

Energy Laboratories Inc

ANALYTICAL RUN Summary

17-Feb-22

Run ID FID-HEADSPACE_220131B

Run Start Date: 1/31/2022
Analyst: Jeff Whitmer
Ical:
Column ID: porapak Q
Comments: 2022 Calibration for methane, ethane, and ethene. 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					
15038722	CCV	HC-METHANE-	CCV		1/31/2022 10:32:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		103.519361		100	0	0	2	2	0	104%	85	115	0%	
Ethene	A	ppm		103.057616		100	0	0	2	2	0	103%	85	115	0%	
Methane	A	ppm		103.620197		100	0	0	2	2	0	104%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038723	LCS	HC-METHANE-	LCS		1/31/2022 10:37:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		99.5410871		100	0	0	2	2	0	100%	85	115	0%	
Ethene	A	ppm		99.2906216		100	0	0	2	2	0	99%	85	115	0%	
Methane	A	ppm		100.809349		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					
15038724	MBLK	HC-METHANE-	MBLK		1/31/2022 11:15:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

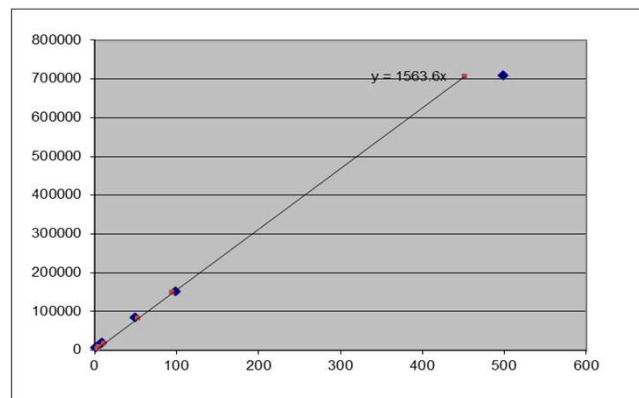
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038724	MBLK	HC-METHANE-	MBLK		1/31/2022 11:15:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		0			0	0	2	2	0	0%	0	0	0%	
Ethene	A	ppm		0			0	0	2	2	0	0%	0	0	0%	
Methane	A	ppm		0			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					
15038725	CAL1	HC-METHANE-	CAL1		1/31/2022 11:22:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		2.73020074		2.5	0	0	2	2	0	109%	50	150	0%	
Ethene	A	ppm		2.71682887		2.5	0	0	2	2	0	109%	50	150	0%	
Methane	A	ppm		2.85177946		2.5	0	0	2	2	0	114%	50	150	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038726	CAL2	HC-METHANE-	CAL2		1/31/2022 11:28:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		5.21991748		5	0	0	2	2	0	104%	85	115	0%	
Ethene	A	ppm		5.31883543		5	0	0	2	2	0	106%	85	115	0%	
Methane	A	ppm		4.91242836		5	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					
15038727	CAL3	HC-METHANE-	CAL3		1/31/2022 11:34:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		10.3282735		10	0	0	2	2	0	103%	85	115	0%	
Ethene	A	ppm		10.1476990		10	0	0	2	2	0	101%	85	115	0%	
Methane	A	ppm		10.5936028		10	0	0	2	2	0	106%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038728	CAL4	HC-METHANE-	CAL4		1/31/2022 11:40:	1	R374783		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					
15038728	CAL4	HC-METHANE-	CAL4		1/31/2022 11:40:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		51.5359147		50	0	0	2	2	0	103%	85	115	0%	
Ethene	A	ppm		51.3647987		50	0	0	2	2	0	103%	85	115	0%	
Methane	A	ppm		52.2491534		50	0	0	2	2	0	104%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038729	CAL5	HC-METHANE-	CAL5		1/31/2022 11:45:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		93.9925939		100	0	0	2	2	0	94%	85	115	0%	
Ethene	A	ppm		93.8651881		100	0	0	2	2	0	94%	85	115	0%	
Methane	A	ppm		94.7521155		100	0	0	2	2	0	95%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038730	CAL6	HC-METHANE-	CAL6		1/31/2022 11:51:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		430.232311		500	0	0	2	2	0	86%	85	115	0%	
Ethene	A	ppm		434.391804		500	0	0	2	2	0	87%	85	115	0%	
Methane	A	ppm		451.873058		500	0	0	2	2	0	90%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038731	CAL7	HC-METHANE-	CAL7		1/31/2022 12:02:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		921.191920		1000	0	0	2	2	0	92%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038732	CCV	HC-METHANE-	CCV		1/31/2022 12:08:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		101.850441		100	0	0	2	2	0	102%	85	115	0%	
Ethene	A	ppm		102.540441		100	0	0	2	2	0	103%	85	115	0%	
Methane	A	ppm		103.796714		100	0	0	2	2	0	104%	85	115	0%	

Inst ID FID-HeadSpace

Blank,cts	STD ID	Sample	Response	Date/Time	Run Id
0	#12173	1000000			
Decimal	Conc ppm	Area Counts	Factor		
Amnt, Injtd/ 300uL	Equivalent				
0.0000025	2.5	4459	1783.6	1/31/2022 11:22	19265
0.000005	5	7681	1536.2	1/31/2022 11:28	19266
0.00001	10	16564	1656.4	1/31/2022 11:34	19267
0.00005	50	81696	1633.92	1/31/2022 11:40	19268
0.0001	100	148153	1481.53	1/31/2022 11:45	19269
0.0005	500	706542	1413.084	1/31/2022 11:51	19270
0.001	1000	1440362	1440.362	1/31/2022 12:02	19271

StdDev 133.7196
 Avg RF 1563.585
 %RSD 8.552118



Methane MW= 16.04

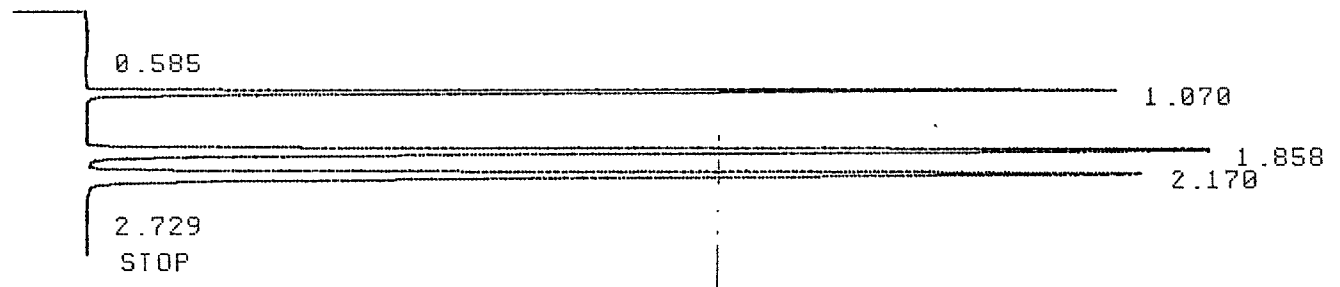
[PPM]	Calculated Recoveries		
	Area Cnts	PPM	% recovery
2.5	4459	2.851779464	114.07%
5	7681	4.912428361	98.25%
10	16564	10.59360283	105.94%
50	81696	52.24915341	104.50%
100	148153	94.75211547	94.75%
500	706542	451.873058	90.37%
1000	1440362	921.1919201	92.12%

Sample	Area Count	Dilution	Temp (°C)	Concentration (ppm)	Date/Time	Analyst	Sample	Test Code	Analyte
CCV	162019	1	20	103.6201967	1/31/2022 10:32	jdw	CCV	HC-METHANE-CCV	Methane
CCV	321986	1	20	103.5193612	1/31/2022 10:32	jdw	CCV	HC-METHANE-CCV	Ethane
CCV	325807	1	20	103.057616	1/31/2022 10:32	jdw	CCV	HC-METHANE-CCV	Ethane
LCS	157624	1	20	100.8093488	1/31/2022 10:37	jdw	LCS	HC-METHANE-CCV	Methane
LCS	309612	1	20	99.54108708	1/31/2022 10:37	jdw	LCS	HC-METHANE-CCV	Ethane
LCS	313898	1	20	99.29062161	1/31/2022 10:37	jdw	LCS	HC-METHANE-CCV	Ethane
MBLK	432	1	20	0.27628812	1/31/2022 11:15	jdw	MBLK	HC-METHANE-CCV	Methane
MBLK	0	1	20	0	1/31/2022 11:15	jdw	MBLK	HC-METHANE-CCV	Ethane
MBLK	0	1	20	0	1/31/2022 11:15	jdw	MBLK	HC-METHANE-CCV	Ethane
CAL1	4459	1	20	2.851779464	1/31/2022 11:22	jdw	CAL1	HC-METHANE-CCV	Methane
CAL1	8492	1	20	2.73020074	1/31/2022 11:22	jdw	CAL1	HC-METHANE-CCV	Ethane
CAL1	8589	1	20	2.716828871	1/31/2022 11:22	jdw	CAL1	HC-METHANE-CCV	Ethane
CAL2	7681	1	20	4.912428361	1/31/2022 11:28	jdw	CAL2	HC-METHANE-CCV	Methane
CAL2	16236	1	20	5.219917477	1/31/2022 11:28	jdw	CAL2	HC-METHANE-CCV	Ethane
CAL2	16815	1	20	5.318835425	1/31/2022 11:28	jdw	CAL2	HC-METHANE-CCV	Ethane
CAL3	16564	1	20	10.59360283	1/31/2022 11:34	jdw	CAL3	HC-METHANE-CCV	Methane
CAL3	32125	1	20	10.32827352	1/31/2022 11:34	jdw	CAL3	HC-METHANE-CCV	Ethane
CAL3	32081	1	20	10.14769904	1/31/2022 11:34	jdw	CAL3	HC-METHANE-CCV	Ethane
CAL4	81696	1	20	52.24915341	1/31/2022 11:40	jdw	CAL4	HC-METHANE-CCV	Methane
CAL4	160297	1	20	51.53591474	1/31/2022 11:40	jdw	CAL4	HC-METHANE-CCV	Ethane
CAL4	162385	1	20	51.36479873	1/31/2022 11:40	jdw	CAL4	HC-METHANE-CCV	Ethane
CAL5	148153	1	20	94.75211547	1/31/2022 11:45	jdw	CAL5	HC-METHANE-CCV	Methane
CAL5	292354	1	20	93.99259386	1/31/2022 11:45	jdw	CAL5	HC-METHANE-CCV	Ethane
CAL5	296746	1	20	93.86518806	1/31/2022 11:45	jdw	CAL5	HC-METHANE-CCV	Ethane
CAL6	706542	1	20	451.873058	1/31/2022 11:51	jdw	CAL6	HC-METHANE-CCV	Methane
CAL6	1338192	1	20	430.2323114	1/31/2022 11:51	jdw	CAL6	HC-METHANE-CCV	Ethane
CAL6	1373289	1	20	434.3918039	1/31/2022 11:51	jdw	CAL6	HC-METHANE-CCV	Ethane
CAL7	1440362	1	20	921.1919201	1/31/2022 12:02	jdw	CAL7	HC-METHANE-CCV	Methane
CCV	162295	1	20	103.7967141	1/31/2022 12:08	jdw	CCV	HC-METHANE-CCV	Methane
CCV	316795	1	20	101.8504408	1/31/2022 12:08	jdw	CCV	HC-METHANE-CCV	Ethane
CCV	324172	1	20	102.5404411	1/31/2022 12:08	jdw	CCV	HC-METHANE-CCV	Ethane

Calibration: Methane, Ethane, Ethene
JDW
1/31/2022

*ID 12173-500X-CCU

* RUN #19262 JAN 31, 2022 10:32:58
START



RUN# 19262 JAN 31, 2022 10:32:58

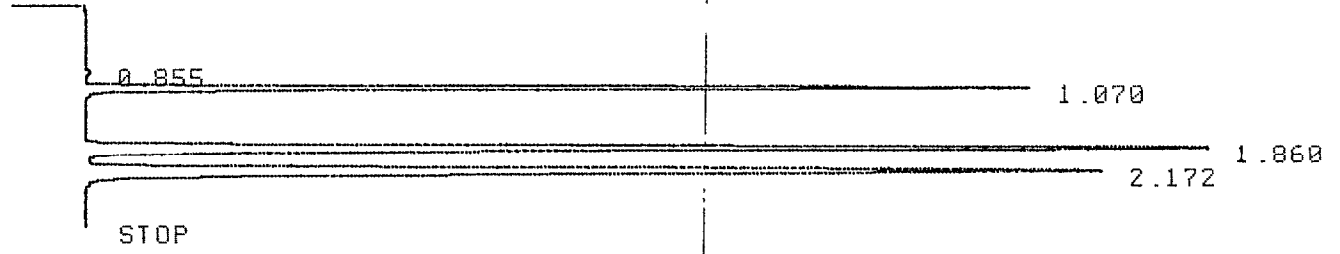
IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.585	553	PP	.073	.06822
1.070	162019	PB	.046	19.98594
1.858	325807	UU	.076	40.19010
2.170	321986	UU	.089	39.71875
2.729	300	PV	.045	.03701

TOTAL AREA= 810665
MUL FACTOR=1.00000E+00

*ID 10711-LCS

* RUN #19263 JAN 31, 2022 10:37:36
START



RUN# 19263 JAN 31, 2022 10:37:36

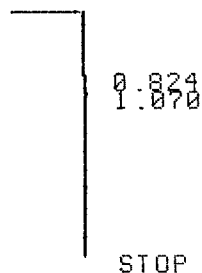
IDENTIFIER : 10711-LCS
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.855	975	PV	.051	.12466
1.070	157624	PB	.049	20.15372
1.860	313898	BB	.076	40.13482
2.172	309612	BV	.089	39.58680

TOTAL AREA= 782109
MUL FACTOR=1.00000E+00

*ID MB

* RUN #19264 JAN 31, 2022 11:15:04
START



RUN# 19264 JAN 31, 2022 11:15:04

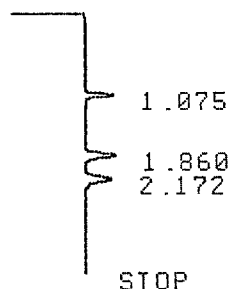
IDENTIFIER : MB
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	432	UU	.049	100.00000

TOTAL AREA= 432
MUL FACTOR=1.0000E+00

*ID CAL1-2.5PPM

* RUN #19265 JAN 31, 2022 11:22:01
START



RUN# 19265 JAN 31, 2022 11:22:01

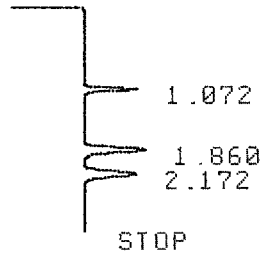
IDENTIFIER : CAL1-2.5PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.075	4891	UU	.048	22.26014
1.860	8589	UP	.079	39.09067
2.172	8492	UP	.091	38.64918

TOTAL AREA= 21972
MUL FACTOR=1.0000E+00

*ID CAL2-5PPM

* RUN #19266 JAN 31, 2022 11:28:46
START



RUN# 19266 JAN 31, 2022 11:28:46

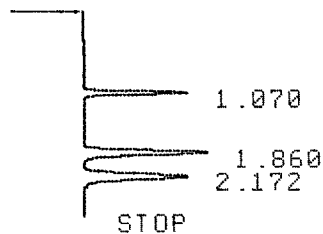
IDENTIFIER : CAL2-5PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.072	8113	BP	.045	19.70897
1.860	16815	PV	.078	40.84880
2.172	16236	UP	.089	39.44222

TOTAL AREA= 41164
MUL FACTOR=1.0000E+00

*ID CAL3-10PPM

* RUN #19267 JAN 31, 2022 11:34:40
START



RUN# 19267 JAN 31, 2022 11:34:40

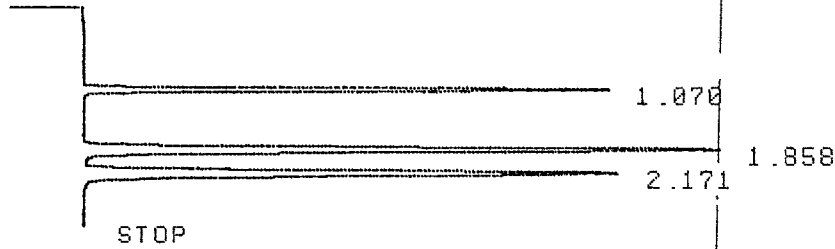
IDENTIFIER : CAL3-10PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	16996	PP	.047	20.93052
1.860	32081	PV	.075	39.50765
2.172	32125	UP	.089	39.56184

TOTAL AREA= 81202
MUL FACTOR=1.0000E+00

*ID CAL4-50PPM

* RUN #19268 JAN 31, 2022 11:40:12
START



RUN# 19268 JAN 31, 2022 11:40:12

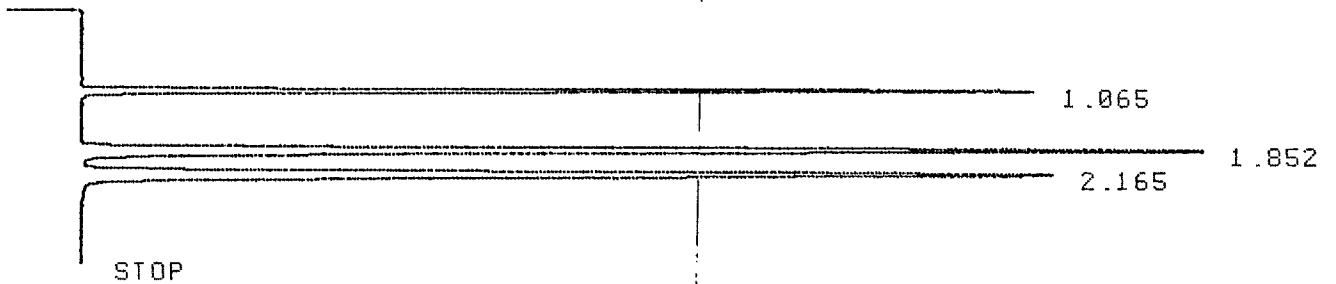
IDENTIFIER : CAL4-50PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	82128	PB	.045	20.28803
1.858	162385	PB	.075	40.11387
2.171	160297	BB	.088	39.59808

TOTAL AREA= 404810
MUL FACTOR=1.0000E+00

*ID CAL5-100PPM

* RUN #19269 JAN 31, 2022 11:45:49
START



RUN# 19269 JAN 31, 2022 11:45:49

IDENTIFIER : CAL5-100PPM
AREA%

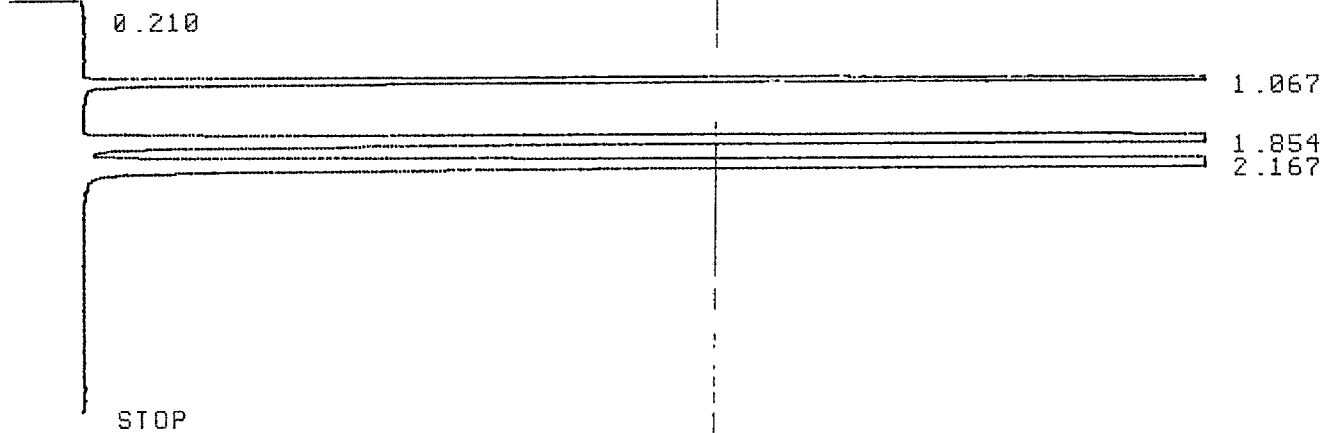
RT	AREA	TYPE	WIDTH	AREA%
1.065	148585	PB	.046	20.14206
1.852	296746	UU	.075	40.22666
2.165	292354	UP	.088	39.63126

TOTAL AREA= 737685
MUL FACTOR=1.0000E+00

~~*ID CAL5-500PPM~~ *30w*
1/31/2022

*ID CAL6-500PPM

* RUN #19270 JAN 31, 2022 11:51:57
START



RUN# 19270 JAN 31, 2022 11:51:57

IDENTIFIER : CAL6-500PPM
AREA%

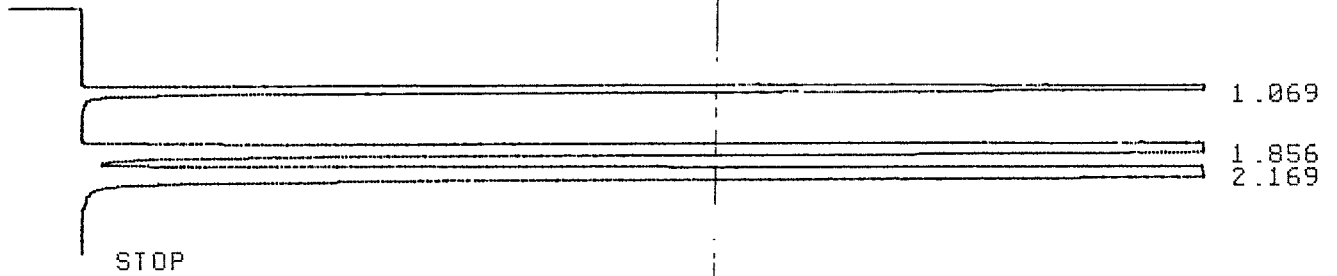
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1.067	706974	BB	.047	20.68110
1.854	1373289	PB	.078	40.17278
2.167	1338192	BB	.091	39.14610

TOTAL AREA=3418454
MUL FACTOR=1.0000E+00

*

*ID CAL7-1000PPM

* RUN #19271 JAN 31, 2022 12:02:20
START



RUN# 19271 JAN 31, 2022 12:02:20

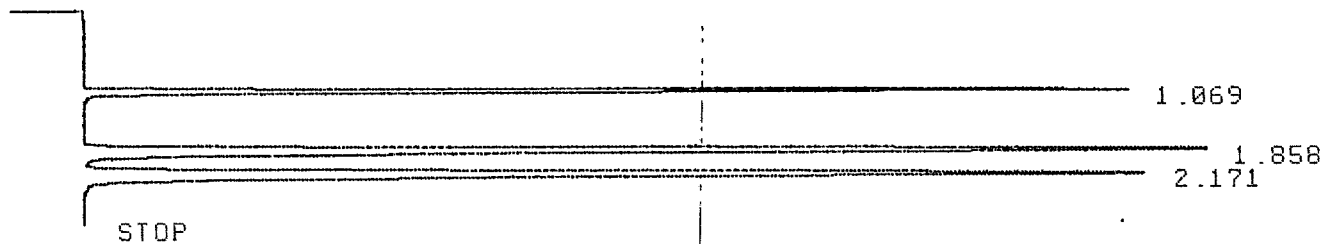
IDENTIFIER : CAL7-1000PPM
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.069	1440794	PB	.048	22.10318
1.856	2645432	PB	.082	40.58349
2.169	2432269	BB	.097	37.31334

TOTAL AREA=6518493
MUL FACTOR=1.0000E+00

*ID 12173-500X-CCU

* RUN #19272 JAN 31, 2022 12:08:57
START



RUN# 19272 JAN 31, 2022 12:08:57

IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.069	162295	PB	.045	20.20449
1.858	324172	PB	.075	40.35604
2.171	316795	BB	.088	39.43858

TOTAL AREA= 803262
MUL FACTOR=1.0000E+00

Energy Laboratories Inc

ANALYTICAL RUN Summary

17-Mar-22

Run ID FID-HEADSPACE_220311B

Run Start Date: 3/11/2022
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					
15084940	CCV	HC-METHANE-	CCV		3/11/2022 3:36:0	1	R376018		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		97.2112076		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					
15084941	LCS	HC-METHANE-	LCS		3/11/2022 3:40:0	1	R376018		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		94.7828141		100	0	0	2	2	0	95%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15084942	LCSD	HC-METHANE-	LCSD		3/11/2022 3:44:0	1	R376018		0	2E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		93.9258093		100	0	94.782814	2	2	0	94%	85	115	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15084943	MBLK	HC-METHANE-	MBLK		3/11/2022 3:58:0	1	R376018		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					
15084944	B22030502-001	HC-METHANE-	SAMP		3/11/2022 4:13:0	1	R376018		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					
15084945	B22030502-005	HC-METHANE-	SAMP		3/11/2022 4:19:0	1	R376018		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					
15084946	B22030502-011	HC-METHANE-	SAMP		3/11/2022 4:23:0	1	R376018		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00196294			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					
15084947	B22030502-011	HC-METHANE-	DUP		3/11/2022 4:31:0	1	R376018		0	2E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00206910			0	0.0019629	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					
15084948	B22030502-015	HC-METHANE-	SAMP		3/11/2022 4:39:0	1	R376018		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					
15084949	B22030502-016	HC-METHANE-	SAMP		3/11/2022 4:43:0	1	R376018		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					
15084950	B22030502-020	HC-METHANE-	SAMP		3/11/2022 4:48:0	1	R376018		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					
15084951	B22030502-031	HC-METHANE-	SAMP		3/11/2022 4:56:0	1	R376018		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					
15084952	B22030502-035	HC-METHANE-	SAMP		3/11/2022 5:02:0	1	R376018		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					
15084953	B22030586-001	HC-METHANE-	SAMP		3/11/2022 5:06:0	1	R376018		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					
15084954	B22030586-006	HC-METHANE-	SAMP		3/11/2022 5:11:0	1	R376018		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					
15084955	B22030586-007	HC-METHANE-	SAMP		3/11/2022 5:16:0	1	R376018		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					
15084956	B22030586-011	HC-METHANE-	SAMP		3/11/2022 5:20:0	1	R376018		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					
15084957	CCV	HC-METHANE-	CCV		3/11/2022 5:24:0	1	R376018		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		102.473473		100	0	0	2	2	0	102%	85	115	0%	

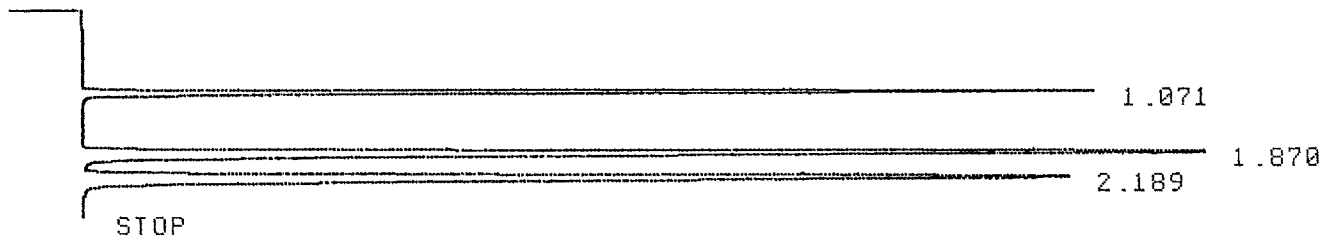
Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	151998	1	22	97.21120765	3/11/2022 15:36	jdw	CCV	HC-METHANE-CCV	Methane		
LCS	148201	1	22	94.78281415	3/11/2022 15:40	jdw	LCS	HC-METHANE-CCV	Methane		
LCSD	146861	1	22	93.92580933	3/11/2022 15:44	jdw	LCSD	HC-METHANE-CCV	Methane		
MBLK	617	1	22	9.07E-05	3/11/2022 15:58	jdw	MBLK	HC-METHANE-W	Methane	10	32
B22030502-001H	1109	1	22	7.23E-05	3/11/2022 16:13	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-005A	811	1	22	2.85E-05	3/11/2022 16:19	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-011H	13967	1	22	1.96E-03	3/11/2022 16:23	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-011HDUP	14689	1	22	2.07E-03	3/11/2022 16:31	jdw	DUP	HC-METHANE-W	Methane	10	32
B22030502-015A	1092	1	22	6.98E-05	3/11/2022 16:39	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-016H	674	1	22	8.38E-06	3/11/2022 16:43	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-020A	942	1	22	4.78E-05	3/11/2022 16:48	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-031H	723	1	22	1.56E-05	3/11/2022 16:56	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030502-035A	1049	1	22	6.35E-05	3/11/2022 17:02	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030586-001H	0	1	22	-9.07E-05	3/11/2022 17:06	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030586-006A	816	1	22	2.93E-05	3/11/2022 17:11	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030586-007H	956	1	22	4.98E-05	3/11/2022 17:16	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22030586-011A	898	1	22	4.13E-05	3/11/2022 17:20	jdw	SAMP	HC-METHANE-W	Methane	10	32
CCV	160226	1	22	1.02E+02	3/11/2022 17:24	jdw	CCV	HC-METHANE-CCV	Methane		

JJW
3/11/2022

*

*ID 12173-500X-CCU

* RUN #19594 MAR 11, 2022 15:36:13
START



RUN# 19594 MAR 11, 2022 15:36:13

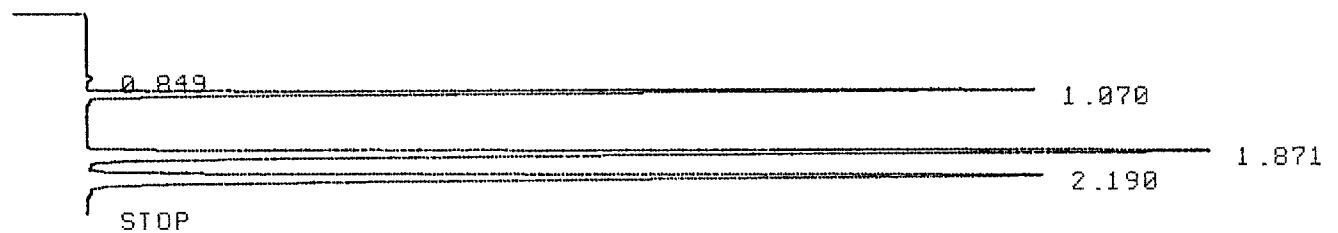
IDENTIFIER : 12173-500X-C
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.071	151998	PB	.044	20.24794
1.870	302100	BB	.075	40.24330
2.189	296586	BB	.088	39.50875

TOTAL AREA= 750684
MUL FACTOR=1.0000E+00

*ID 10711-LCS

* RUN #19595 MAR 11, 2022 15:40:11
START



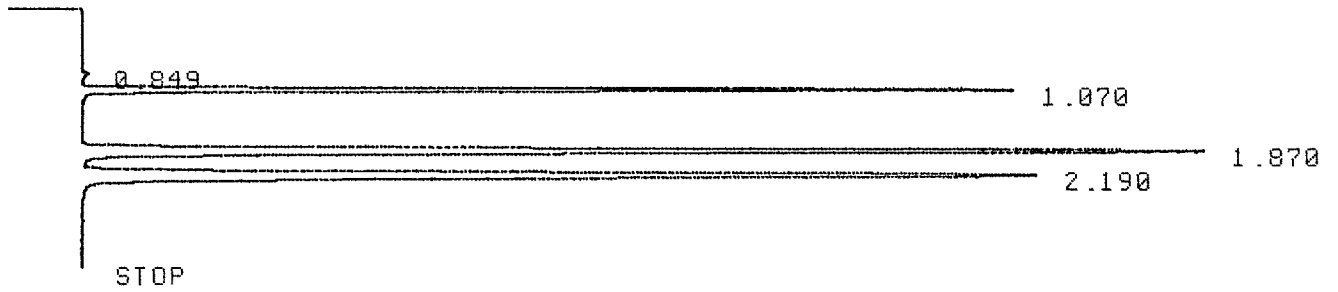
IDENTIFIER : 10711-LCS
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.849	1018	UU	.046	.13918
1.070	148201	PB	.046	20.26220
1.871	294356	UB	.075	40.24467
2.190	287841	BB	.088	39.35394

TOTAL AREA= 731416
MUL FACTOR=1.0000E+00

*ID 10711-LCSD

* RUN #19596 MAR 11, 2022 15:44:06
START



RUN# 19596 MAR 11, 2022 15:44:06

IDENTIFIER : 10711-LCSD
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.849	1055	UP	.047	.14490
1.070	146861	PB	.046	20.17103
1.870	292886	BB	.075	40.22723
2.190	287277	BP	.088	39.45685

TOTAL AREA= 728079
MUL FACTOR=1.0000E+00

*

*ID MB

* RUN #19597 MAR 11, 2022 15:58:57
START

—
|
} 1.069
|
: 2.510
|

RUN# 19597 MAR 11, 2022 15:58:57

IDENTIFIER : MB
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.069	617	BP	.047	100.00000

TOTAL AREA= 617
MUL FACTOR=1.0000E+00

*ID 502-1H

* RUN #19598 MAR 11, 2022 16:13:36
START

—
|
} 1.075
|
STOP

RUN# 19598 MAR 11, 2022 16:13:36

IDENTIFIER : 502-1H
AREA%

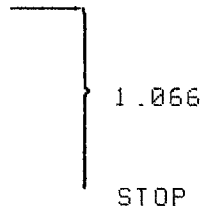
RT	AREA	TYPE	WIDTH	AREA%
1.075	1109	UP	.066	100.00000

TOTAL AREA= 1109
MUL FACTOR=1.0000E+00

*ID 502-5A

* RUN #19599 MAR 11, 2022 16:19:05

START



RUN# 19599 MAR 11, 2022 16:19:05

IDENTIFIER : 502-5A

AREA%

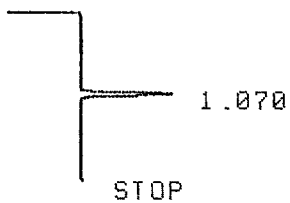
RT	AREA	TYPE	WIDTH	AREA%
1.066	811	UU	.057	100.00000

TOTAL AREA= 811
MUL FACTOR=1.0000E+00

*ID 502-11H

* RUN #19600 MAR 11, 2022 16:23:11

START



RUN# 19600 MAR 11, 2022 16:23:11

IDENTIFIER : 502-11H

AREA%

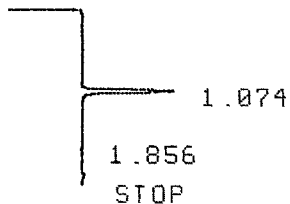
RT	AREA	TYPE	WIDTH	AREA%
1.070	13967	BU	.044	100.00000

TOTAL AREA= 13967
MUL FACTOR=1.0000E+00

STOP

*ID 502-11H-DUP

* RUN #19601 MAR 11, 2022 16:31:32
START



RUN# 19601 MAR 11, 2022 16:31:32

IDENTIFIER : 502-11H-DUP
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.074	14689	PU	.046	96.66362
1.056	507	PU	.058	3.33640

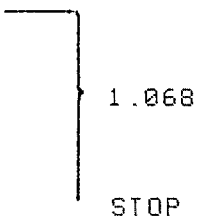
TOTAL AREA= 15196
MUL FACTOR=1.0000E+00

* PLOT



*ID 502-15A

* RUN #19602 MAR 11, 2022 16:39:32
START



RUN# 19602 MAR 11, 2022 16:39:32

IDENTIFIER : 502-15A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.068				

TOTAL AREA= 1092
MUL FACTOR=1.0000E+00

*ID 502-16H

* RUN #19603 MAR 11, 2022 16:43:55
START

┌───
│
│ } 0.637
│ } 1.085
│
└─── STOP

RUN# 19603 MAR 11, 2022 16:43:55

IDENTIFIER : 502-16H

AREA%

RT	AREA	TYPE	WIDTH	AREA%
.637	320	PB	.049	32.19317
1.085	674	BP	.053	67.80685

TOTAL AREA= 994
MUL FACTOR=1.0000E+00

*ID 502-20A

* RUN #19604 MAR 11, 2022 16:48:08
START

┌───
│
│ } 1.078
│
└─── STOP

RUN# 19604 MAR 11, 2022 16:48:08

IDENTIFIER : 502-20A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.078	942	PP	.057	100.00000

TOTAL AREA= 942
MUL FACTOR=1.0000E+00

*ID 502-31H

* RUN #19605 MAR 11, 2022 16:52:22
START

```

┌───┐
│   │
│   │ 1.022
│   │ 1.336
│   │
└───┘
STOP

```

RUN# 19605 MAR 11, 2022 16:52:22

IDENTIFIER : 502-31H
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.022	381	PU	.039	54.19632
1.336	322	PU	.043	45.80370

*Do not use
repeat run
JDW 3/11/2022*

TOTAL AREA= 703
MUL FACTOR=1.0000E+00

*ID ~~502-35H~~ *JDW 3/11/2022*

*ID 502-31H

* RUN #19606 MAR 11, 2022 16:56:56
START

```

┌───┐
│   │
│   │ 1.078
│   │
└───┘
STOP

```

RUN# 19606 MAR 11, 2022 16:56:56

IDENTIFIER : 502-31H
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.078	723	PU	.071	100.00000

TOTAL AREA= 723
MUL FACTOR=1.0000E+00

*ID 502-35A

* RUN #19607 MAR 11, 2022 17:02:30

START

A chromatogram showing a single sharp peak. The x-axis represents time in minutes. A vertical line marks the peak at 1.072 minutes. The peak is labeled with its retention time, 1.072. The baseline is flat and labeled 'STOP' at the end.

RUN# 19607 MAR 11, 2022 17:02:30

IDENTIFIER : 502-35A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.072	1049	PP	.071	100.00000

TOTAL AREA= 1049
MUL FACTOR=1.0000E+00

*ID 586-1H

* RUN #19608 MAR 11, 2022 17:06:56

START

A chromatogram showing a flat baseline with no peaks. The x-axis represents time in minutes. The baseline is labeled 'STOP' at the end.

RUN# 19608 MAR 11, 2022 17:06:56

IDENTIFIER : 586-1H

NO RUN PEAKS STORED

*

*ID 586-6A

* RUN #19609 MAR 11, 2022 17:11:42
START

```
  |
  | } 0.355
  | } 0.896
  | } 1.069
  |
  | STOP
```

RUN# 19609 MAR 11, 2022 17:11:42

IDENTIFIER : 586-6A
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.355	463	PV	.069	24.02698
.896	648	PV	.089	33.62739
1.069	816	UV	.052	42.34562

TOTAL AREA= 1927
MUL FACTOR=1.0000E+00

*ID 586-7H

* RUN #19610 MAR 11, 2022 17:16:21
START

```
  |
  | } 0.881
  | } 1.070
  |
  | STOP
```

RUN# 19610 MAR 11, 2022 17:16:21

IDENTIFIER : 586-7H
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.881	412	PV	.047	30.11696
1.070	956	UV	.059	69.88307

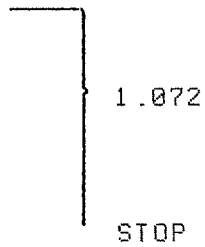
TOTAL AREA= 1368
MUL FACTOR=1.0000E+00

*

*ID 586-11A

* RUN #19611 MAR 11, 2022 17:20:22

START



RUN# 19611 MAR 11, 2022 17:20:22

IDENTIFIER : 586-11A

AREA%

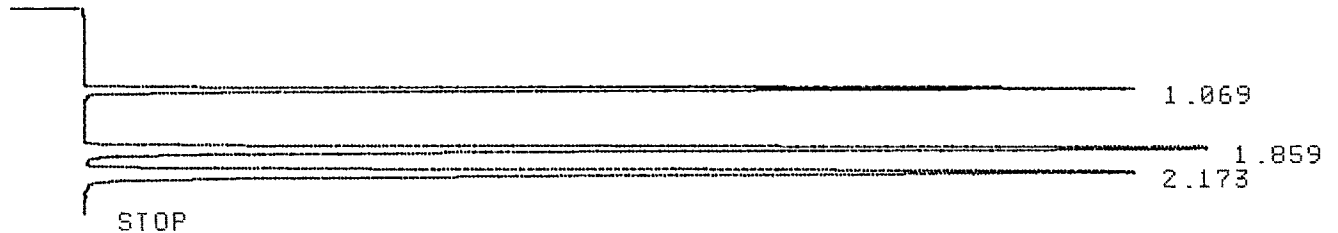
RT	AREA	TYPE	WIDTH	AREA%
1.072	898	UP	.056	100.00000

TOTAL AREA= 898
MUL FACTOR=1.0000E+00

*ID 12173-500X-CCU

* RUN #19612 MAR 11, 2022 17:24:45

START



RUN# 19612 MAR 11, 2022 17:24:45

IDENTIFIER : 12173-500X-C

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.069	160226	BB	.045	20.17965
1.859	319552	PB	.074	40.24594
2.173	314220	BB	.087	39.57440

TOTAL AREA= 793998
MUL FACTOR=1.0000E+00

Energy Laboratories Inc

Spike LOG

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

Type: Primary
 BY:
 Status: New

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

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

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL

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

CERTIFICATE OF ANALYSIS

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

Ref Po# 3008099

14 LITER DISPOSABLE

LOT NUMBER: 109-96-04454

COMPONENT

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: _____

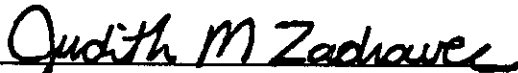
3 Multi-Component Gas Standard in Nitrogen

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 $\pm 2\%$. NIST traceable by weights or gaseous standards.



Judy Zadravec, Chemist

10/19/2018

DATE

Energy Laboratories Inc

Spike LOG

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

Type: Primary
 BY:
 Status: New

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

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

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL

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

CERTIFICATE OF ANALYSIS

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

Ref Po# 3005062

14 LITER DISPOSABLE

LOT NUMBER: 109-86-03507

COMPONENT

CONCENTRATION

methane	100.0	ppm
ethane	100.0	ppm
ethylene	100.0	ppm
nitrogen	Bal	

ITEM NUMBER: GMT2677328TC

CGA: 160

PSIG: 240

FILL DATE: 08/08/18

EXPIRATION DATE: 08/09/22

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

Judith M Zadravec

Judy Zadravec, Chemist

8/14/2018

DATE

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