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

1

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

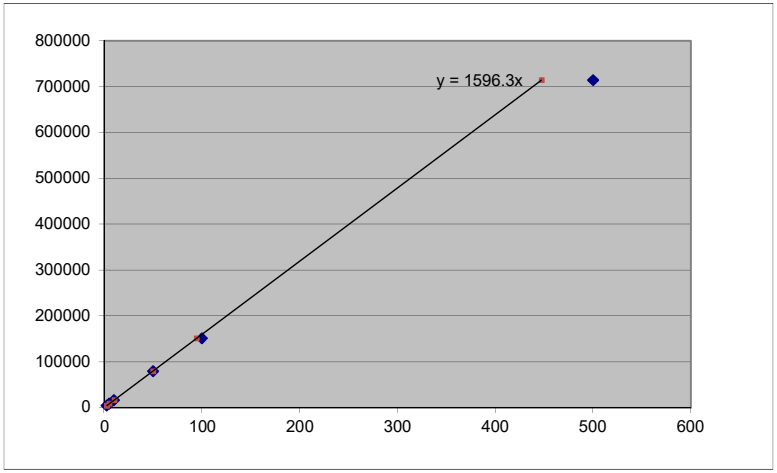
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14188893	LCS	HC-METHANE- CCV			1/20/2021 12:36:	1	R355741		0	0	

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

Blank,cts	STD ID	Curve Data for samples analyzed after 1/29/2021
0	#12173	1000000

Amnt, Injtd 300ul	Decimal Equivalent	Conc ppm	Sample Area Counts	Response Factor	Date/Time	Run Id
	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



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

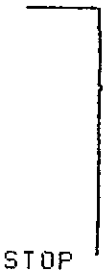
		Calculated Recoveries	
[PPM]	Area Cnts	PPM	% recovery
2.5	4682	2.933094	1.1732375
5	8741	5.475902	1.0951804
10	16844	10.55212	1.0552121
50	79772	49.9741	0.9994821
100	151345	94.81185	0.9481185
500	714053	447.3269	0.8946537
1000	1331471	834.1156	0.8341156

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	jdw	MBLK	HC-METHANE-W	Methane
MBLK	0	1	20	0	1/20/2021 11:50	jdw	MBLK	HC-METHANE-W	Ethane
MBLK	0	1	20	0	1/20/2021 11:50	jdw	MBLK	HC-METHANE-W	Ethene
Cal1	4682	1	20	2.9330938	1/20/2021 11:54	jdw	CCV	HC-METHANE-CCV	Methane
Cal1	8164	1	20	2.66692829	1/20/2021 11:54	jdw	CCV	HC-METHANE-CCV	Ethane
Cal1	8384	1	20	2.68217219	1/20/2021 11:54	jdw	CCV	HC-METHANE-CCV	Ethene
Cal2	8741	1	20	5.47590194	1/20/2021 12:00	jdw	CCV	HC-METHANE-CCV	Methane
Cal2	15792	1	20	5.15876183	1/20/2021 12:00	jdw	CCV	HC-METHANE-CCV	Ethane
Cal2	16206	1	20	5.18455183	1/20/2021 12:00	jdw	CCV	HC-METHANE-CCV	Ethene
Cal3	16844	1	20	10.5521213	1/20/2021 12:04	jdw	CCV	HC-METHANE-CCV	Methane
Cal3	31757	1	20	10.37403746	1/20/2021 12:04	jdw	CCV	HC-METHANE-CCV	Ethane
Cal3	31917	1	20	10.21074545	1/20/2021 12:04	jdw	CCV	HC-METHANE-CCV	Ethene
Cal4	79772	1	20	49.97410476	1/20/2021 12:09	jdw	CCV	HC-METHANE-CCV	Methane
Cal4	154538	1	20	50.48282269	1/20/2021 12:09	jdw	CCV	HC-METHANE-CCV	Ethane
Cal4	158708	1	20	50.7731613	1/20/2021 12:09	jdw	CCV	HC-METHANE-CCV	Ethene
Cal5	151345	1	20	94.81184983	1/20/2021 12:14	jdw	CCV	HC-METHANE-CCV	Methane
Cal5	295835	1	20	96.64021698	1/20/2021 12:14	jdw	CCV	HC-METHANE-CCV	Ethane
Cal5	301225	1	20	96.3665695	1/20/2021 12:14	jdw	CCV	HC-METHANE-CCV	Ethene
Cal6	714053	1	20	447.3268744	1/20/2021 12:22	jdw	CCV	HC-METHANE-CCV	Methane
Cal6	1359194	1	20	444.0069737	1/20/2021 12:22	jdw	CCV	HC-METHANE-CCV	Ethane
Cal6	1391019	1	20	445.0086452	1/20/2021 12:22	jdw	CCV	HC-METHANE-CCV	Ethene
Cal7	1331471	1	20	834.11562	1/20/2021 12:22	jdw	CCV	HC-METHANE-CCV	Methane
LCS	154662	1	20	96.88982337	1/20/2021 12:36	jdw	CCV	HC-METHANE-CCV	Methane
LCS	297724	1	20	97.25729532	1/20/2021 12:36	jdw	CCV	HC-METHANE-CCV	Ethane
LCS	303645	1	20	97.1407652	1/20/2021 12:36	jdw	CCV	HC-METHANE-CCV	Ethene

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

*ID MB

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



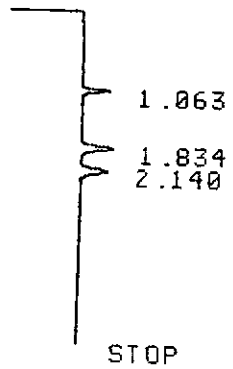
STOP

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

IDENTIFIER : MB
NO RUN PEAKS STORED

*ID CAL1-2.5PPM

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



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

IDENTIFIER : CAL1-2.5PPM
AREA%

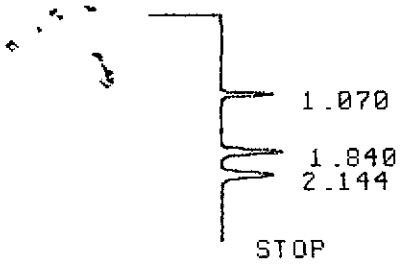
RT	AREA	TYPE	WIDTH	AREA%
1.063	4682	PP	.048	22.05370
1.834	8384	PU	.078	39.49128
2.140	8164	UP	.087	38.45502

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	VP	.049	21.45610
1.840	16206	PV	.076	39.78006
2.144	15792	VV	.088	38.76384

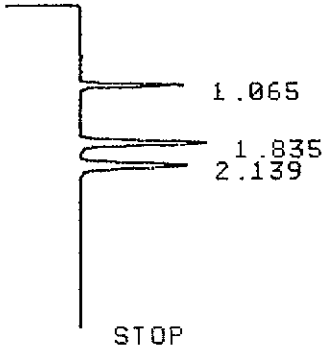
TOTAL AREA= 40739

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%

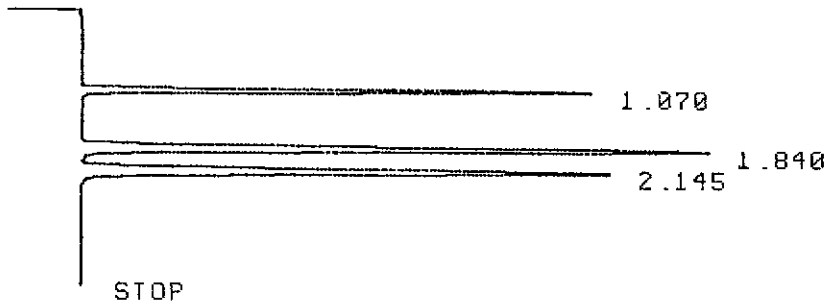
RT	AREA	TYPE	WIDTH	AREA%
1.065	16844	PV	.047	20.91955
1.835	31917	VP	.074	39.63958
2.139	31757	PV	.087	39.44088

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

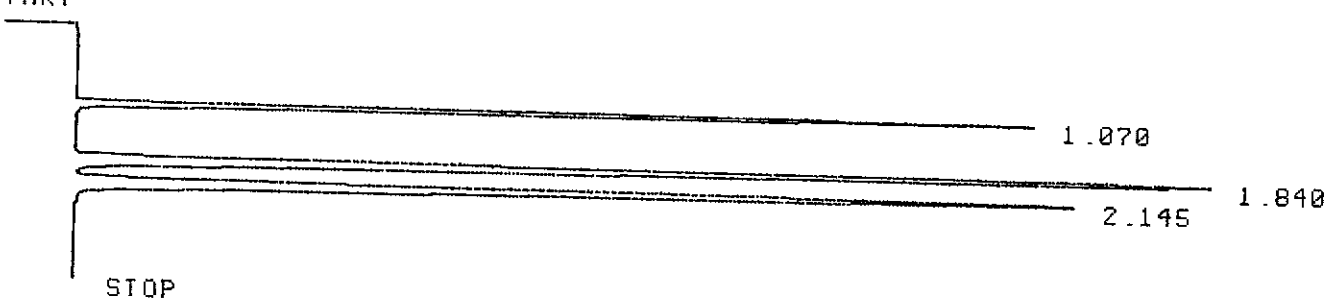
TOTAL AREA= 393018
MUL FACTOR=1.0000E+00

*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

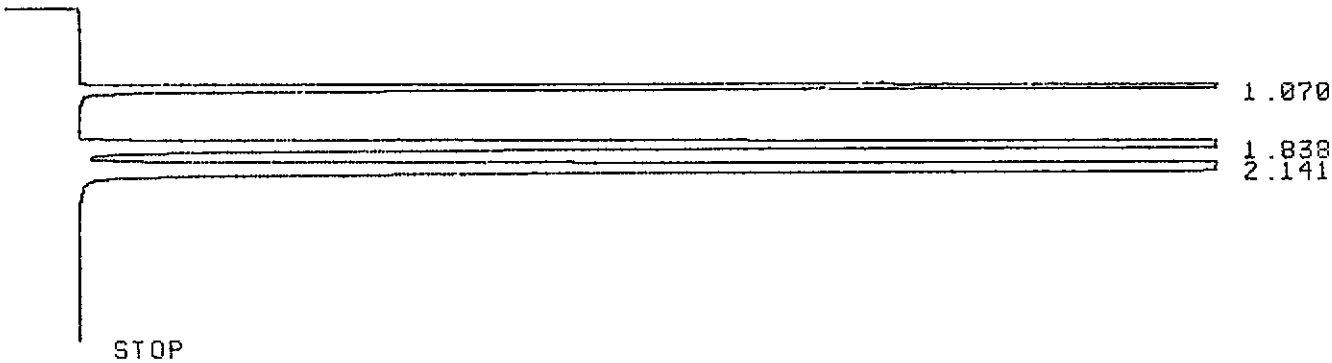
IDENTIFIER : CAL5-100PPM
AREA%

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



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

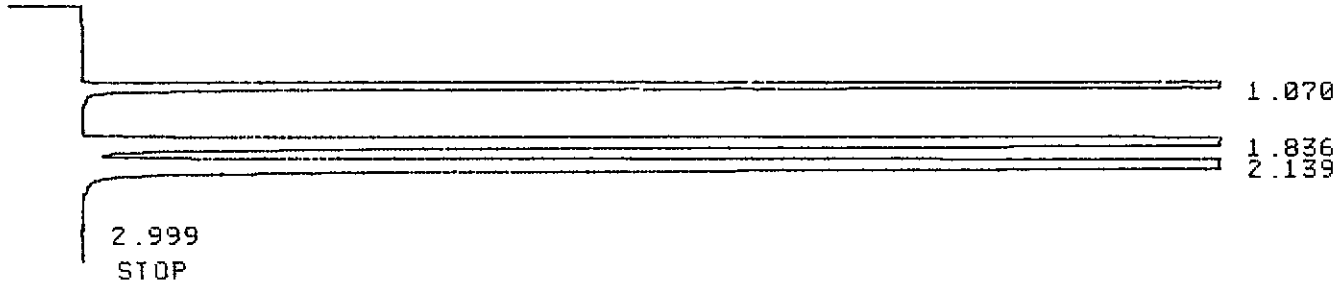
IDENTIFIER : CAL6-500PPM
AREA%

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



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

IDENTIFIER : CAL7-1000PPM
AREA%

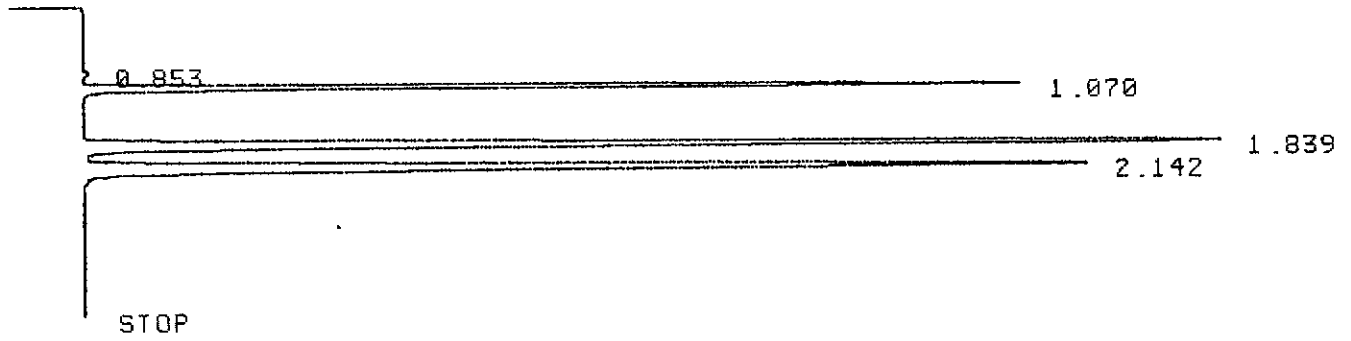
RT	AREA	TYPE	WIDTH	AREA%
1.070	1331471	PB	.049	21.66052

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

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Energy Laboratories Inc

ANALYTICAL RUN Summary

26-Jan-22

Run ID FID-HEADSPACE_220125A

Run Start Date: 1/25/2022
Analyst: Jeff Whitmer
Ical:
Column ID: porapak Q
Comments:

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
15000428	CCV	HC-METHANE-	CCV		1/25/2022 8:53:0	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		96.7137876		100	0	0	2	2	0	97%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
15000429	LCS	HC-METHANE-	LCS		1/25/2022 8:58:0	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		100.800824		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
15000430	LCSD	HC-METHANE-	LCSD		1/25/2022 9:02:0	1	R373752		0	2E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		99.5341183		100	0	100.80082	2	2	0	100%	85	115	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
15000431	MBLK	HC-METHANE-	MBLK		1/25/2022 10:22:	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

1

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
15000431	MBLK	HC-METHANE-	MBLK		1/25/2022 10:22:	1	R373752		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
15000432	B22011446-001I	HC-METHANE-	SAMP		1/25/2022 10:28:	1	R373752		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
15000433	B22011446-005	HC-METHANE-	SAMP		1/25/2022 10:33:	1	R373752		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
15000434	B22011446-006I	HC-METHANE-	SAMP		1/25/2022 10:39:	1	R373752		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
15000435	B22011446-010	HC-METHANE-	SAMP		1/25/2022 10:45:	1	R373752		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
15000436	B22011446-011I	HC-METHANE-	SAMP		1/25/2022 10:50:	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00199673			0	0	0.000704	0.002	0	0%	0	0	0%	J

2

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
15000437	B22011446-011I	HC-METHANE-	DUP		1/25/2022 10:57:	1	R373752		0	2E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00200269			0	0.0019967	0.000704	0.002	0	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
15000438	B22011446-016	HC-METHANE-	SAMP		1/25/2022 11:04:	1	R373752		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
15000439	B22011446-017I	HC-METHANE-	SAMP		1/25/2022 11:10:	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00153578			0	0	0.000704	0.002	0	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
15000440	B22011446-021	HC-METHANE-	SAMP		1/25/2022 11:16:	1	R373752		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
15000441	B22011446-022I	HC-METHANE-	SAMP		1/25/2022 11:21:	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00552108			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
15000442	B22011446-022I	HC-METHANE-	DUP		1/25/2022 11:27:	1	R373752		0	2E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00567226			0	0.0055211	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
15000443	B22011446-026	HC-METHANE-	SAMP		1/25/2022 11:34:	1	R373752		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
15000444	B22011446-027I	HC-METHANE-	SAMP		1/25/2022 11:48:	1	R373752		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
15000445	B22011446-031	HC-METHANE-	SAMP		1/25/2022 11:54:	1	R373752		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
15000446	B22011446-032I	HC-METHANE-	SAMP		1/25/2022 11:59:	1	R373752		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00232643			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
15000447	B22011446-036	HC-METHANE-	SAMP		1/25/2022 12:10:	1	R373752		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
15000448	CCV	HC-METHANE-	CCV		1/25/2022 12:15:	1	R373752		0	0	

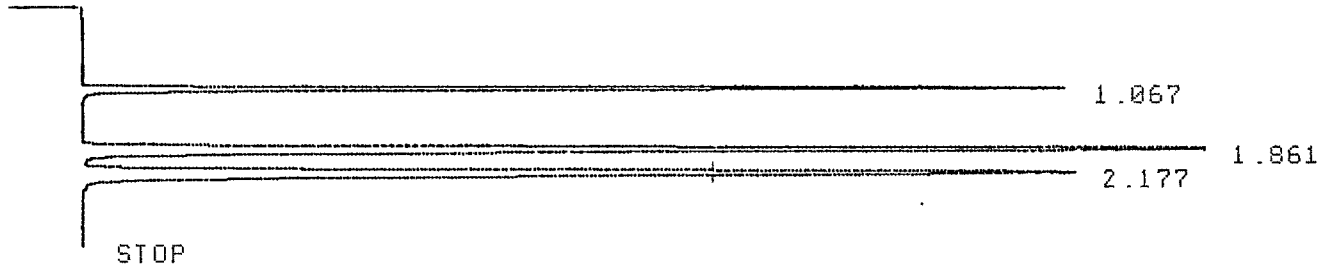
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		96.9029791		100	0	0	2	2	0	97%	85	115	0%	

Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	154381	1	20	96.71378763	1/25/2022 8:53	jdw	CCV	HC-METHANE-CCV	Methane		
LCS	160905	1	20	100.8008239	1/25/2022 8:58	jdw	LCS	HC-METHANE-CCV	Methane		
LCSD	158883	1	20	99.53411831	1/25/2022 9:02	jdw	LCSD	HC-METHANE-CCV	Methane		
MBLK	890	1	20	0.000129497	1/25/2022 10:22	jdw	MBLK	HC-METHANE-W	Methane	10	32
B22011446-001I	1264	1	20	5.44178E-05	1/25/2022 10:28	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-005A	1302	1	20	5.99469E-05	1/25/2022 10:33	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-006I	3624	1	20	0.000397803	1/25/2022 10:39	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-010A	1169	1	20	4.05951E-05	1/25/2022 10:45	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-011I	14613	1	20	0.001996727	1/25/2022 10:50	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-011IDUP	14654	1	20	0.002002692	1/25/2022 10:57	jdw	DUP	HC-METHANE-W	Methane	10	32
B22011446-016A	933	1	20	6.25659E-06	1/25/2022 11:04	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-017I	11445	1	20	0.001535776	1/25/2022 11:10	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-021A	1073	1	20	2.66269E-05	1/25/2022 11:16	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-022I	38835	1	20	0.005521081	1/25/2022 11:21	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-022IDUP	39874	1	20	0.005672257	1/25/2022 11:27	jdw	DUP	HC-METHANE-W	Methane	10	32
B22011446-026A	1151	1	20	3.79761E-05	1/25/2022 11:34	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-027I	580	1	20	-4.51057E-05	1/25/2022 11:48	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-031A	1038	1	20	2.15343E-05	1/25/2022 11:54	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-032I	16879	1	20	0.002326435	1/25/2022 11:59	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22011446-036A	1285	1	20	5.74734E-05	1/25/2022 12:10	jdw	SAMP	HC-METHANE-W	Methane	10	32
CCV	154683	1	20	96.90297907	1/25/2022 12:15	jdw	CCV	HC-METHANE-CCV	Methane		

JDW
1/25/2022

*ID 12173-500X-CCV

* RUN #19175   JAN 25, 2022 08:53:13
START



RUN# 19175   JAN 25, 2022 08:53:13

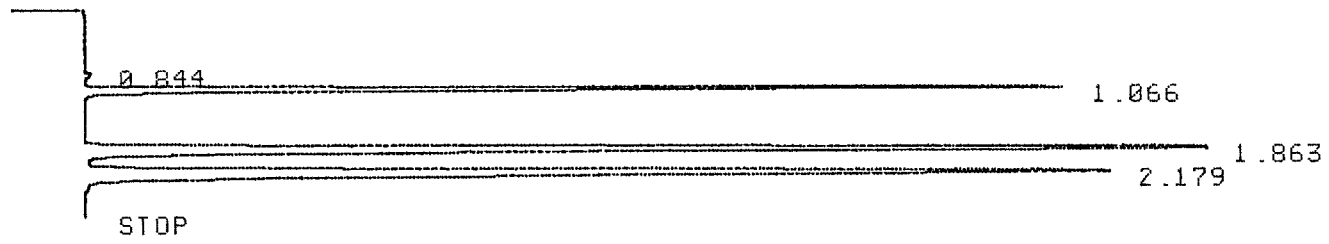
IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.067	154381	PB	.046	20.14939
1.861	308833	PU	.076	40.30805
2.177	302968	VB	.089	39.54256

TOTAL AREA= 766182
MUL FACTOR=1.0000E+00

*ID 10711-LCS

* RUN #19176   JAN 25, 2022 08:58:08
START



RUN# 19176   JAN 25, 2022 08:58:08

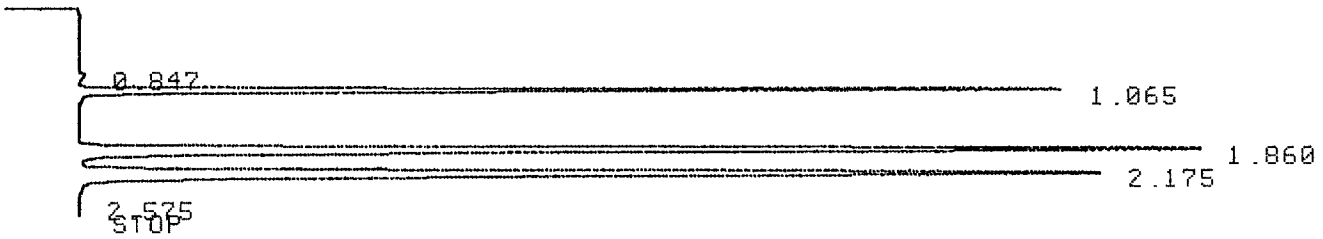
IDENTIFIER : 10711-LCS
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.844	1335	PU	.057	.16893
1.066	160905	PB	.048	20.36084
1.863	318760	PB	.076	40.33574
2.179	309267	BP	.088	39.13450

TOTAL AREA= 790267
MUL FACTOR=1.0000E+00

*ID 10711-LCSD

* RUN #19177   JAN 25, 2022 09:02:17
START



RUN# 19177   JAN 25, 2022 09:02:17

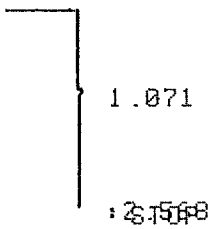
IDENTIFIER : 10711-LCSD
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.847	1116	VP	.052	.14179
1.065	158883	PB	.047	20.18602
1.860	316241	PB	.076	40.17830
2.175	310082	BV	.089	39.39579
2.575	772	PP	.096	.09808

TOTAL AREA= 787094
MUL FACTOR=1.0000E+00

*ID MB

* RUN #19178   JAN 25, 2022 10:22:22
START



RUN# 19178   JAN 25, 2022 10:22:22

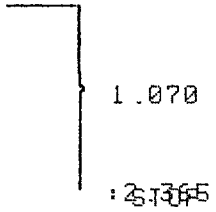
IDENTIFIER : MB
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	890	PU	.063	100.00000

TOTAL AREA=   890
MUL FACTOR=1.0000E+00

*ID 1446-1I

* RUN #19179   JAN 25, 2022 10:28:16
START



RUN# 19179   JAN 25, 2022 10:28:16

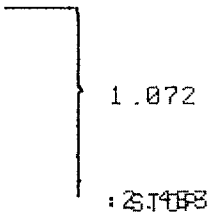
IDENTIFIER : 1446-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	1264	PU	.064	100.00000

TOTAL AREA=   1264
MUL FACTOR=1.0000E+00

*ID 1446-5A

* RUN #19180   JAN 25, 2022 10:33:59
START



RUN# 19180   JAN 25, 2022 10:33:59

IDENTIFIER : 1446-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.072	1302	PU	.071	100.00000

TOTAL AREA=   1302
MUL FACTOR=1.0000E+00

*

*ID 1446-6I

* RUN #19181   JAN 25, 2022 10:39:39
START

RUN# 19181   JAN 25, 2022 10:39:39

IDENTIFIER : 1446-6I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.067	3624	PU	.052	85.49184
1.390	615	PP	.083	14.50814

TOTAL AREA=   4239
MUL FACTOR=1.0000E+00

*ID 1446-10A

* RUN #19182   JAN 25, 2022 10:45:45
START

RUN# 19182   JAN 25, 2022 10:45:45

IDENTIFIER : 1446-10A
AREA%

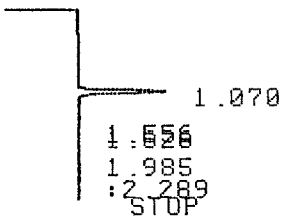
RT	AREA	TYPE	WIDTH	AREA%
1.070	1169	PP	.071	100.00000

TOTAL AREA=   1169
MUL FACTOR=1.0000E+00

*

*ID 1446-11I

* RUN #19183   JAN 25, 2022 10:50:53
START



RUN# 19183   JAN 25, 2022 10:50:53

IDENTIFIER : 1446-11I
AREA%

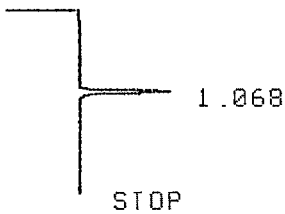
RT	AREA	TYPE	WIDTH	AREA%
1.070	14613	VV	.048	92.05619
1.556	388	PV	.041	2.44425
1.626	398	VV	.043	2.50724
1.985	475	PV	.052	2.99231

TOTAL AREA= 15874
MUL FACTOR=1.0000E+00

*ID 1446-11I-DUP

*ID 1446-11I-DUP

* RUN #19184   JAN 25, 2022 10:57:14
START



RUN# 19184   JAN 25, 2022 10:57:14

IDENTIFIER : 1446-11I-DUP
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068	14654	PV	.047	100.00000

TOTAL AREA= 14654
MUL FACTOR=1.0000E+00

*ID 1446-16A

* RUN #19185   JAN 25, 2022 11:04:51
START

RUN# 19185   JAN 25, 2022 11:04:51

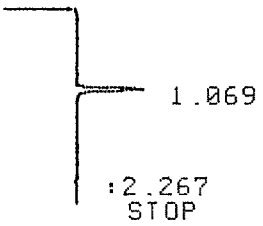
IDENTIFIER : 1446-16A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.075	933	VP	.054	100.00000

TOTAL AREA=   933
MUL FACTOR=1.0000E+00

*ID 1446-17I

* RUN #19186   JAN 25, 2022 11:10:14
START



RUN# 19186   JAN 25, 2022 11:10:14

IDENTIFIER : 1446-17I
AREA%

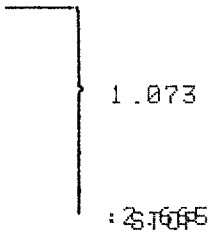
RT	AREA	TYPE	WIDTH	AREA%
1.069	11445	PU	.049	100.00000

TOTAL AREA= 11445
MUL FACTOR=1.0000E+00

*
*

*ID 1446-21A

* RUN #19187   JAN 25, 2022 11:16:13
START



RUN# 19187   JAN 25, 2022 11:16:13

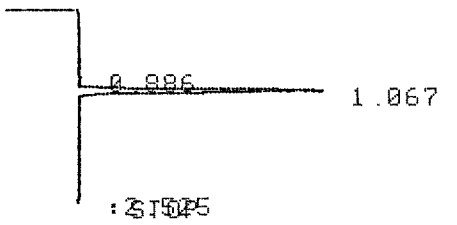
IDENTIFIER : 1446-21A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.073	1073	VP	.062	100.00000

TOTAL AREA=   1073
MUL FACTOR=1.0000E+00

*ID 1446-22I

* RUN #19188   JAN 25, 2022 11:21:59
START



RUN# 19188   JAN 25, 2022 11:21:59

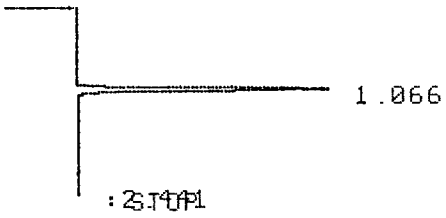
IDENTIFIER : 1446-22I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.067	38835	PV	.046	100.00000

TOTAL AREA= 38835
MUL FACTOR=1.0000E+00

*ID 1446-22I-DUP

* RUN #19189   JAN 25, 2022 11:27:32
START



RUN# 19189   JAN 25, 2022 11:27:32

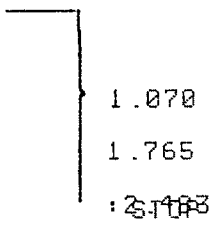
IDENTIFIER : 1446-22I-DUP
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.066	39874	PB	.046	100.00000

TOTAL AREA= 39874
MUL FACTOR=1.0000E+00

*ID 1446-26A

* RUN #19190   JAN 25, 2022 11:34:07
START



RUN# 19190   JAN 25, 2022 11:34:07

IDENTIFIER : 1446-26A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	1151	PU	.071	73.97171
1.765	405	PU	.057	26.02827

TOTAL AREA= 1556
MUL FACTOR=1.0000E+00

*

```
*ID 1446-27I

*  RUN #19191     JAN 25, 2022  11:48:12
START
```


```
RUN# 19191          JAN 25, 2022  11:48:12

IDENTIFIER : 1446-27I
AREA%
      RT       AREA TYPE  WIDTH      AREA%
   1.063        580   BP    .053  100.00000

TOTAL AREA=    580
MUL FACTOR=1.0000E+00




*ID 1446-31A

*  RUN #19192     JAN 25, 2022  11:54:28
START
```

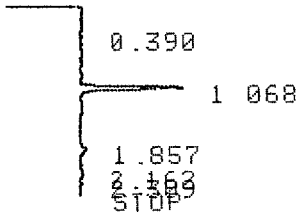

```
RUN# 19192          JAN 25, 2022 .11:54:28

IDENTIFIER : 1446-31A
AREA%
      RT       AREA TYPE  WIDTH      AREA%
   1.078       1038   PV    .062  100.00000

TOTAL AREA=   1038
MUL FACTOR=1.0000E+00
```

*ID 1446-32I

* RUN #19193   JAN 25, 2022 11:59:28
START



RUN# 19193   JAN 25, 2022 11:59:28

IDENTIFIER : 1446-32I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.390	390	PU	.050	1.87581
1.068	16879	PP	.047	81.18416
1.857	1906	VV	.077	9.16742
2.162	1616	VP	.120	7.77260

TOTAL AREA= 20791
MUL FACTOR=1.0000E+00

* PLOT

STOP

* PLOT

STOP

*ID 1446-36A

* RUN #19194   JAN 25, 2022 12:10:09
START

1.065

1.899

STOP

RUN# 19194 JAN 25, 2022 12:10:09

IDENTIFIER : 1446-36A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	1285	PU	.062	66.75325
1.899	640	VP	.083	33.24675

TOTAL AREA= 1925
MUL FACTOR=1.0000E+00

*ID 12173-500X-CCV

* RUN #19195 JAN 25, 2022 12:15:33
START

0.155

1.066

1.855

2.170

STOP

RUN# 19195 JAN 25, 2022 12:15:33

IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.155	503	PU	.068	.06569
1.066	154683	PB	.046	20.20075
1.855	307912	BB	.076	40.21163
2.170	302631	BB	.089	39.52194

TOTAL AREA= 765729
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**	
Analytes	**CAS**	Conc:	**ug/mL**

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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	CONCENTRATION	
methane	50010	ppm
ethane	50030	ppm
ethylene	50030	ppm
nitrogen	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 ± 2%. NIST traceable by weights or gaseous standards.

Judith M Zadravec

Judy Zadravec, Chemist

10/19/2018

DATE

Energy Laboratories Inc

Spike LOG

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

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	8/9/2

Final Volume: mL

Stock Source **Base Units** **Amount Added**

Analytes **CAS** Conc: **ug/mL**

Page: *1 of 1*

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 ± 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