.047	20.22234
1.840	301225	PB	.075	40.24893
2.145	295835	BB	.088	39.52874

TOTAL AREA= 748405

MUL FACTOR=1.0000E+00

*ID CAL6-500PPM

* RUN #16488 JAN 20, 2021 12:22:48
START



STOP

RUN# 16488 JAN 20, 2021 12:22:48

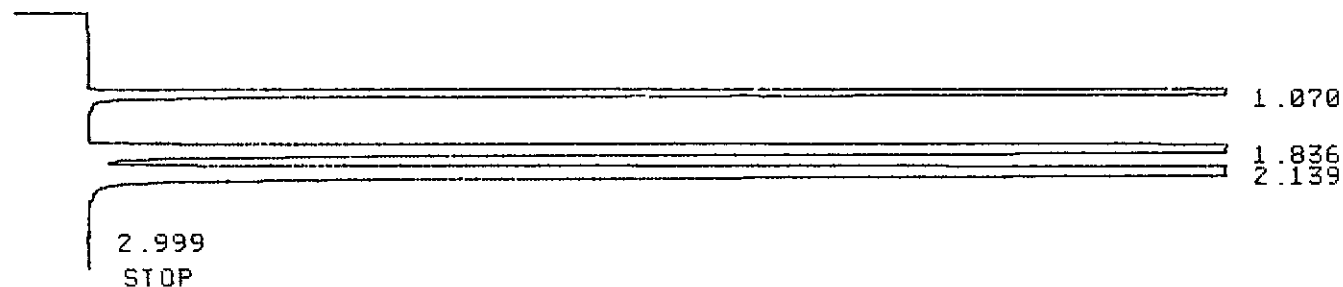
IDENTIFIER : CAL6-500PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	714053	PB	.047	20.61195
1.838	1391019	PB	.077	40.15334
2.141	1359194	BB	.090	39.23469

TOTAL AREA=3464266
MUL FACTOR=1.0000E+00

*ID CAL7-1000PPM

* RUN #16489 JAN 20, 2021 12:31:25
START



STOP

RUN# 16489 JAN 20, 2021 12:31:25

IDENTIFIER : CAL7-1000PPM
AREA%

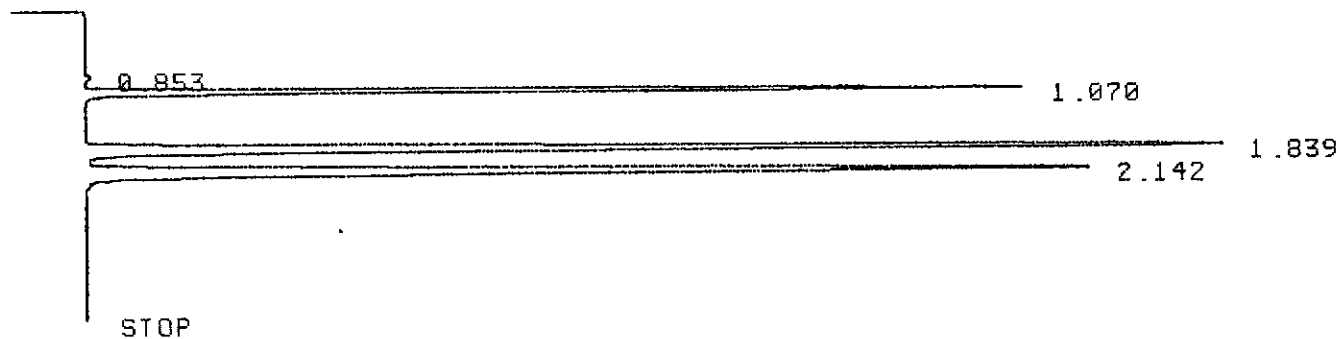
RT	AREA	TYPE	WIDTH	AREA%
1.070	1331471	PB	.049	21.86952

2.139	2333118	UB	.095	37.95542
2.999	795	PP	.068	.01293

TOTAL AREA=6146995
MUL FACTOR=1.0000E+00

*ID 10711-LCS

* RUN #16490 JAN 20, 2021 12:36:18
START



RUN# 16490 JAN 20, 2021 12:36:18

IDENTIFIER : 10711-LCS
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.853	1141	PU	.054	.15069
1.070	154662	BB	.049	20.42627
1.839	303645	BU	.075	40.10251
2.142	297724	UU	.088	39.32053

TOTAL AREA= 757172
MUL FACTOR=1.0000E+00

*

27-Jan-22

Run ID FID-HEADSPACE_220127A

Run Start Date: 1/27/2022

Analyst: Jeff Whitmer

Ical:

Column ID: porapak Q

Comments: See Preservation Comment column for sample pH; thermometer used for temp:S94278.

Instrument ID	Description
1000_SGE_041819	1000 mL SGE Syringe _ Gas Tight

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
10711	HC-Methane-W-CCV	0.3	ml			lcs	8/9/2022
12173	HC-Methane-W-CCV	0.3	ml			CCV	11/23/2023

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
15003267	CCV	HC-METHANE- CCV			1/27/2022 8:27:0	1	R373818		0	0					
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD Q
Methane	A	ppm	99.9181394			100	0	0	2	2	0	100%	85	115	0%
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
15003268	LCS	HC-METHANE- LCS			1/27/2022 8:32:0	1	R373818		0	0					
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD Q
Methane	A	ppm	100.872241			100	0	0	2	2	0	101%	85	115	0%
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
15003269	LCSD	HC-METHANE- LCSD			1/27/2022 8:36:0	1	R373818		0	2E+07					
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD Q
Methane	A	ppm	97.9698434			100	0	100.87224	2	2	0	98%	85	115	3%

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist						
15003270	MBLK	HC-METHANE-	MBLK		1/27/2022 9:36:0	1	R373818		0	0							
Analyte		T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane		A	mg/L		0			0	0	0.000704	0.001	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist						
15003271	B22011592-001I	HC-METHANE-	SAMP		1/27/2022 9:41:0	1	R373818		0	0							
Analyte		T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane		A	mg/L		0.00236121			0	0	0.000704	0.002	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist						
15003272	B22011592-001I	HC-METHANE-	DUP		1/27/2022 9:46:0	1	R373818		0	2E+07							
Analyte		T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane		A	mg/L		0.00243105			0	0.0023612	0.000704	0.002	0	0%	0	0	3%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist						
15003273	B22011592-005	HC-METHANE-	SAMP		1/27/2022 9:51:0	1	R373818		0	0							
Analyte		T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane		A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist						
15003274	B22011592-006I	HC-METHANE-	SAMP		1/27/2022 10:13:	79	R373818		0	0							
Analyte		T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane		A	mg/L		0.57937750			0	0	0.055616	0.158	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist						
15003275	B22011592-011	HC-METHANE-	SAMP		1/27/2022 10:26:	1	R373818		0	0							
Analyte		T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane		A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003276	B22011592-012I	HC-METHANE-	SAMP		1/27/2022 10:32:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003277	B22011592-016	HC-METHANE-	SAMP		1/27/2022 10:37:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003278	B22011592-022I	HC-METHANE-	SAMP		1/27/2022 10:42:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003279	B22011592-026	HC-METHANE-	SAMP		1/27/2022 10:51:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003280	B22011592-027I	HC-METHANE-	SAMP		1/27/2022 11:08:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.0066819			0	0	0.000704	0.002	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003281	B22011592-031	HC-METHANE-	SAMP		1/27/2022 11:19:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U

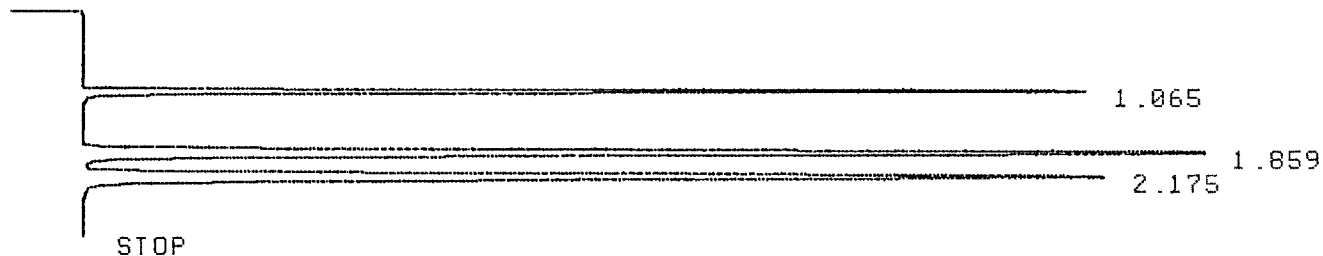
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003282	B22011592-017I	HC-METHANE-	SAMP		1/27/2022 11:25:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.0062953			0	0	0.000704	0.002	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003283	B22011592-021	HC-METHANE-	SAMP		1/27/2022 11:36:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15003284	CCV	HC-METHANE-	CCV		1/27/2022 11:41:	1	R373818		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		99.1369416		100	0	0	2	2	0	99%	85	115	0%	

Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	159496	1	20	99.91813935	1/27/2022 8:27	jdww	CCV	HC-METHANE-CCV	Methane		
LCS	161019	1	20	100.8722406	1/27/2022 8:32	jdww	LCS	HC-METHANE-CCV	Methane		
LCSD	156386	1	20	97.96984339	1/27/2022 8:36	jdww	LCSD	HC-METHANE-CCV	Methane		
MBLK	948	1	20	0.000137936	1/27/2022 9:36	jdww	MBLK	HC-METHANE-W	Methane	10	32
B22011592-001I	17176	1	20	0.00236121	1/27/2022 9:41	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-001IDUP	17656	1	20	0.002431051	1/27/2022 9:46	jdww	DUP	HC-METHANE-W	Methane	10	32
B22011592-005A	901	1	20	-6.8386E-06	1/27/2022 9:51	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-006I	51352	79	20	0.579377504	1/27/2022 10:13	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-011A	821	1	20	-1.84788E-05	1/27/2022 10:26	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-012I	809	1	20	-2.02248E-05	1/27/2022 10:32	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-016A	1906	1	20	0.000139391	1/27/2022 10:37	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-017I	44214	1	20	0.006295298	1/27/2022 11:25	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-021A	1318	1	20	5.38358E-05	1/27/2022 11:36	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-022I	3051	1	20	0.000305991	1/27/2022 10:42	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-026A	809	1	20	-2.02248E-05	1/27/2022 10:51	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-027I	46871	1	20	0.006681897	1/27/2022 11:08	jdww	SAMP	HC-METHANE-W	Methane	10	32
B22011592-031A	966	1	20	2.61904E-06	1/27/2022 11:19	jdww	SAMP	HC-METHANE-W	Methane	10	32
CCV	158249	1	20	99.13694158	1/27/2022 11:41	jdww	CCV	HC-METHANE-CCV	Methane		

*ID 12173-500X-CCU

JDW
1/27/2022

* RUN #19207 JAN 27, 2022 08:27:29
START



RUN# 19207 JAN 27, 2022 08:27:29

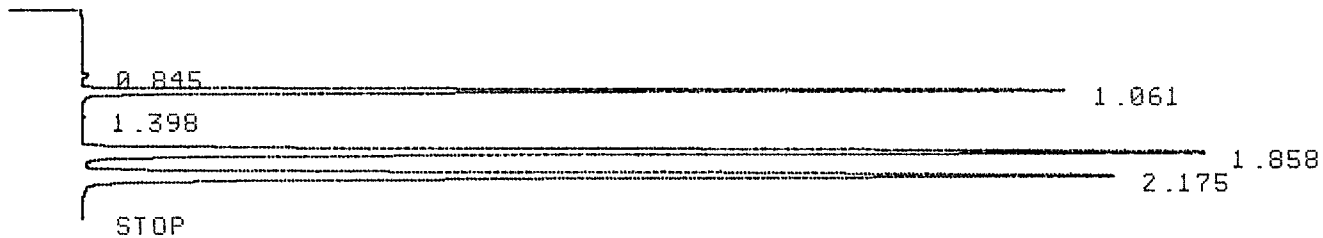
IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	159496	PB	.046	20.17673
1.859	318087	PB	.077	40.23896
2.175	312912	BB	.090	39.58430

TOTAL AREA= 790495
MUL FACTOR=1.0000E+00

*ID 10711-LCS

* RUN #19208 JAN 27, 2022 08:32:04
START



RUN# 19208 JAN 27, 2022 08:32:04

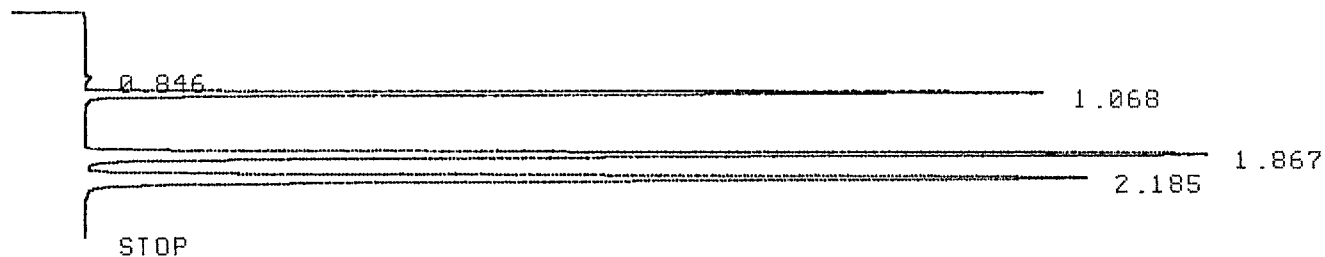
IDENTIFIER : 10711-LCS
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.845	974	BU	.045	.12225
1.061	161019	PB	.048	20.20975
1.858	320881	PV	.076	40.27429
2.175	313865	UB	.089	39.39371

TOTAL AREA= 796739
MUL FACTOR=1.0000E+00

*ID 10711-LCSD

* RUN #19209 JAN 27, 2022 08:36:19
START



RUN# 19209 JAN 27, 2022 08:36:19

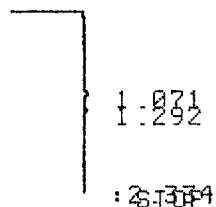
IDENTIFIER : 10711-LCSD
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.846	1288	PP	.054	.16589
1.068	156386	PB	.048	20.14181
1.867	312308	PB	.076	40.22384
2.185	306443	BB	.090	39.46846

TOTAL AREA= 776425
MUL FACTOR=1.0000E+00

*ID MB

* RUN #19210 JAN 27, 2022 09:36:25
START



RUN# 19210 JAN 27, 2022 09:36:25

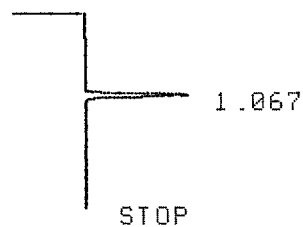
IDENTIFIER : MB
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	948	PV	.059	74.88154
1.292	318	UP	.017	25.11849

TOTAL AREA= 1266
MUL FACTOR=1.0000E+00

*ID 1592-1I

* RUN #19211 JAN 27, 2022 09:41:12
START



RUN# 19211 JAN 27, 2022 09:41:12

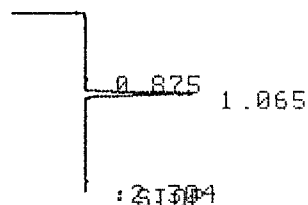
IDENTIFIER : 1592-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.067	17176	PV	.048	100.00000

TOTAL AREA= 17176
MUL FACTOR=1.0000E+00

*ID 1592-1I-DUP

* RUN #19212 JAN 27, 2022 09:46:30
START



RUN# 19212 JAN 27, 2022 09:46:30

IDENTIFIER : 1592-1I-DUP
AREA%

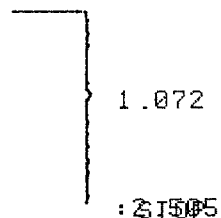
RT	AREA	TYPE	WIDTH	AREA%
.875	661	UV	.055	3.60867
1.065	17656	PV	.047	96.39133

TOTAL AREA= 18317
MUL FACTOR=1.0000E+00

*

*ID 1592-5A

* RUN #19213 JAN 27, 2022 09:51:46
START



RUN# 19213 JAN 27, 2022 09:51:46

IDENTIFIER : 1592-5A

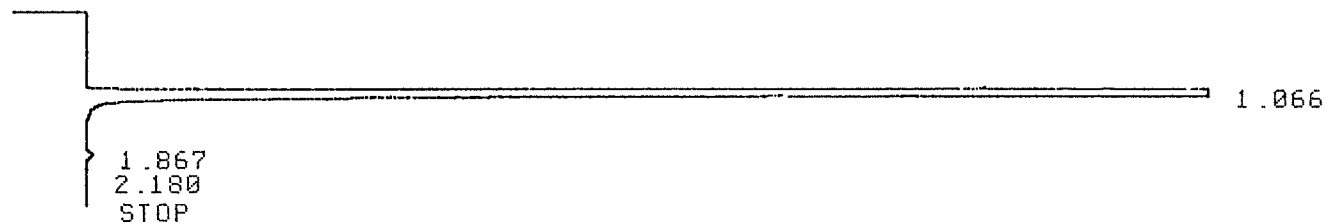
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.072	901	BU	.055	100.00000

TOTAL AREA= 901
MUL FACTOR=1.0000E+00

*ID 1592-6I

* RUN #19214 JAN 27, 2022 09:56:45
START



RUN# 19214 JAN 27, 2022 09:56:45

IDENTIFIER : 1592-6I

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.066	2945712	PB	.055	99.87722
1.867	2727	PV	.095	.09246
2.180	894	PV	.103	.03031

TOTAL AREA=2949333
MUL FACTOR=1.0000E+00

STOP

*ID 1592-6I-78X

79 SDW 1/27/2022

* RUN #19215 JAN 27, 2022 10:13:28
START



RUN# 19215 JAN 27, 2022 10:13:28

IDENTIFIER : 1592-6I-78X
AREA%

79 SDW 1/27/2022

RT	AREA	TYPE	WIDTH	AREA%
1.066	51352	BP	.046	100.00000

TOTAL AREA= 51352
MUL FACTOR=1.0000E+00

* PLOT

STOP

* PLOT

STOP

*

*ID 1592-11A

* RUN #19216 JAN 27, 2022 10:26:48
START

┌───
│
└─── 1.074
│
└─── 2.406
STOP

RUN# 19216 JAN 27, 2022 10:26:48

IDENTIFIER : 1592-11A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.074	821	BP	.052	100.00000

TOTAL AREA= 821
MUL FACTOR=1.0000E+00

*ID 1592-12I

* RUN #19217 JAN 27, 2022 10:32:07
START

┌───
│
└─── 1.061
│
└─── STOP

RUN# 19217 JAN 27, 2022 10:32:07

IDENTIFIER : 1592-12I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.061	809	PP	.058	100.00000

TOTAL AREA= 809
MUL FACTOR=1.0000E+00

*ID 1592-16A

* RUN #19218 JAN 27, 2022 10:37:57
START

┌
└ 0.878
 1.067
└
 2.230
 STOP

RUN# 19218 JAN 27, 2022 10:37:57

IDENTIFIER : 1592-16A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.878	611	PV	.051	24.27494
1.067	1906	UU	.065	75.72506

TOTAL AREA= 2517
MUL FACTOR=1.0000E+00

*ID 1592-22I

* RUN #19219 JAN 27, 2022 10:42:38
START

┌
└ 0.239
 1.070
└
 2.342
 STOP

RUN# 19219 JAN 27, 2022 10:42:38

IDENTIFIER : 1592-22I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.239	321	PV	.043	9.51957
1.070	3051	BP	.048	90.48045

TOTAL AREA= 3372
MUL FACTOR=1.0000E+00

*ID 1592-26A

* RUN #19220 JAN 27, 2022 10:51:51
START



RUN# 19220 JAN 27, 2022 10:51:51

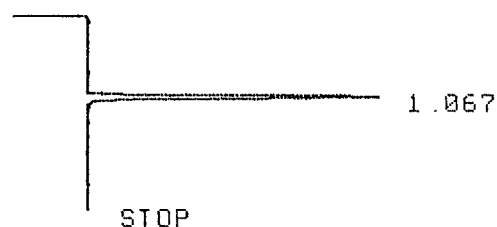
IDENTIFIER : 1592-26A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	809	UP	.048	100.00000

TOTAL AREA= 809
MUL FACTOR=1.0000E+00

*ID 1592-27I

* RUN #19221 JAN 27, 2022 11:08:48
START



RUN# 19221 JAN 27, 2022 11:08:48

IDENTIFIER : 1592-27I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.067	46871	PV	.047	100.00000

TOTAL AREA= 46871
MUL FACTOR=1.0000E+00

* PLOT

STOP

* PLOT

STOP

*ID 1592-1

*ID 1592-31A

* RUN #19222 JAN 27, 2022 11:19:22
START

0.854
1.071

:2.1520

RUN# 19222 JAN 27, 2022 11:19:22

IDENTIFIER : 1592-31A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
.854	921	PV	.127	48.80763
1.071	966	UU	.057	51.19235

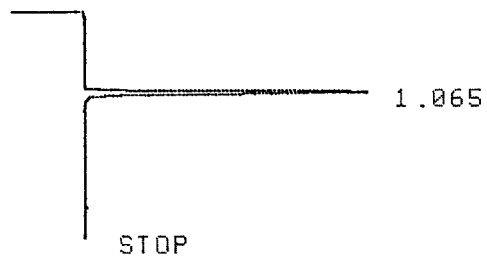
TOTAL AREA= 1887

MUL FACTOR=1.0000E+00

*

*ID 1592-17I

* RUN #19223 JAN 27, 2022 11:25:55
START



RUN# 19223 JAN 27, 2022 11:25:55

IDENTIFIER : 1592-17I

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	44214	PB	.045	100.00000

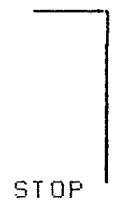
TOTAL AREA= 44214

MUL FACTOR=1.0000E+00

* PLOT



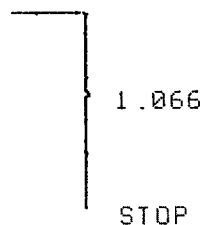
* PLOT



*

*ID 1592-21A

* RUN #19224 JAN 27, 2022 11:36:21
START



RUN# 19224 JAN 27, 2022 11:36:21

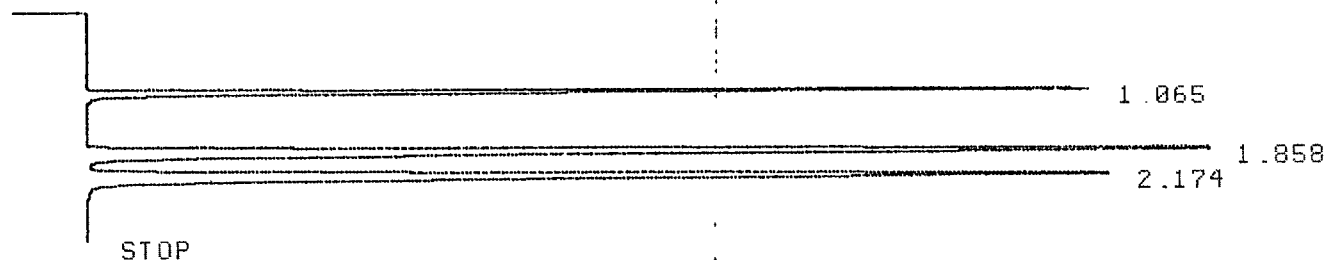
IDENTIFIER : 1592-21A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.066	1318	PP	.076	100.00000

TOTAL AREA= 1318
MUL FACTOR=1.0000E+00

*ID 12173-500X-CCU

* RUN #19225 JAN 27, 2022 11:41:56
START



RUN# 19225 JAN 27, 2022 11:41:56

IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	158249	PB	.046	20.20634
1.858	316545	UB	.076	40.41869
2.174	308371	BB	.089	39.37498

TOTAL AREA= 783165
MUL FACTOR=1.0000E+00

Energy Laboratories Inc

Spike LOG

Standard ID: 12173
Standard Name HC-Methane-W-CCV Type: Primary
Date Prepared 11/22/2019 BY:
Date Expires: 11/23/2023
Department GAS Status: New
Vendor: Matheson
Lot Number: 109-96-04454
Balance ID:

Comments: CCV Gas Standard for Methane, Ethene, Ethane: 50000ppm stock diluted from 100 - 500ppm with Helium for CCV.
Diluted from 2.5ppm - 1000ppm with Helium for Calibration.

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
3 Multi-Component Gas Standard in Ni	12173		mL	11/23

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL

MATHESON TRI-GAS INC
1650 Enterprise Pkwy
Twinsburg, OH 44087
1-215-648-4000

CERTIFICATE OF ANALYSIS

Energy Laboratories Inc
1120 South 27th Street
Billings, MT 59101

Ref Po# 3008099

14 LITER DISPOSABLE

LOT NUMBER: 109-96-04454

COMPONENT

methane
ethane
ethylene
nitrogen

CONCENTRATION

50010 ppm
50030 ppm
50030 ppm
Bal

ITEM NUMBER: GMT2685284TC

CGA: 160

PSIG: 240

FILL DATE: 11/22/19

EXPIRATION DATE: 11/23/23

ID #: 12173

Opened: _____

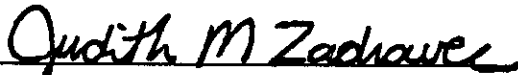
3 Multi-Component Gas Standard in Nitrogen

Expires: 11/23/2023

Rec'd: 12/3/2019

Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107

Above are the results of the analysis you requested, as reported by our laboratory. Results are in mole percent, unless otherwise indicated. Mixture accuracy is $\pm 2\%$. NIST traceable by weights or gaseous standards.



Judy Zadravec, Chemist

10/19/2018

DATE

Energy Laboratories Inc

Spike LOG

Standard ID: 10711
Standard Name HC-Methane-W-CCV
Date Prepared 8/8/2018
Date Expires: 8/9/2022
Department GAS
Vendor: Matheson
Lot Number: 109-86-03507
Balance ID:

Type: Primary
BY:
Status: New

Comments: LCS Gas Standard for Methane, Ethene, Ethane: 100ppm per standard used undiluted for LCS

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
3 Multi-Component Gas Standard in Ni	10711		mL	8/9/22

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL

MATHESON TRI-GAS INC
1650 Enterprise Pkwy
Twinsburg, OH 44087
1-215-648-4000

CERTIFICATE OF ANALYSIS

Energy Laboratories Inc
1120 South 27th Street
Billings, MT 59101

Ref Po# 3005062

14 LITER DISPOSABLE

LOT NUMBER: 109-86-03507

COMPONENT

CONCENTRATION

methane	100.0	ppm
ethane	100.0	ppm
ethylene	100.0	ppm
nitrogen	Bal	

ITEM NUMBER: GMT2677328TC

CGA: 160

PSIG: 240

FILL DATE: 08/08/18

EXPIRATION DATE: 08/09/22

Above are the results of the analysis you requested, as reported by our laboratory. Results are in mole percent, unless otherwise indicated. Mixture accuracy is $\pm 2\%$. NIST traceable by weights or gaseous standards.

Judith M Zadravec

Judy Zadravec, Chemist

8/14/2018

DATE

ID #: 10711
Opened: _____
3 Multi-Component Gas Standard in Nitrogen
Expires: 8/9/2022
Rec'd: 8/27/2018
Energy Laboratories Inc 1120 So. 27th Street
Billings MT 59107