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

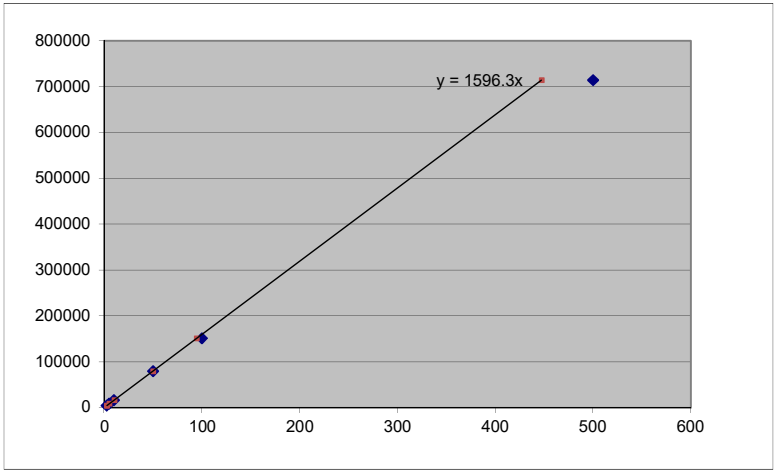
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14188893	LCS	HC-METHANE- CCV			1/20/2021 12:36:	1	R355741		0	0	

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

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

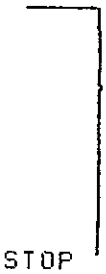
		Calculated Recoveries	
[PPM]	Area Cnts	PPM	% recovery
2.5	4682	2.933094	1.1732375
5	8741	5.475902	1.0951804
10	16844	10.55212	1.0552121
50	79772	49.9741	0.9994821
100	151345	94.81185	0.9481185
500	714053	447.3269	0.8946537
1000	1331471	834.1156	0.8341156

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



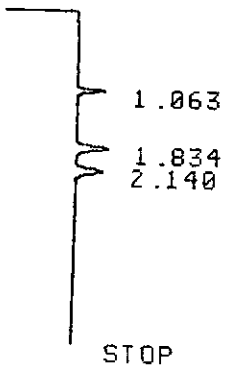
STOP

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%

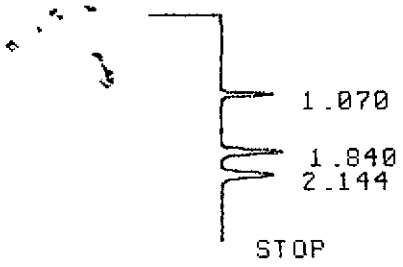
RT	AREA	TYPE	WIDTH	AREA%
1.063	4682	PP	.048	22.05370
1.834	8384	PU	.078	39.49128
2.140	8164	UP	.087	38.45502

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

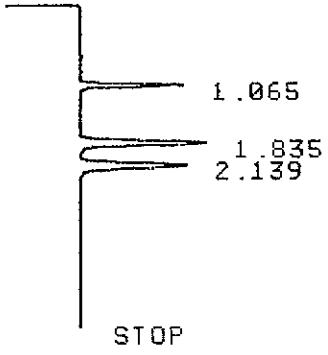
TOTAL AREA= 40739

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%

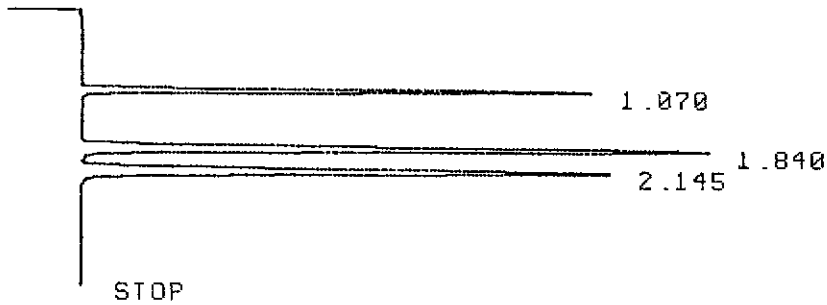
RT	AREA	TYPE	WIDTH	AREA%
1.065	16844	PV	.047	20.91955
1.835	31917	VP	.074	39.63958
2.139	31757	PV	.087	39.44088

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

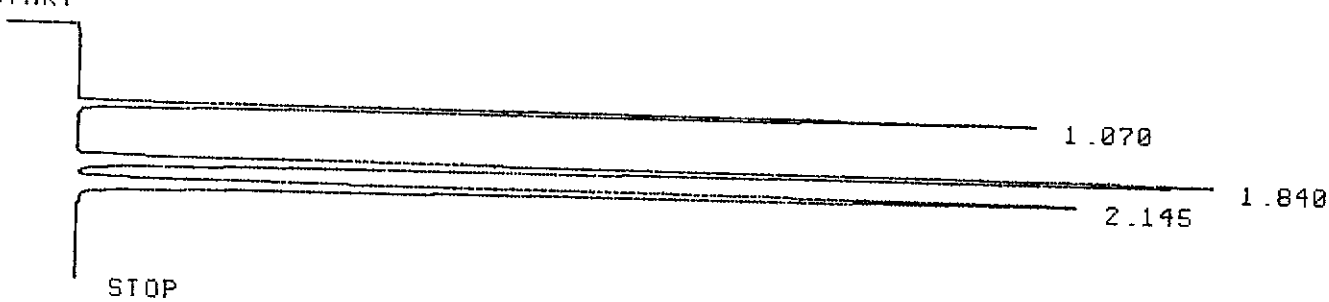
TOTAL AREA= 393018
MUL FACTOR=1.0000E+00

*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

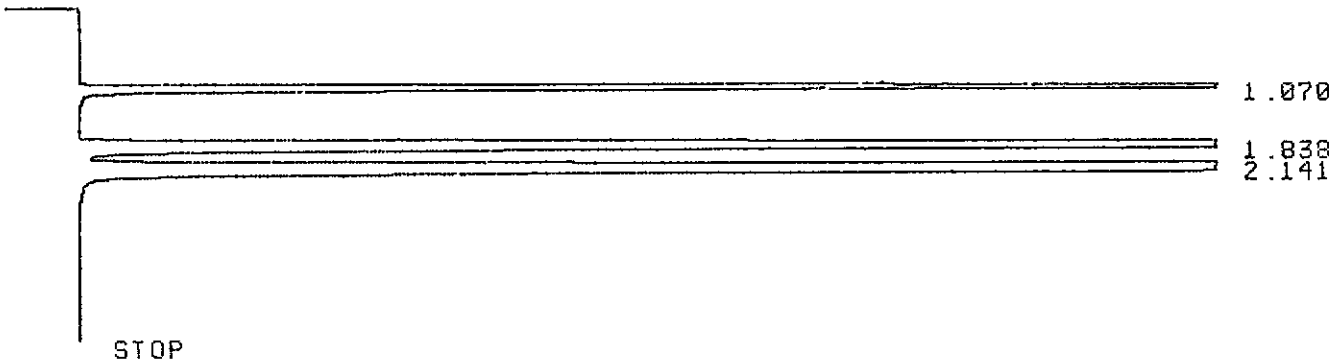
IDENTIFIER : CAL5-100PPM
AREA%

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

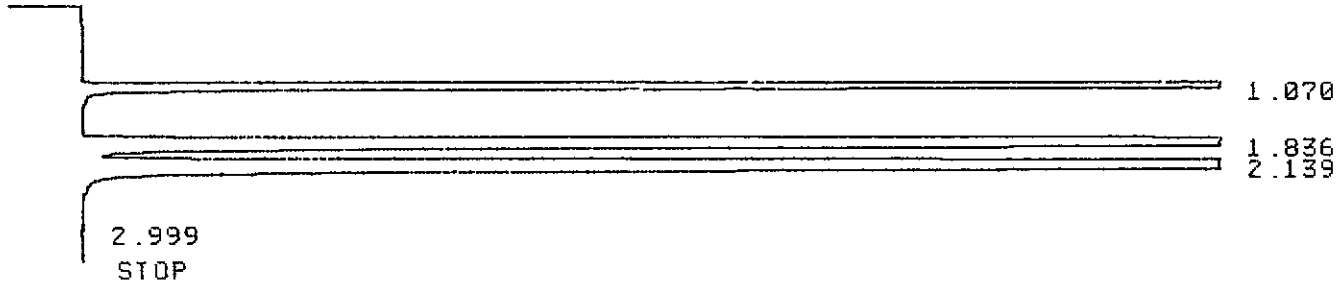
IDENTIFIER : CAL6-500PPM
AREA%

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%

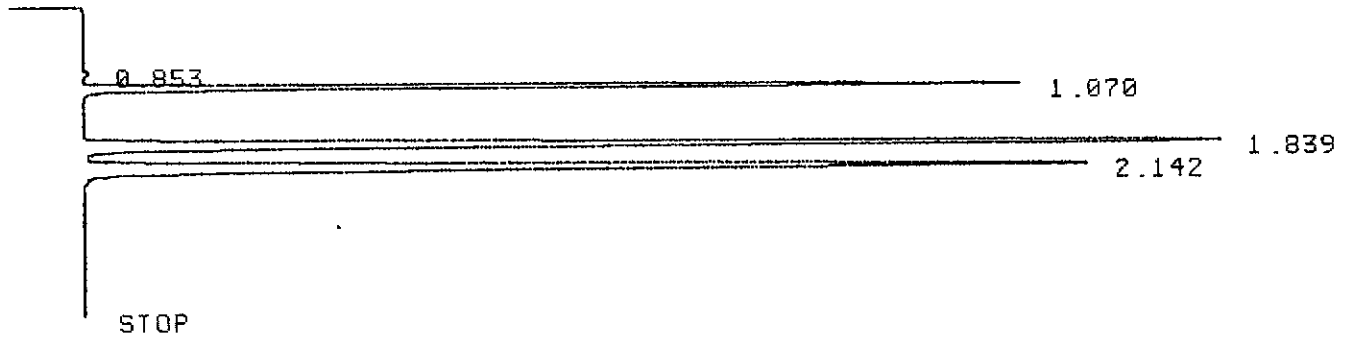
RT	AREA	TYPE	WIDTH	AREA%
1.070	1331471	PB	.049	21.86052

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

06-Jan-22

Run ID FID-HEADSPACE_220105A

Run Start Date: 1/5/2022
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
14964427	CCV	HC-METHANE-	CCV		1/5/2022 8:57:00	1	R372735		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		99.6700605		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
14964428	LCS	HC-METHANE-	LCS		1/5/2022 9:01:00	1	R372735		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		99.1707705		100	0	0	2	2	0	99%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14964429	LCSD	HC-METHANE-	LCSD		1/5/2022 9:07:00	1	R372735		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		97.7681227		100	0	99.170771	2	2	0	98%	85	115	1%	

1

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14964430	MBLK	HC-METHANE-	MBLK		1/5/2022 10:31:0	1	R372735		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
14964431	B22010096-001I	HC-METHANE-	SAMP		1/5/2022 10:37:0	1	R372735		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
14964432	B22010096-005	HC-METHANE-	SAMP		1/5/2022 10:43:0	1	R372735		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
14964433	B22010120-001I	HC-METHANE-	SAMP		1/5/2022 10:49:0	1	R372735		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00073205			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
14964434	B22010120-005	HC-METHANE-	SAMP		1/5/2022 10:54:0	1	R372735		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
14964435	B22010134-001I	HC-METHANE-	SAMP		1/5/2022 11:00:0	1	R372735		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.01527456			0	0	0.000704	0.002	0	0%	0	0	0%	

2

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14964436	B22010134-001I	HC-METHANE-	DUP		1/5/2022 11:09:0	1	R372735		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.01516106			0	0.0152746	0.000704	0.002	0	0%	0	0	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14964437	B22010134-005	HC-METHANE-	SAMP		1/5/2022 11:19:0	1	R372735		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
14964438	B22010141-001I	HC-METHANE-	SAMP		1/5/2022 11:25:0	1	R372735		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
14964439	B22010141-005	HC-METHANE-	SAMP		1/5/2022 11:31:0	1	R372735		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
14964440	B22010142-001I	HC-METHANE-	SAMP		1/5/2022 11:37:0	1	R372735		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
14964441	B22010142-005	HC-METHANE-	SAMP		1/5/2022 11:46:0	1	R372735		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
14964442	B22010143-001I	HC-METHANE-	SAMP		1/5/2022 11:52:0	1	R372735		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
14964443	B22010143-005	HC-METHANE-	SAMP		1/5/2022 12:02:0	1	R372735		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
14964444	B22010145-001I	HC-METHANE-	SAMP		1/5/2022 12:08:0	1	R372735		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00403763			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
14964445	B22010145-005	HC-METHANE-	SAMP		1/5/2022 12:18:0	1	R372735		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
14964446	B22010148-001I	HC-METHANE-	SAMP		1/5/2022 12:23:0	1	R372735		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
14964447	B22010148-005	HC-METHANE-	SAMP		1/5/2022 12:29:0	1	R372735		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
14964448	CCV	HC-METHANE-	CCV		1/5/2022 12:35:0	1	R372735		0	0	

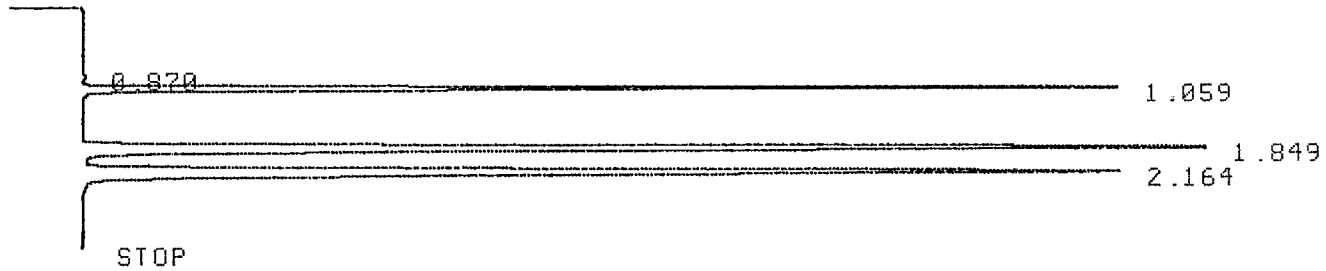
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		100.273343		100	0	0	2	2	0	100%	85	115	0%	

Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	159100	1	19	99.67006051	1/5/2022 8:57	jdw	CCV	HC-METHANE-CCV	Methane		
LCS	158303	1	19	99.17077051	1/5/2022 9:01	jdw	LCS	HC-METHANE-CCV	Methane		
LCSD	156064	1	19	97.76812271	1/5/2022 9:07	jdw	LCSD	HC-METHANE-CCV	Methane		
MBLK	832	1	19	0.000121692	1/5/2022 10:31	jdw	MBLK	HC-METHANE-W	Methane	10	32
B22010096-001I	1629	1	19	0.000116573	1/5/2022 10:37	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010096-005A	1093	1	19	3.81751E-05	1/5/2022 10:43	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010120-001I	5837	1	19	0.000732054	1/5/2022 10:49	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010120-005A	942	1	19	1.60891E-05	1/5/2022 10:54	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010134-001I	105263	1	19	0.015274557	1/5/2022 11:00	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010134-001IDUP	104487	1	19	0.015161055	1/5/2022 11:09	jdw	DUP	HC-METHANE-W	Methane	10	32
B22010134-005A	1328	1	19	7.25472E-05	1/5/2022 11:19	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010141-001I	1758	1	19	0.000135441	1/5/2022 11:25	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010141-005A	4074	1	19	0.00047419	1/5/2022 11:31	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010142-001I	4338	1	19	0.000512804	1/5/2022 11:37	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010142-005A	1882	1	19	0.000153578	1/5/2022 11:46	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010143-001I	4089	1	19	0.000476384	1/5/2022 11:52	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010143-005A	906	1	19	1.08236E-05	1/5/2022 12:02	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010145-001I	28437	1	19	0.004037634	1/5/2022 12:08	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010145-005A	2507	1	19	0.000244993	1/5/2022 12:18	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010148-001I	4721	1	19	0.000568823	1/5/2022 12:23	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010148-005A	981	1	19	2.17934E-05	1/5/2022 12:29	jdw	SAMP	HC-METHANE-W	Methane	10	32
CCV	160063	1	19	100.2733431	1/5/2022 12:35	jdw	CCV	HC-METHANE-CCV	Methane		

JDW
1/5/2022

*ID 12173-500X-CCV

* RUN #18876   JAN 5, 2022 08:57:03
START



RUN# 18876   JAN 5, 2022 08:57:03

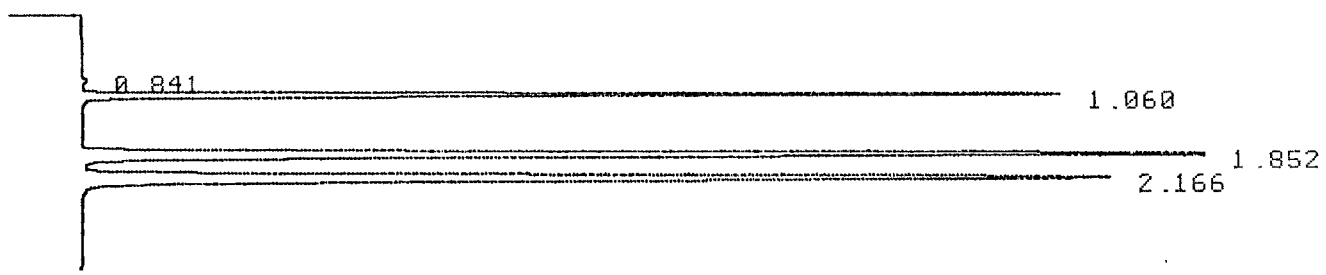
IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.870	441	PV	.074	.05593
1.059	159100	VB	.045	20.17840
1.849	317027	PB	.075	40.20802
2.164	311899	BB	.088	39.55765

TOTAL AREA= 788467
MUL FACTOR=1.0000E+00

*ID 10711-LCS

* RUN #18877   JAN 5, 2022 09:01:47
START



```
RUN# 18877          JAN  5, 2022  09:01:47

IDENTIFIER : 10711-LCS
AREA%
      RT      AREA TYPE  WIDTH      AREA%
    .841       910   PP    .052     .11599
   1.060    158303   PB    .047   20.17768
   1.852    315922   PB    .075   40.26819
   2.166    309410   BB    .088   39.43814

TOTAL AREA= 784545
MUL FACTOR=1.00000E+00
```

```
*ID 10711-LCSD

* RUN #18878     JAN  5, 2022  09:07:10
START
```



```
RUN# 18878          JAN  5, 2022  09:07:10

IDENTIFIER : 10711-LCSD
AREA%
      RT      AREA TYPE  WIDTH      AREA%
    .844       908   UU    .049     .11685
   1.065    156064   PB    .048   20.08453
   1.856    312619   BU    .076   40.23224
   2.171    307445   UB    .089   39.56637

TOTAL AREA= 777036
MUL FACTOR=1.00000E+00
```

*

*ID MB

* RUN #18879   JAN 5, 2022 10:31:36
START

RUN# 18879   JAN 5, 2022 10:31:36

IDENTIFIER : MB
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.067	832	VV	.064	100.00000

TOTAL AREA=   832
MUL FACTOR=1.0000E+00

*ID 0096-1I

* RUN #18880   JAN 5, 2022 10:37:38
START

RUN# 18880   JAN 5, 2022 10:37:38

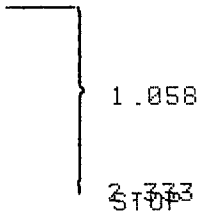
IDENTIFIER : 0096-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.879	988	PV	.123	32.84574
1.058	1629	VV	.073	54.15558
2.633	391	I PH	.031	12.99867

TOTAL AREA=   3008
MUL FACTOR=1.0000E+00

*ID 0096-5A

* RUN #18881   JAN 5, 2022 10:43:38
START



RUN# 18881   JAN 5, 2022 10:43:38

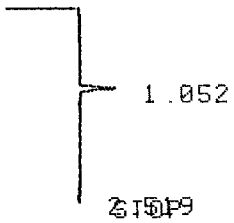
IDENTIFIER : 0096-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.058	1093	VP	.057	65.33174
2.333	580	PP	.050	34.66826

TOTAL AREA=   1673
MUL FACTOR=1.0000E+00

*ID 0120-1I

* RUN #18882   JAN 5, 2022 10:49:20
START



RUN# 18882   JAN 5, 2022 10:49:20

IDENTIFIER : 0120-1I
AREA%

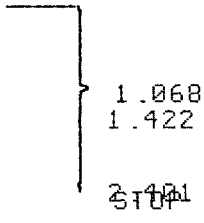
RT	AREA	TYPE	WIDTH	AREA%
1.052	5837	PP	.047	100.00000

TOTAL AREA=   5837
MUL FACTOR=1.0000E+00

*

*ID ID 0120-5A

* RUN #18883   JAN 5, 2022 10:54:50
START



RUN# 18883   JAN 5, 2022 10:54:50

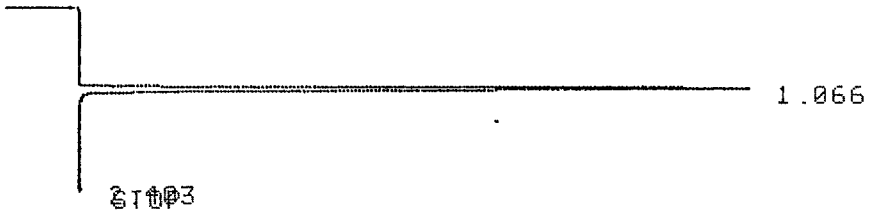
IDENTIFIER : ID 0120-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068	942	BP	.038	66.47850
1.422	475	PU	.068	33.52154

TOTAL AREA= 1417
MUL FACTOR=1.0000E+00

*ID 0134-1I

* RUN #18884   JAN 5, 2022 11:00:14
START



RUN# 18884   JAN 5, 2022 11:00:14

IDENTIFIER : 0134-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.066	105263	PB	.046	100.00000

TOTAL AREA= 105263
MUL FACTOR=1.0000E+00

```
*  PLOT
```

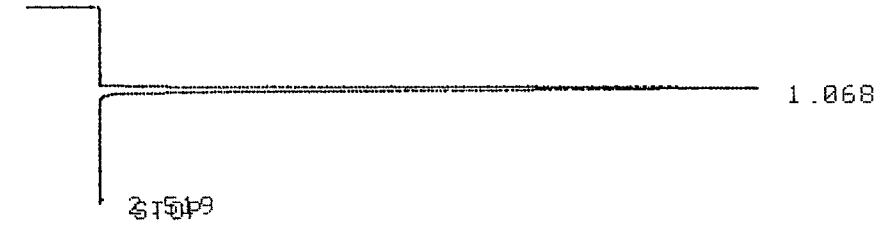
```
STOP

*  PLOT
```

```
STOP

*ID 0134-1I-DUP


*  RUN #18885     JAN  5, 2022  11:09:45
START
```




```


RUN# 18885          JAN  5, 2022  11:09:45

IDENTIFIER : 0134-1I-DUP
AREA%
       RT       AREA TYPE  WIDTH       AREA%
   1.068     104487   PB    .046  100.00000

TOTAL AREA= 104487
MUL FACTOR=1.0000E+00




*  PLOT
```

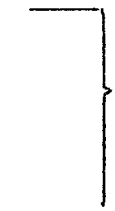
```
STOP

*  PLOT
```

STOP

*ID 0134-5A

* RUN #18886   JAN 5, 2022 11:19:38
START



1.070

STOP

RUN# 18886   JAN 5, 2022 11:19:38

IDENTIFIER : 0134-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	1328	PU	.053	100.00000

TOTAL AREA=   1328
MUL FACTOR=1.0000E+00

*ID 0141-1I

* RUN #18887   JAN 5, 2022 11:25:14
START

0.870
1.064

STOP

RUN# 18887   JAN 5, 2022 11:25:14

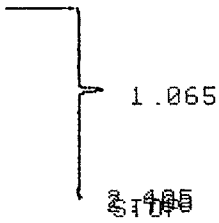
IDENTIFIER : 0141-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.870	1566	PU	.139	47.11190
1.064	1758	VV	.083	52.88810

TOTAL AREA=   3324
MUL FACTOR=1.0000E+00

*ID 141-5A

* RUN #18888   JAN 5, 2022 11:31:39
START



RUN# 18888   JAN 5, 2022 11:31:39

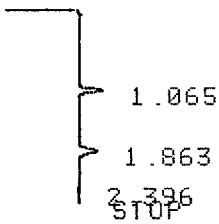
IDENTIFIER : 141-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	4074	PU	.049	91.12054
2.468	397	I VH	.045	8.87944

TOTAL AREA= 4471
MUL FACTOR=1.0000E+00

*ID 0142-1I

* RUN #18889   JAN 5, 2022 11:37:52
START



RUN# 18889   JAN 5, 2022 11:37:52

IDENTIFIER : 0142-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	4338	PP	.051	44.36490
1.863	5440	VV	.081	55.63510

TOTAL AREA= 9778
MUL FACTOR=1.0000E+00

* PLOT

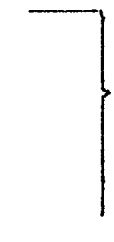
STOP

* PLOT

STOP

*ID 0142-5A

* RUN #18890   JAN 5, 2022 11:46:21
START



1.066

STOP

RUN# 18890   JAN 5, 2022 11:46:21

IDENTIFIER : 0142-5A
AREA%

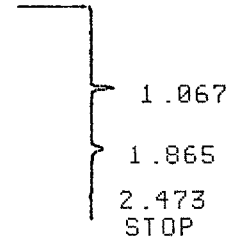
RT	AREA	TYPE	WIDTH	AREA%
1.066	1882	VP	.064	100.00000

TOTAL AREA=   1882
MUL FACTOR=1.0000E+00

*

*ID 0143-1I

* RUN #18891   JAN 5, 2022 11:52:39
START



RUN# 18891   JAN 5, 2022 11:52:39

IDENTIFIER : 0143-1I
AREA%

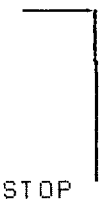
RT	AREA	TYPE	WIDTH	AREA%
1.067	4089	VP	.052	50.80765
1.865	3527	PP	.086	43.82456
2.473	432	PV	.043	5.36780

TOTAL AREA= 8048
MUL FACTOR=1.0000E+00

* PLOT

STOP

* PLOT



STOP

*

*ID 0143-5A

* RUN #18892   JAN 5, 2022 12:02:35
START

RUN# 18892   JAN 5, 2022 12:02:35

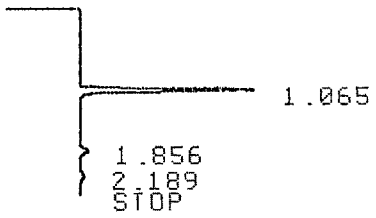
IDENTIFIER : 0143-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.063	906	BP	.046	100.00000

TOTAL AREA=   906
MUL FACTOR=1.0000E+00

*ID 0145-1I

* RUN #18893   JAN 5, 2022 12:08:55
START



RUN# 18893   JAN 5, 2022 12:08:55

IDENTIFIER : 0145-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	28437	PU	.047	87.00854
1.856	2723	UP	.079	8.33155
2.189	1523	UU	.081	4.65992

TOTAL AREA= 32683
MUL FACTOR=1.0000E+00

* PLOT

STOP

* PLOT

STOP

*ID 0145-5A

* RUN #18894 JAN 5, 2022 12:18:14
START

1.068

2.038
STOP

RUN# 18894 JAN 5, 2022 12:18:14

IDENTIFIER : 0145-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068	2507	BP	.048	86.50794
2.038	391	PU	.043	13.49206

TOTAL AREA= 2898
MUL FACTOR=1.0000E+00

*ID 0148-1I

* RUN #18895 JAN 5, 2022 12:23:23
START

1.065

1.876
2.290
STOP

RUN# 18895 JAN 5, 2022 12:23:23

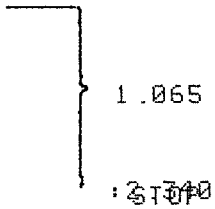
IDENTIFIER : 0148-1I

RT	AREA	TYPE	WIDTH	AREA%
1.065	4721	PU	.049	84.98650
1.876	834	VV	.076	15.01350

TOTAL AREA= 5555
MUL FACTOR=1.0000E+00

*ID 0148-5A

* RUN #18896 JAN 5, 2022 12:29:21
START



RUN# 18896 JAN 5, 2022 12:29:21

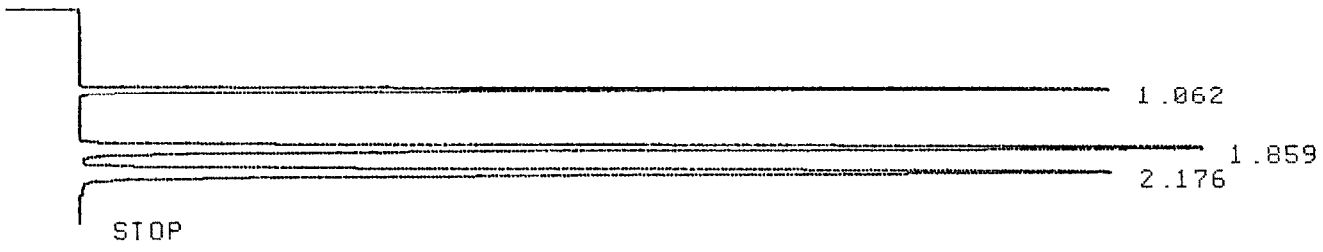
IDENTIFIER : 0148-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.065	981	BP	.044	100.00000

TOTAL AREA= 981
MUL FACTOR=1.0000E+00

*ID 12173-500X-CCV

* RUN #18897 JAN 5, 2022 12:35:13
START



RUN# 18897 JAN 5, 2022 12:35:13

IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.062	160063	PB	.045	20.14782
1.859	319848	VV	.076	40.26067
2.176	314532	VB	.089	39.59152

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**

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# 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