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

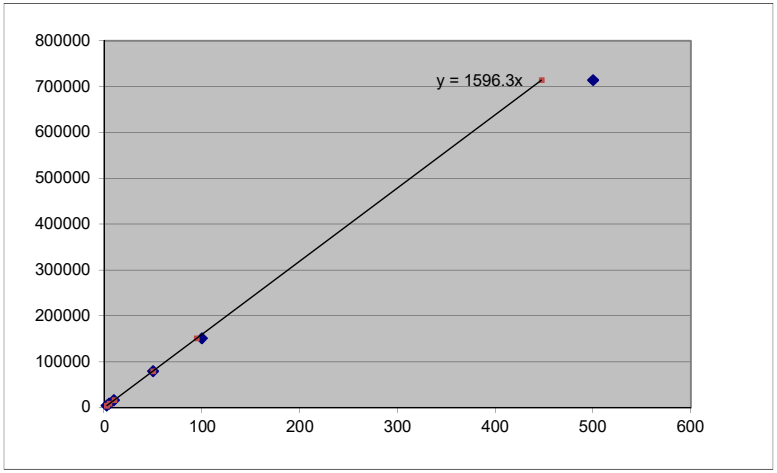
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14188893	LCS	HC-METHANE- CCV			1/20/2021 12:36:	1	R355741		0	0	

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	Sample Conc ppm	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

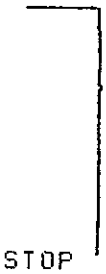
		Calculated Recoveries	
[PPM]	Area Cnts	PPM	% recovery
2.5	4682	2.933094	1.1732375
5	8741	5.475902	1.0951804
10	16844	10.55212	1.0552121
50	79772	49.9741	0.9994821
100	151345	94.81185	0.9481185
500	714053	447.3269	0.8946537
1000	1331471	834.1156	0.8341156

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



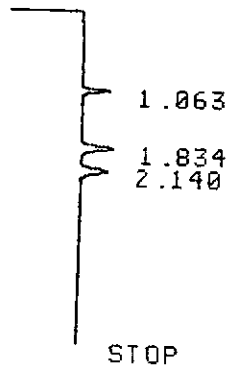
STOP

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%

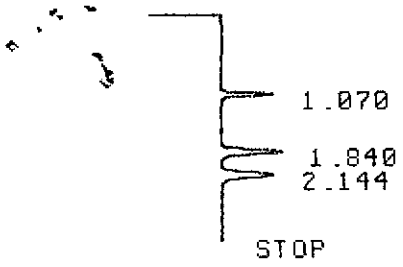
RT	AREA	TYPE	WIDTH	AREA%
1.063	4682	PP	.048	22.05370
1.834	8384	PU	.078	39.49128
2.140	8164	UP	.087	38.45502

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

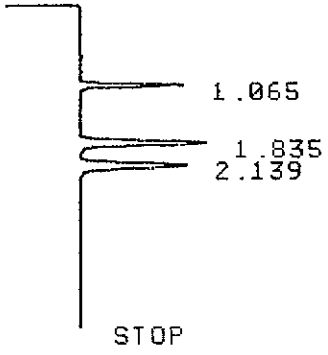
TOTAL AREA= 40739

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%

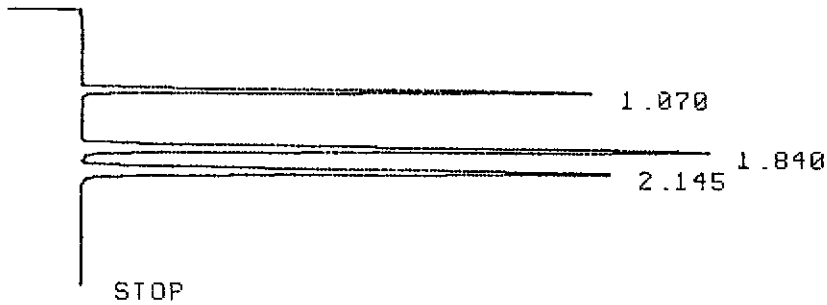
RT	AREA	TYPE	WIDTH	AREA%
1.065	16844	PV	.047	20.91955
1.835	31917	VP	.074	39.63958
2.139	31757	PV	.087	39.44088

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

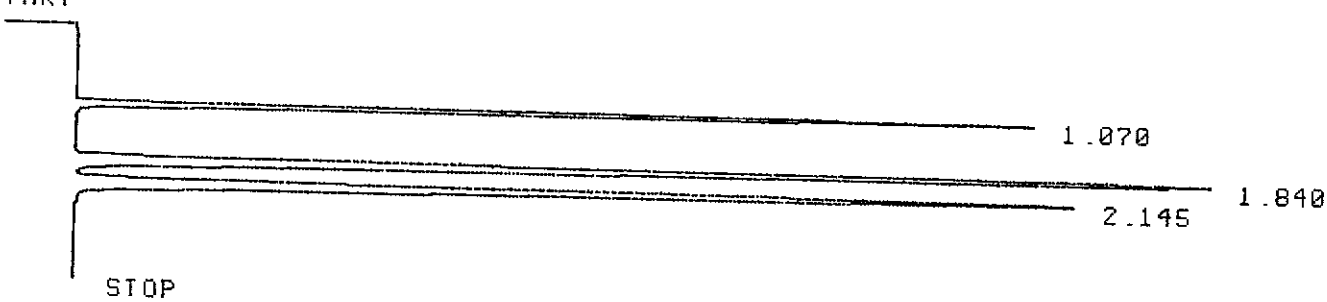
TOTAL AREA= 393018
MUL FACTOR=1.0000E+00

*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

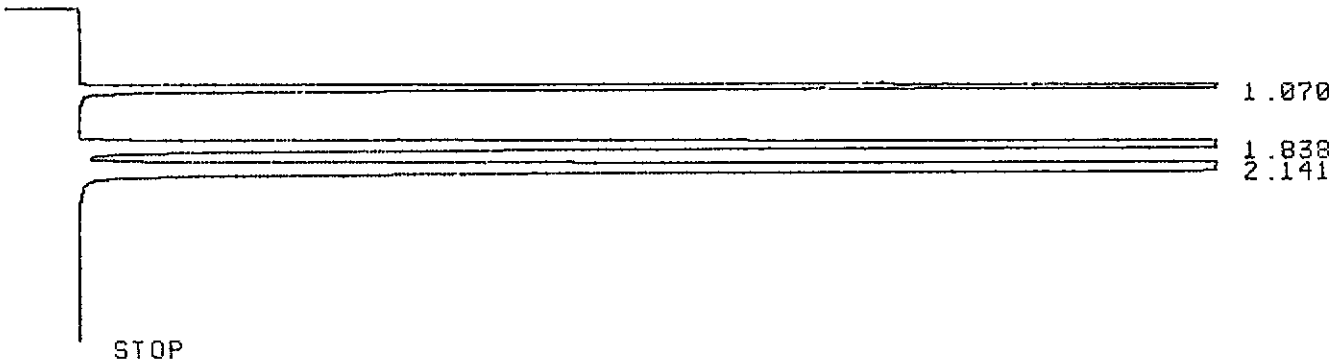
IDENTIFIER : CAL5-100PPM
AREA%

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

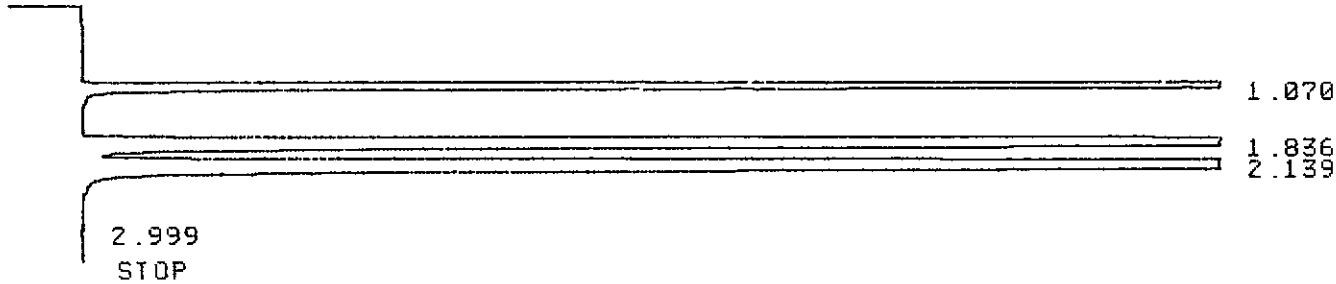
IDENTIFIER : CAL6-500PPM
AREA%

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%

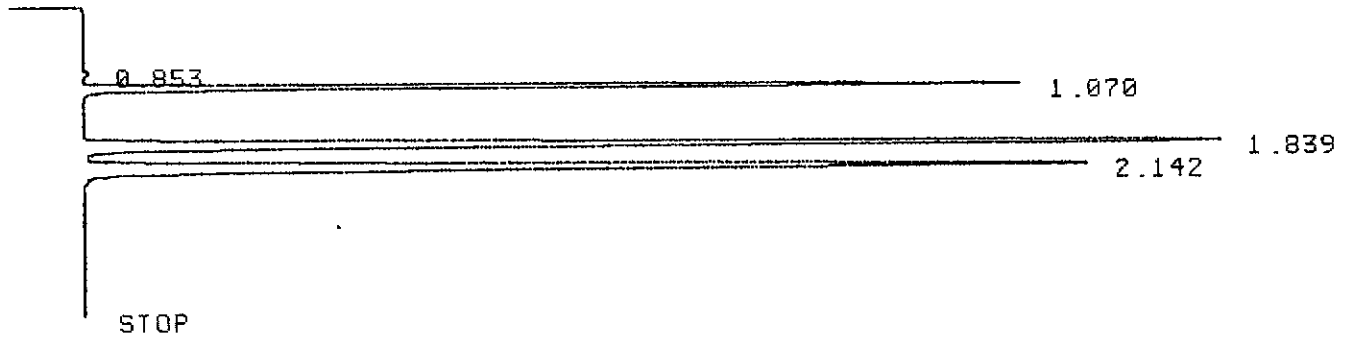
RT	AREA	TYPE	WIDTH	AREA%
1.070	1331471	PB	.049	21.66052

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

07-Jan-22

Run ID FID-HEADSPACE_220106A

Run Start Date: 1/6/2022
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
14966664	CCV	HC-METHANE-	CCV		1/6/2022 8:59:00	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		97.9660846		100	0	0	2	2	0	98%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14966665	LCS	HC-METHANE-	LCS		1/6/2022 9:03:00	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		96.904232		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
14966666	LCSD	HC-METHANE-	LCSD		1/6/2022 9:09:00	1	R372805		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		97.5507405		100	0	96.904232	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
14966667	MBLK	HC-METHANE-	MBLK		1/6/2022 10:18:0	1	R372805		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
14966668	B22010209-001I	HC-METHANE-	SAMP		1/6/2022 10:25:0	1	R372805		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%	UT

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14966669	B22010209-005	HC-METHANE-	SAMP		1/6/2022 10:29:0	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00155446			0	0	0.000704	0.002	0	0%	0	0	0%	JT

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14966670	B22010211-001I	HC-METHANE-	SAMP		1/6/2022 10:38:0	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.0019568			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
14966671	B22010211-005	HC-METHANE-	SAMP		1/6/2022 10:45:0	1	R372805		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
14966672	B22010212-001I	HC-METHANE-	SAMP		1/6/2022 10:51:0	1	R372805		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

2

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14966673	B22010212-005	HC-METHANE-	SAMP		1/6/2022 10:58:0	1	R372805		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
14966674	B22010213-001I	HC-METHANE-	SAMP		1/6/2022 11:04:0	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00246852			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
14966675	B22010213-001I	HC-METHANE-	DUP		1/6/2022 11:10:0	1	R372805		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00262216			0	0.0024685	0.000704	0.002	0	0%	0	0	6%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
14966676	B22010213-003I	HC-METHANE-	SAMP		1/6/2022 11:19:0	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00257411			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
14966677	B22010213-007	HC-METHANE-	SAMP		1/6/2022 11:28:0	1	R372805		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
14966678	B22010214-001I	HC-METHANE-	SAMP		1/6/2022 11:34:0	1	R372805		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
14966679	B22010214-005	HC-METHANE-	SAMP		1/6/2022 11:41:0	1	R372805		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
14966680	B22010219-001I	HC-METHANE-	SAMP		1/6/2022 11:47:0	1	R372805		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00905860			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
14966681	B22010219-005	HC-METHANE-	SAMP		1/6/2022 11:58:0	1	R372805		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
14966682	CCV	HC-METHANE-	CCV		1/6/2022 12:05:0	1	R372805		0	0	

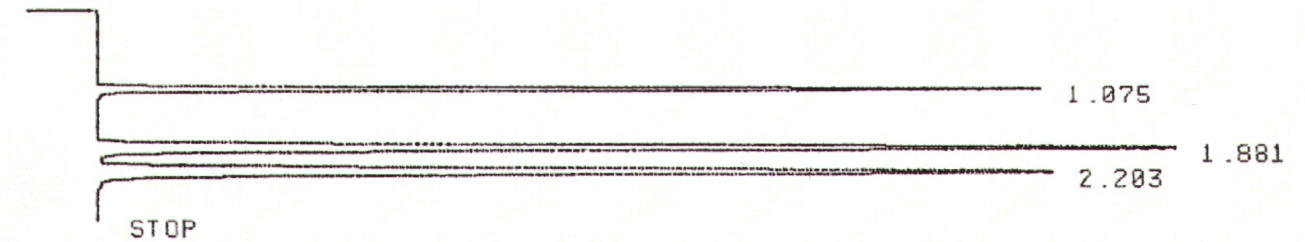
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		97.7092353		100	0	0	2	2	0	98%	85	115	0%	

Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	156380	1	19.5	97.96608462	1/6/2022 8:59	jdw	CCV	HC-METHANE-CCV	Methane		
LCS	154685	1	19.5	96.90423199	1/6/2022 9:03	jdw	LCS	HC-METHANE-CCV	Methane		
LCSD	155717	1	19.5	97.55074049	1/6/2022 9:09	jdw	LCSD	HC-METHANE-CCV	Methane		
MBLK	664	1	19.5	9.69709E-05	1/6/2022 10:18	jdw	MBLK	HC-METHANE-W	Methane	10	32
B22010209-001I	1161	1	19.5	7.25821E-05	1/6/2022 10:25	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010209-005A	11308	1	19.5	0.001554456	1/6/2022 10:29	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010211-001I	14063	1	19.5	0.001956797	1/6/2022 10:38	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010211-005A	1065	1	19.5	5.85623E-05	1/6/2022 10:45	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010212-001I	694	1	19.5	4.38122E-06	1/6/2022 10:51	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010212-005A	1572	1	19.5	0.000132605	1/6/2022 10:58	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010213-001I	17567	1	19.5	0.002468523	1/6/2022 11:04	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010213-001IDUP	18619	1	19.5	0.002622158	1/6/2022 11:10	jdw	DUP	HC-METHANE-W	Methane	10	32
B22010213-003I	18290	1	19.5	0.002574111	1/6/2022 11:19	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010213-007A	1119	1	19.5	6.64484E-05	1/6/2022 11:28	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010214-001I	1506	1	19.5	0.000122966	1/6/2022 11:34	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010214-005A	451	1	19.5	-3.11066E-05	1/6/2022 11:41	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010219-001I	62692	1	19.5	0.009058603	1/6/2022 11:47	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22010219-005A	1289	1	19.5	9.12753E-05	1/6/2022 11:58	jdw	SAMP	HC-METHANE-W	Methane	10	32
CCV	155970	1	19.5	97.70923531	1/6/2022 12:05	jdw	CCV	HC-METHANE-CCV	Methane		

JAW
1/6/2022

*ID 12173-500X-CCV

* RUN #18898   JAN 6, 2022 08:59:19
START



RUN# 18898   JAN 6, 2022 08:59:19

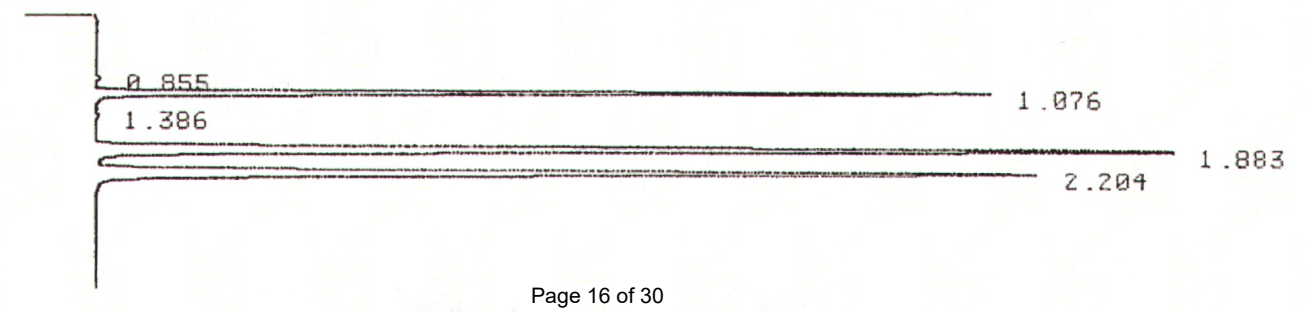
IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.075	156380	PB	.047	20.14358
1.881	312730	PB	.077	40.28328
2.203	307217	BB	.090	39.57315

TOTAL AREA= 776327
MUL FACTOR=1.0000E+00

*ID 10711-LCS

* RUN #18899   JAN 6, 2022 09:03:37
START



RUN# 18899 JAN 6, 2022 09:03:37

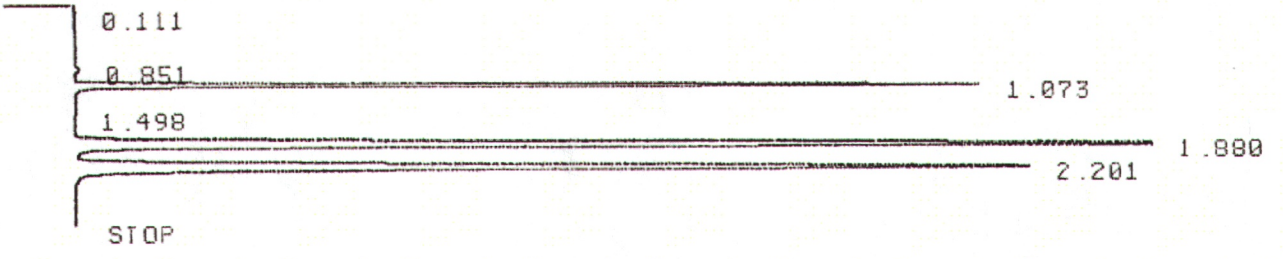
IDENTIFIER : 10711-LCS
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.855	1146	VV	.061	.14977
1.076	154685	PB	.048	20.21548
1.386	669	BP	.049	.08743
1.883	307122	PB	.077	40.13718
2.204	301559	BB	.090	39.41016

TOTAL AREA= 765181
MUL FACTOR=1.0000E+00

*ID 10711-LCSD

* RUN #18900 JAN 6, 2022 09:09:00
START



RUN# 18900 JAN 6, 2022 09:09:00

IDENTIFIER : 10711-LCSD
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.851	1159	PP	.062	.15017
1.073	155717	VB	.048	20.17559
1.498	414	PV	.058	.05364
1.880	310007	PB	.076	40.16629
2.201	304512	BB	.090	39.45434

TOTAL AREA= 771809
MUL FACTOR=1.0000E+00

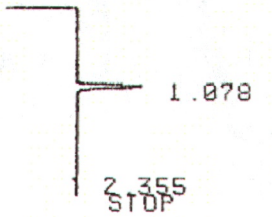
*

```
*ID MB

*  RUN #18901      JAN  6, 2022  10:18:43
START
```

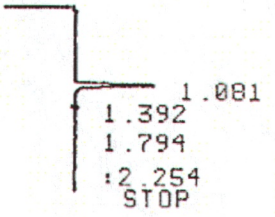

```
RUN# 18901           JAN  6, 2022  10:18:43

IDENTIFIER : MB
AREA%
      RT       AREA TYPE  WIDTH       AREA%
   1.081        664   PP    .053  100.00000

TOTAL AREA=     664
MUL FACTOR=1.0000E+00



*ID 209-1I

*  RUN #18902      JAN  6, 2022  10:25:30
START
```


```
RUN# 18902           JAN  6, 2022  10:25:30

IDENTIFIER : 209-1I
AREA%
      RT       AREA TYPE  WIDTH       AREA%
   1.075       1161   VV    .060  100.00000

TOTAL AREA=    1161
MUL FACTOR=1.0000E+00
```

```
*
*ID ID 209-5A

*  RUN #18903      JAN  6, 2022  10:29:29
START
```

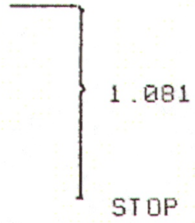



```
RUN# 18903           JAN  6, 2022  10:29:29

IDENTIFIER : ID 209-5A
AREA%
      RT       AREA TYPE  WIDTH       AREA%
   1.078      11308   VV    .048    94.06090
   2.355        714 I PB    .042     5.93911

TOTAL AREA=  12022
MUL FACTOR=1.0000E+00



*ID 211-1I

*  RUN #18904      JAN  6, 2022  10:38:16
START
```




```
RUN# 18904           JAN  6, 2022  10:38:16

IDENTIFIER : 211-1I
AREA%
      RT       AREA TYPE  WIDTH       AREA%
   1.081      14063   BV    .049    96.13098
   1.392        566   PV    .022     3.86903

TOTAL AREA=  14629
MUL FACTOR=1.0000E+00



*ID 211-5A
```

* RUN #18905 JAN 6, 2022 10:45:37
START



RUN# 18905 JAN 6, 2022 10:45:37

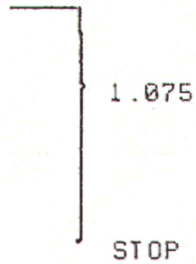
IDENTIFIER : 211-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.081	1065	PV	.070	100.00000

TOTAL AREA= 1065
MUL FACTOR=1.0000E+00

*ID 212-1I

* RUN #18906 JAN 6, 2022 10:51:31
START



RUN# 18906 JAN 6, 2022 10:51:31

IDENTIFIER : 212-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.075	694	PV	.053	100.00000

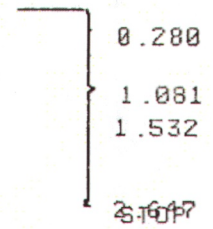
TOTAL AREA= 694
MUL FACTOR=1.0000E+00

*

~~*ID 2212~~ JDW 1/6/2022

*ID 212-5A

* RUN #18907 JAN 6, 2022 10:58:19
START



RUN# 18907 JAN 6, 2022 10:58:19

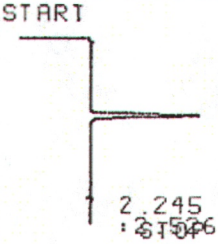
IDENTIFIER : 212-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.280	307	VP	.028	9.41718
1.081	1572	BV	.067	48.22085
1.532	891	VV	.078	27.33130
2.647	490	PP	.043	15.03068

TOTAL AREA= 3260
MUL FACTOR=1.0000E+00

*ID 213-1I

* RUN #18908 JAN 6, 2022 11:04:45
START



RUN# 18908 JAN 6, 2022 11:04:45

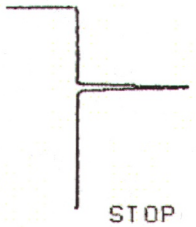
IDENTIFIER : 213-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.077	17567	BP	.045	92.96186
2.245	1330	PV	.058	7.03815

TOTAL AREA= 18897
MUL FACTOR=1.0000E+00

*ID 213-1I-DUP

* RUN #18909   JAN 6, 2022 11:10:29
START



RUN# 18909   JAN 6, 2022 11:10:29

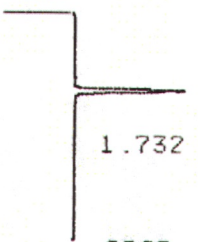
IDENTIFIER : 213-1I-DUP
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.079	18619	VV	.047	100.00000

TOTAL AREA= 18619
MUL FACTOR=1.0000E+00

*ID 213-3I

* RUN #18910   JAN 6, 2022 11:19:47
START



RUN# 18910   JAN 6, 2022 11:19:47

IDENTIFIER : 213-3I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.074	18290	VP	.047	97.44272
1.732	480	PV	.062	2.55727

TOTAL AREA= 18770
MUL FACTOR=1.0000E+00

*

*ID 213-7A

* RUN #18911 JAN 6, 2022 11:28:16
START

RUN# 18911 JAN 6, 2022 11:28:16

IDENTIFIER : 213-7A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.077	1119	PU	.060	76.48666
2.409	344	BP	.021	23.51333

TOTAL AREA= 1463
MUL FACTOR=1.0000E+00

*ID 214-1I

* RUN #18912 JAN 6, 2022 11:34:14
START

RUN# 18912 JAN 6, 2022 11:34:14

IDENTIFIER : 214-1I
AREA%

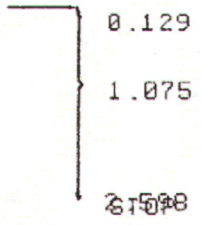
RT	AREA	TYPE	WIDTH	AREA%
1.078	1506	VP	.063	100.00000

TOTAL AREA= 1506
MUL FACTOR=1.0000E+00

* PLOT
STOP

*ID 214-5A

* RUN #18913   JAN 6, 2022 11:41:13
START



RUN# 18913   JAN 6, 2022 11:41:13

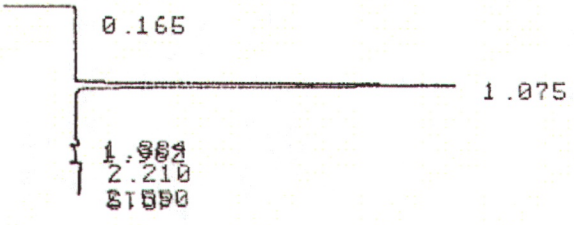
IDENTIFIER : 214-5A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.129	309	PU	.036	40.65790
1.075	451	BP	.045	59.34210

TOTAL AREA= 760
MUL FACTOR=1.0000E+00

*ID 219-1I

* RUN #18914   JAN 6, 2022 11:47:11
START



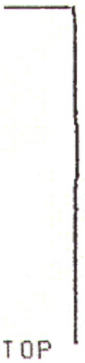
RUN# 18914   JAN 6, 2022 11:47:11

IDENTIFIER : 219-1I
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.165	532	PU	.072	.74301
1.075	62692	PB	.046	87.55744
1.884	4811	VP	.133	6.71918
1.962	824	PU	.045	1.15082
2.210	1991	VV	.084	2.78069
2.550	751	VV	.048	1.04887

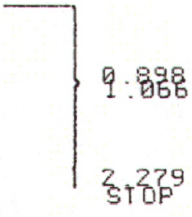
TOTAL AREA= 71601
MUL FACTOR=1.0000E+00

```
*  PLOT
```



```
STOP

*  PLOT
```

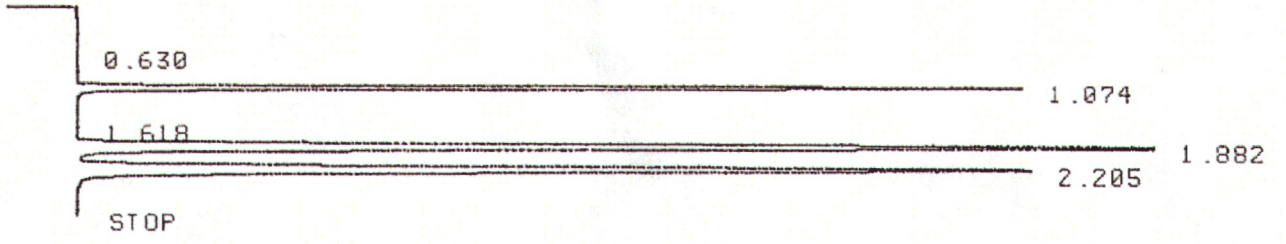
```
STOP

*ID 219-5A


*  RUN #18915      JAN  6, 2022  11:58:57
START
```




```
RUN# 18915           JAN  6, 2022  11:58:57

IDENTIFIER : 219-5A
AREA%
      RT       AREA TYPE  WIDTH       AREA%
    .898        521   PU    .062    20.98268
   1.066       1289   PU    .073    51.91302
   2.279        673   BU    .064    27.10431

TOTAL AREA=   2483
MUL FACTOR=1.0000E+00




*
```

*ID 12173-500X-CCU

* RUN #18916   JAN 6, 2022 12:05:24
START



RUN# 18916   JAN 6, 2022 12:05:24

IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.074	155970	PB	.046	20.09925
1.618	307 I	PB	.037	.03956
1.882	312235	BB	.077	40.23653
2.205	307487	BB	.090	39.62467

TOTAL AREA= 775999
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**

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