

Data Path : Z:\SVOASRV\HPCHEM1\BNA E\DATA\BE070519\
 Data File : BE100386.D
 Acq On : 5 Jul 2019 17:58
 Operator : JU/SJ
 Sample : K3561-02
 Misc :
 ALS Vial : 13 Sample Multiplier: 1

Instrument :
 BNA_E
 ClientSampleId :
 PST-012-B227-062419

Manual Integrations
 APPROVED

mohammad
 7/8/2019 2:13:55 PM

Quant Time: Jul 06 00:46:22 2019

Quant Method : Z:\SVOASRV\HPCHEM1\BNA E\METHODS\8270-SIM-BE062819.M

Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION

QLast Update : Fri Jun 28 14:06:53 2019

Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.62	152	709	0.40	ng	-0.02
7) Naphthalene-d8	10.42	136	2313	0.40	ng	-0.03
13) Acenaphthene-d10	14.30	164	1795	0.40	ng	-0.01
19) Phenanthrene-d10	17.04	188	5657	0.40	ng	-0.01
27) Chrysene-d12	21.23	240	7561	0.40	ng	-0.01
34) Perylene-d12	23.65	264	9179	0.40	ng	-0.01

System Monitoring Compounds

4) 2-Fluorophenol	5.19	112	730	0.40	ng	-0.02
5) Phenol-d6	6.82	99	882	0.37	ng	-0.02
8) Nitrobenzene-d5	8.80	82	663	0.29	ng	-0.03
11) 2-Methylnaphthalene-d10	12.02	152	1604	0.37	ng	-0.03
14) 2,4,6-Tribromophenol	15.80	330	550	0.44	ng	-0.03
15) 2-Fluorobiphenyl	12.91	172	2650	0.38	ng	-0.03
25) Fluoranthene-d10	19.09	212	21943	0.27	ng	-0.01
29) Terphenyl-d14	19.68	244	4619	0.29	ng	-0.02

Target Compounds

						Qvalue
9) Naphthalene	10.47	128	1903	0.075	ng	# 91
12) 2-Methylnaphthalene	12.11	142	128	0.029	ng	# 77
16) Acenaphthylene	14.02	152	817	0.095	ng	95
17) Acenaphthene	14.36	154	228	0.047	ng	86
18) Fluorene	15.34	166	406	0.056	ng	# 97
23) Phenanthrene	17.08	178	12216	0.891	ng	99
24) Anthracene	17.17	178	2016	0.163	ng	99
26) Fluoranthene	19.11	202	36346	1.664	ng	100
28) Pyrene	19.48	202	37499	1.873	ng	96
30) Benzo(a)anthracene	21.22	228	28488	1.146	ng	92
31) Chrysene	21.27	228	23332	0.935	ng	96
32) Bis(2-ethylhexyl)phthalate	21.14	149	7742	0.163	ng	# 99
33) Indeno(1,2,3-cd)pyrene	26.20	276	14861	0.450	ng	# 97
35) Benzo(b)fluoranthene	22.91	252	27990	1.125	ng	98
36) Benzo(k)fluoranthene	22.95	252	12748m	0.459	ng	
37) Benzo(a)pyrene	23.54	252	21677m	0.869	ng	
38) Dibenzo(a,h)anthracene	26.21	278	3586	0.138	ng	# 69
39) Benzo(a,h,i)perylene	26.99	276	14271	0.533	ng	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

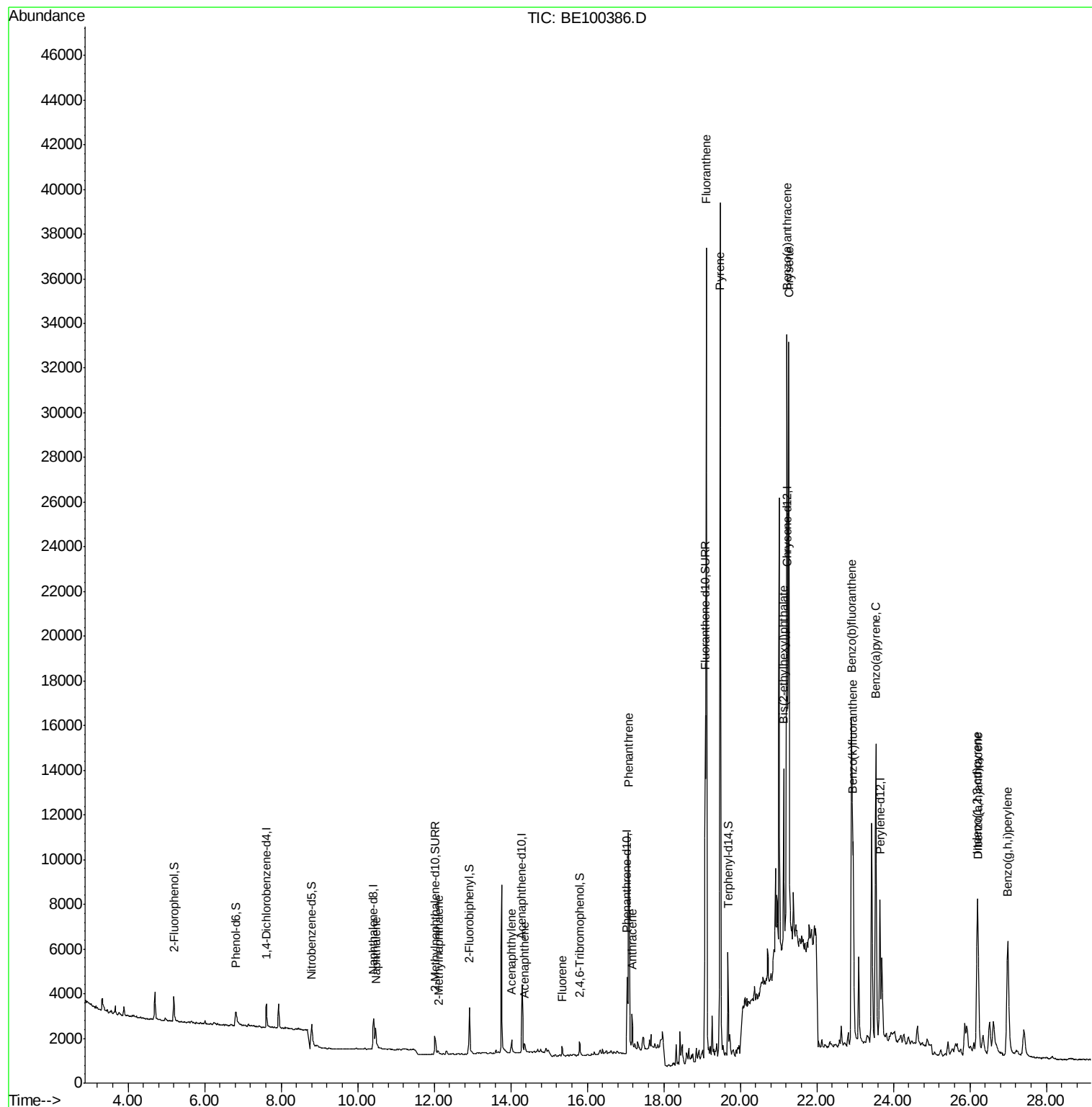
Data Path : Z:\SVOASRV\HPCHEM1\BNA E\DATA\BE070519\
Data File : BE100386.D
Acq On : 5 Jul 2019 17:58
Operator : JU/SJ
Sample : K3561-02
Misc :
ALS Vial : 13 Sample Multiplier: 1

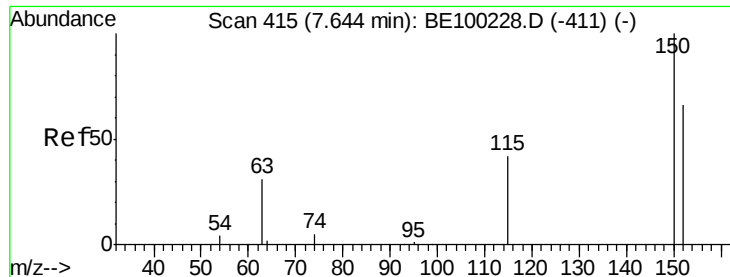
Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM

Quant Time: Jul 06 00:46:22 2019
Quant Method : Z:\SVOASRV\HPCHEM1\BNA E\METHODS\8270-SIM-BE062819.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Fri Jun 28 14:06:53 2019
Response via : Initial Calibration





#1

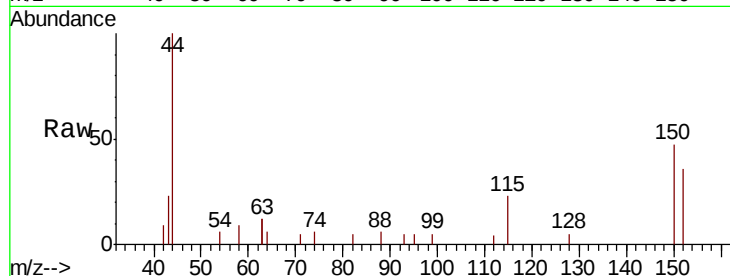
1,4-Dichlorobenzene-d4
Concen: 0.400 ng
RT: 7.62 min Scan# 413
Delta R.T. -0.02 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
152	100		
150	128.6	114.5	171.7
115	62.9	57.1	85.7

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM

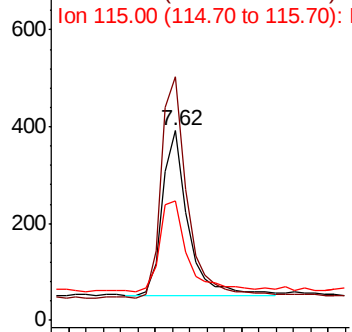


Abundance

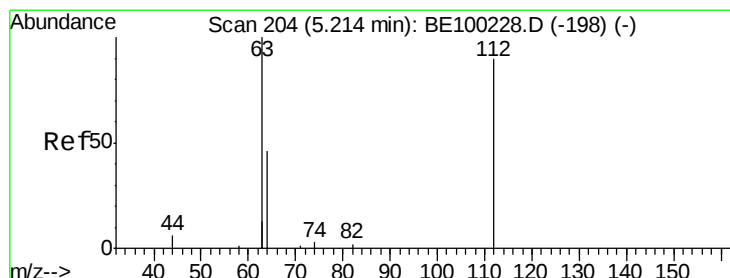
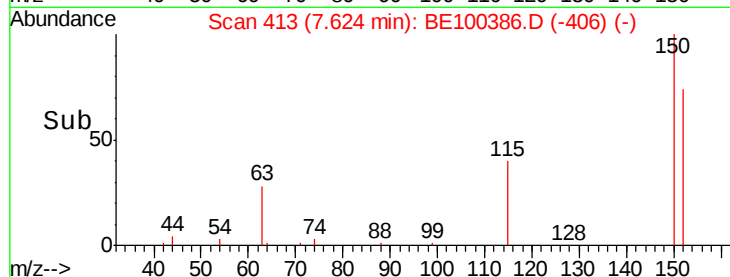
Ion 152.00 (151.70 to 152.70): E

Ion 150.00 (149.70 to 150.70): E

Ion 115.00 (114.70 to 115.70): E



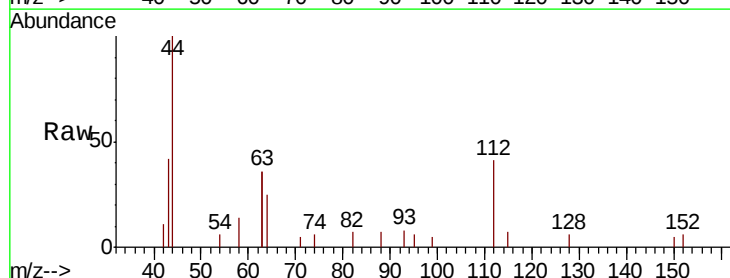
Time-->



#4

2-Fluorophenol
Concen: 0.404 ng
RT: 5.19 min Scan# 202
Delta R.T. -0.02 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
112	100		
64	55.1	39.4	59.0
63	154.1	104.5	156.7

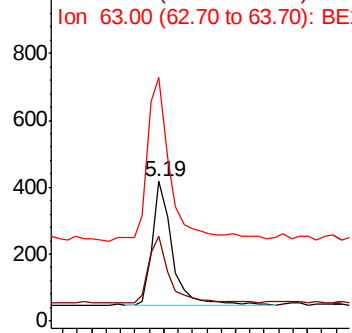


Abundance

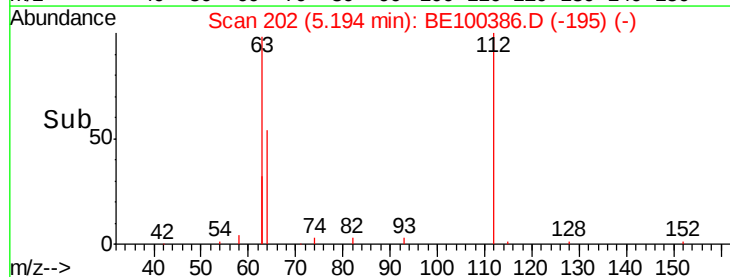
Ion 112.00 (111.70 to 112.70): E

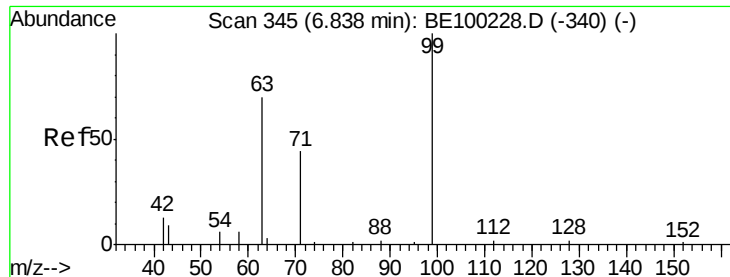
Ion 64.00 (63.70 to 64.70): BE1

Ion 63.00 (62.70 to 63.70): BE1



Time-->





#5

Phenol-d6

Concen: 0.371 ng

RT: 6.82 min Scan# 343

Delta R.T. -0.02 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Instrument :

BNA_E

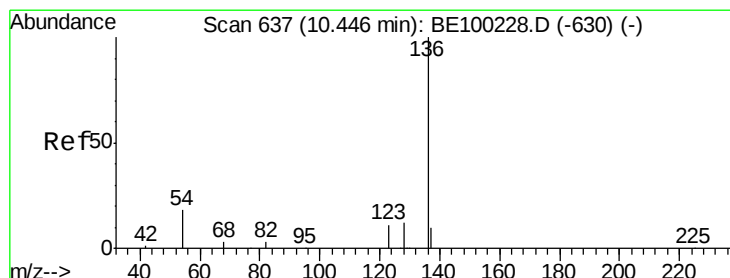
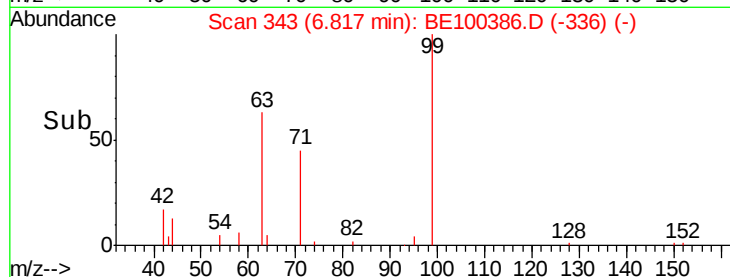
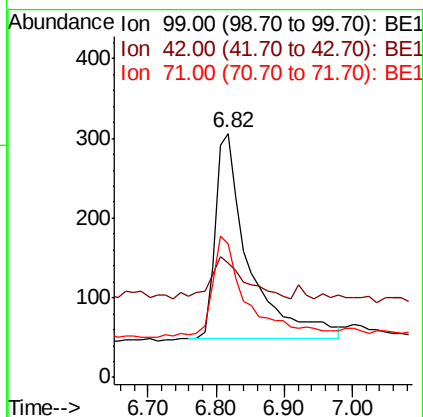
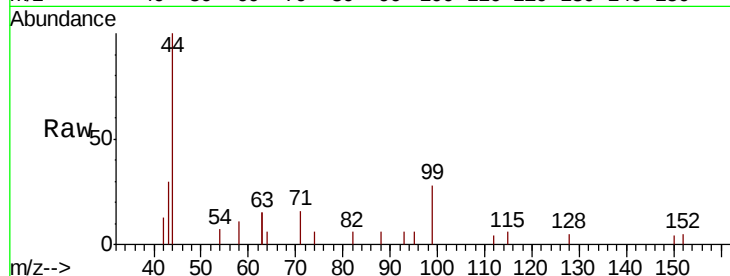
ClientSampleId :

PST-012-B227-062419

Tot Ion:	99	Resp:	882
Ion	Ratio	Lower	Upper
99	100		
42	20.9	11.2	16.8#
71	46.5	37.2	55.8

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM



#7

Naphthalene-d8

Concen: 0.400 ng

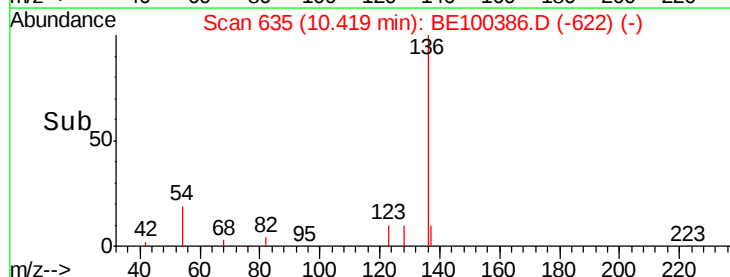
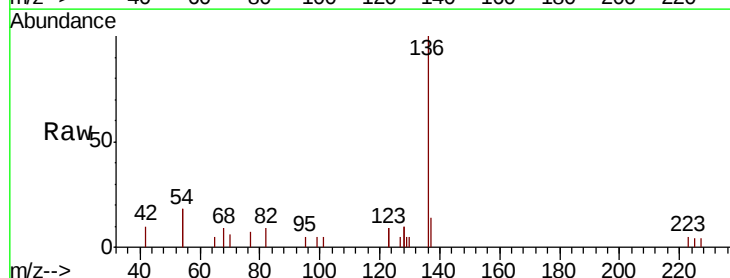
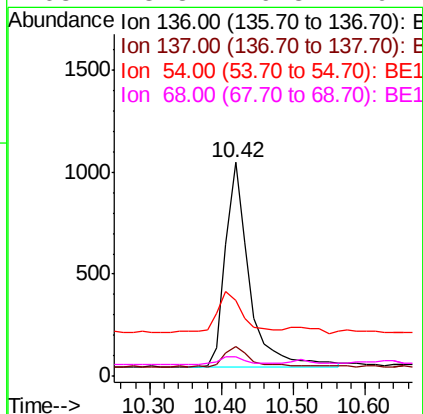
RT: 10.42 min Scan# 635

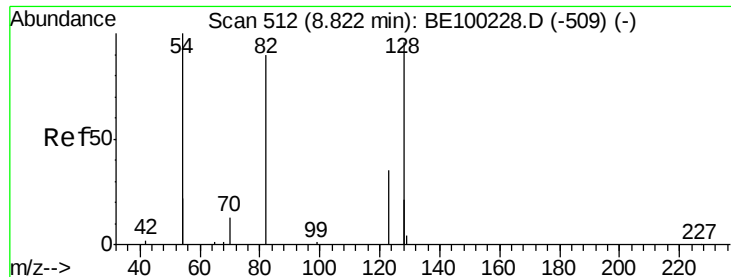
Delta R.T. -0.03 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Tgt Ion:	136	Resp:	2313
Ion	Ratio	Lower	Upper
136	100		
137	13.9	11.8	17.8
54	35.5	27.7	41.5
68	8.8	6.8	10.2





#8

Nitrobenzene-d5

Concen: 0.288 ng

RT: 8.80 min Scan# 510

Delta R.T. -0.03 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Instrument :

BNA_E

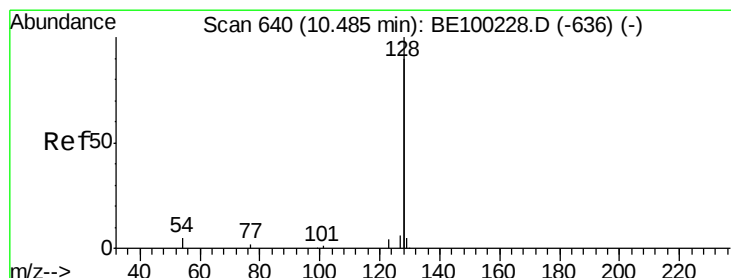
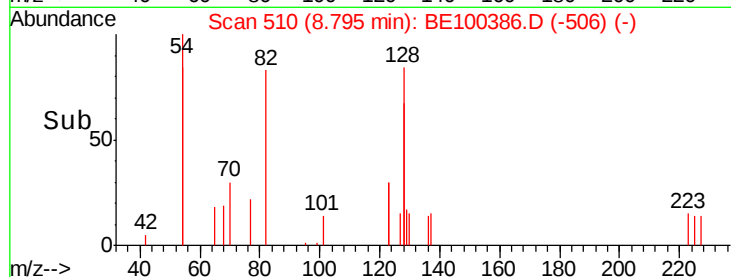
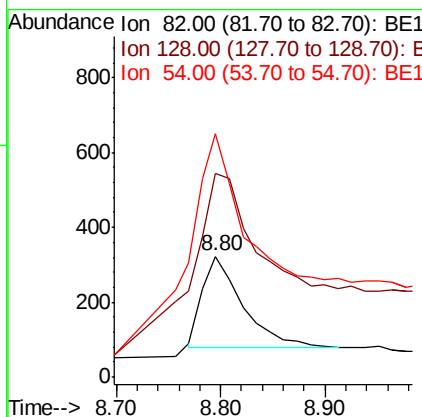
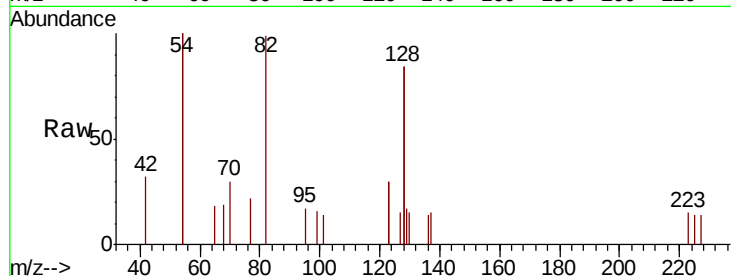
ClientSampleId :

PST-012-B227-062419

Tot Ion:	82	Resp:	663
Ion	Ratio	Lower	Upper
82	100		
128	168.4	140.9	211.3
54	201.2	146.2	219.2

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM



#9

Naphthalene

Concen: 0.075 ng

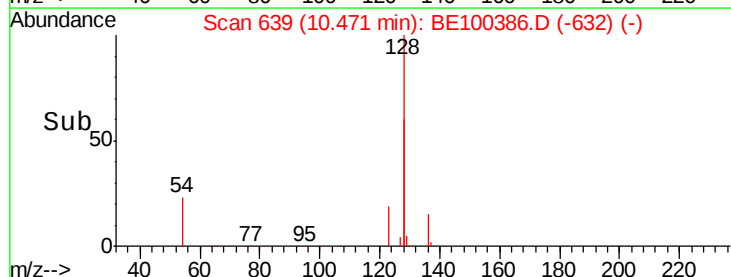
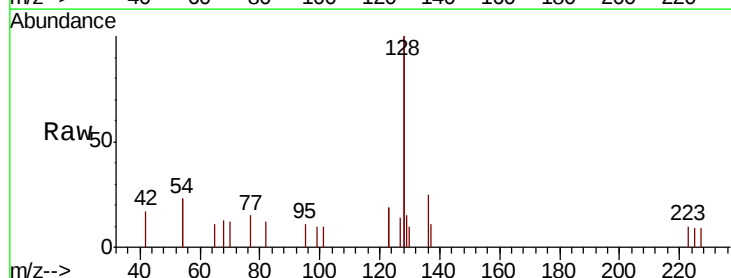
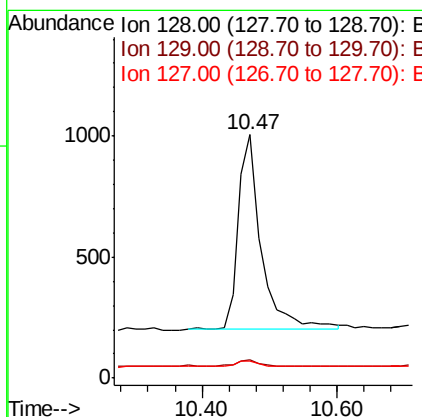
RT: 10.47 min Scan# 639

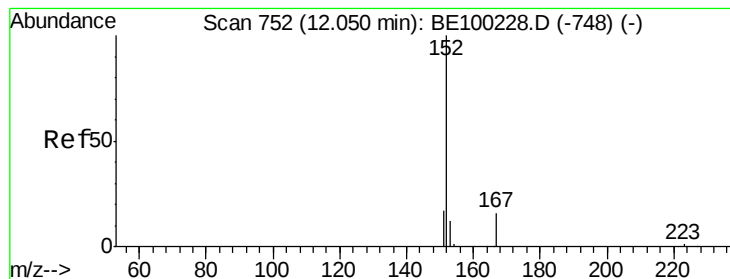
Delta R.T. -0.01 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Tgt Ion:	128	Resp:	1903
Ion	Ratio	Lower	Upper
128	100		
129	7.6	3.0	4.6#
127	6.9	3.5	5.3#





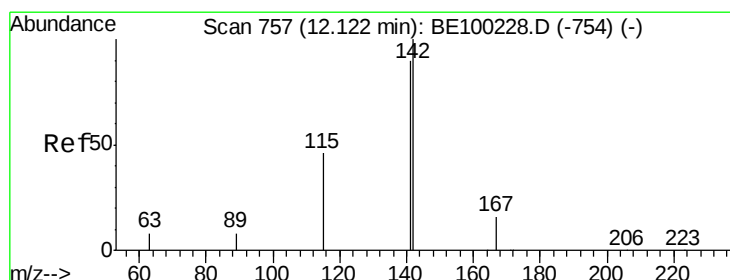
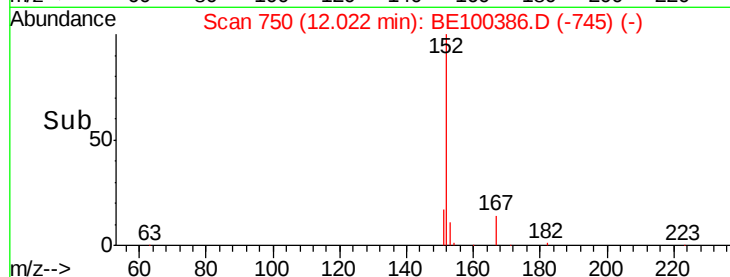
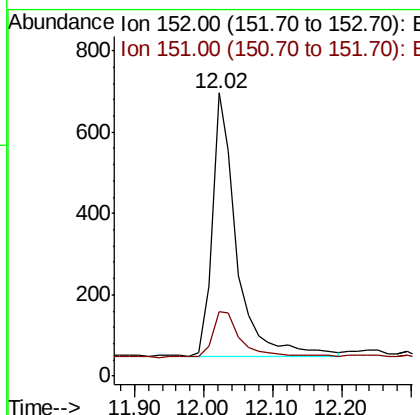
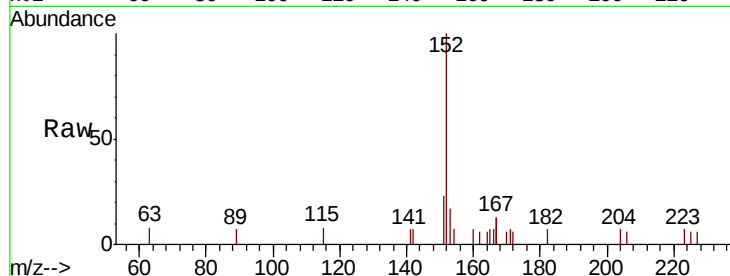
#11
2-Methylnaphthalene-d10
Concen: 0.369 ng
RT: 12.02 min Scan# 750
Delta R.T. -0.03 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
152	100		
151	19.3	15.1	22.7

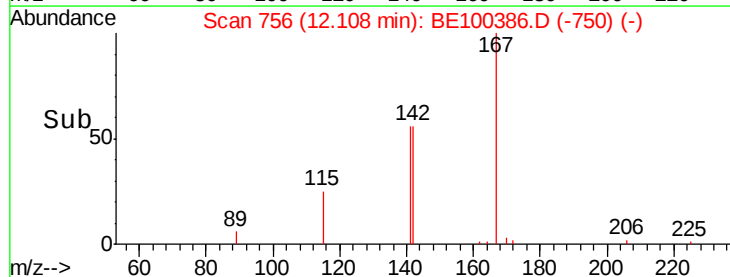
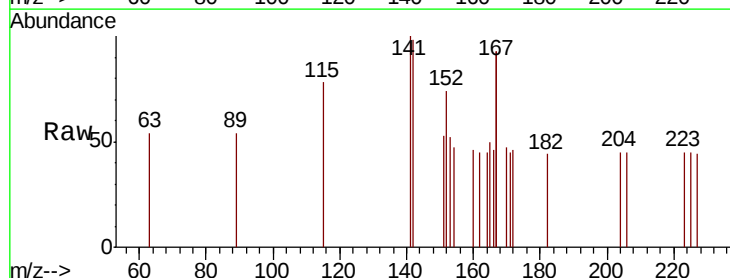
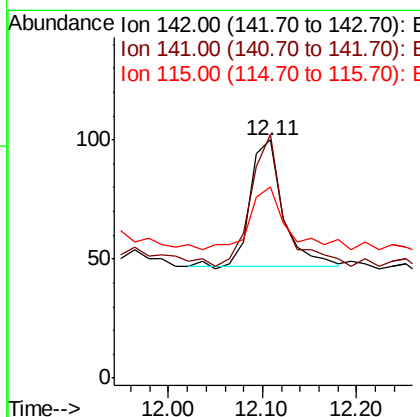
Manual Integrations
APPROVED

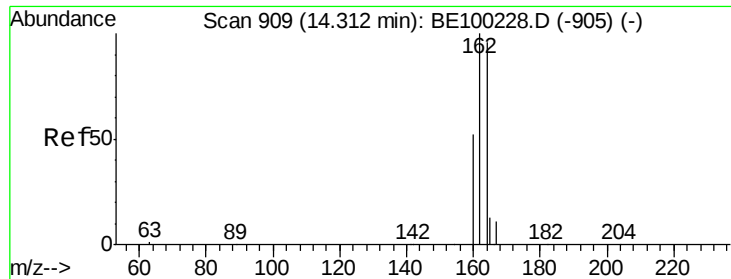
mohammad
7/8/2019 2:13:55 PM



#12
2-Methylnaphthalene
Concen: 0.029 ng
RT: 12.11 min Scan# 756
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
142	100		
141	102.0	72.4	108.6
115	80.0	40.4	60.6





#13

Acenaphthene-d10

Concen: 0.400 ng

RT: 14.30 min Scan# 908

Delta R.T. -0.01 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Instrument :

BNA_E

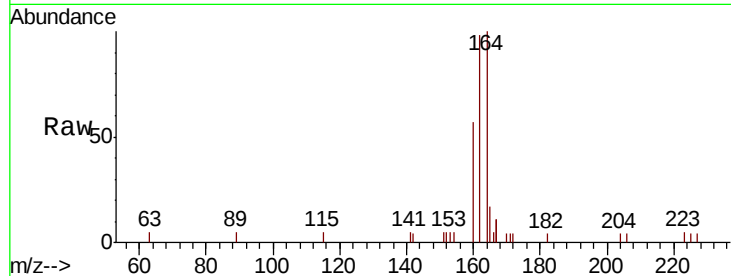
ClientSampleId :

PST-012-B227-062419

Tot Ion:	164	Resp:	1795
Ion	Ratio	Lower	Upper
164	100		
162	98.3	83.4	125.0
160	56.8	45.0	67.6

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM

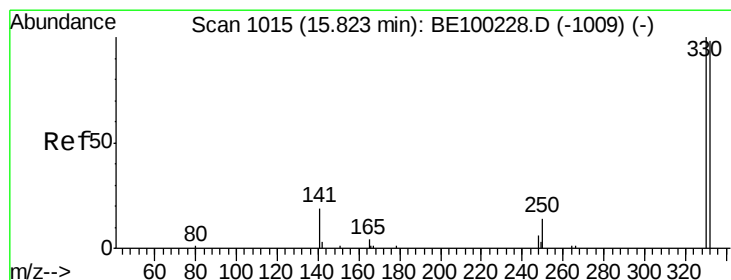
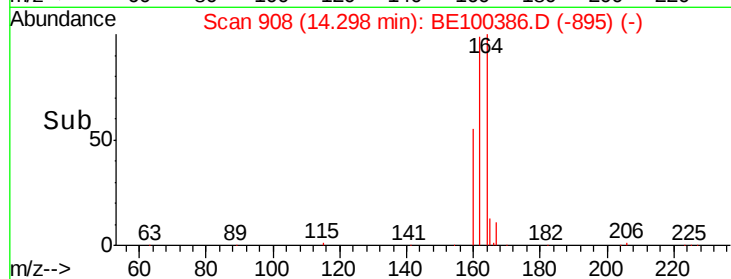
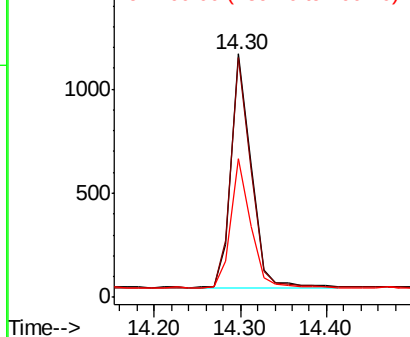


Abundance

Ion 164.00 (163.70 to 164.70): E

Ion 162.00 (161.70 to 162.70): E

Ion 160.00 (159.70 to 160.70): E



#14

2,4,6-Tribromophenol

Concen: 0.438 ng

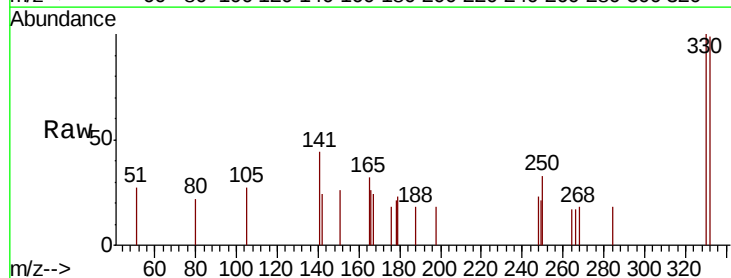
RT: 15.80 min Scan# 1013

Delta R.T. -0.03 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Tgt Ion:	330	Resp:	550
Ion	Ratio	Lower	Upper
330	100		
332	98.2	77.0	115.4
141	25.8	22.0	33.0

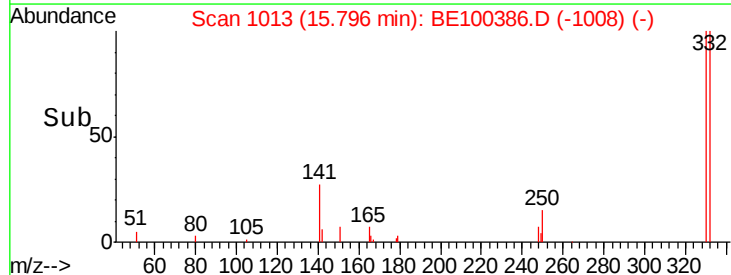
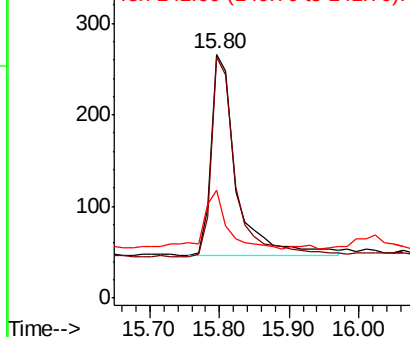


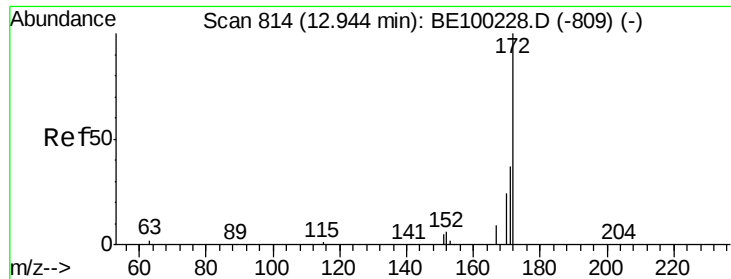
Abundance

Ion 330.00 (329.70 to 330.70): E

Ion 331.80 (331.50 to 332.50): E

Ion 141.00 (140.70 to 141.70): E





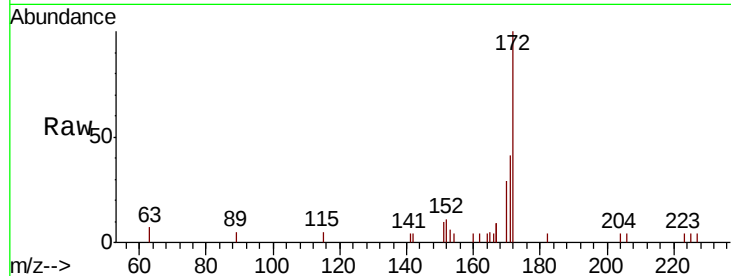
#15
2-Fluorobiphenyl
Concen: 0.379 ng
RT: 12.91 min Scan# 812
Delta R.T. -0.03 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
172	100		
171	40.6	31.9	47.9
170	28.5	22.2	33.2

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM

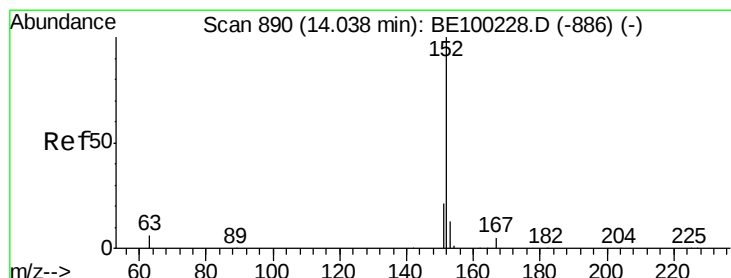
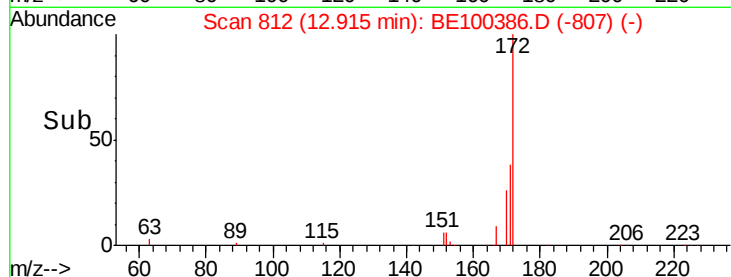
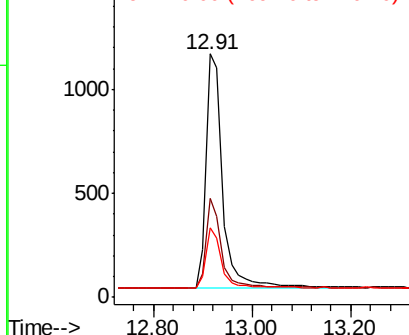


Abundance

Ion 172.00 (171.70 to 172.70): E

Ion 171.00 (170.70 to 171.70): E

Ion 170.00 (169.70 to 170.70): E



#16
Acenaphthylene
Concen: 0.095 ng
RT: 14.02 min Scan# 889
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

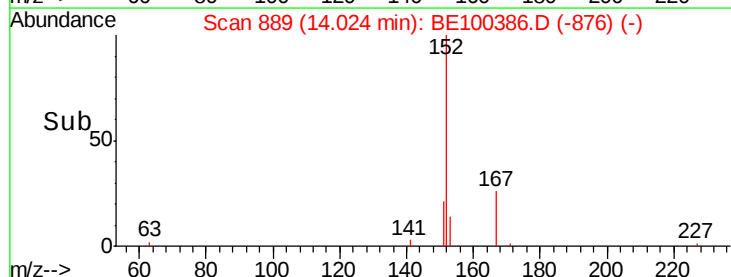
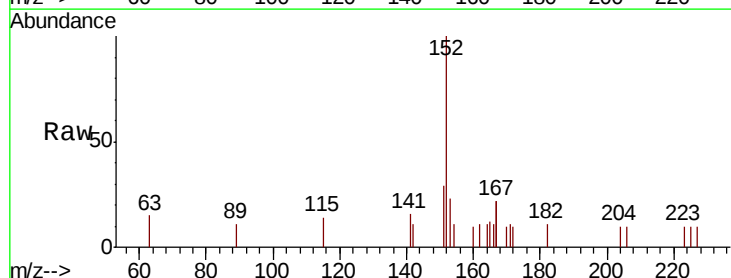
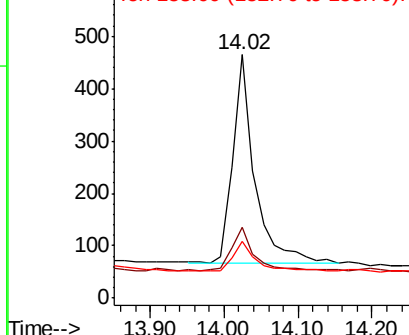
Tgt Ion	Ratio	Lower	Upper
152	100		
151	23.0	16.6	25.0
153	15.5	10.5	15.7

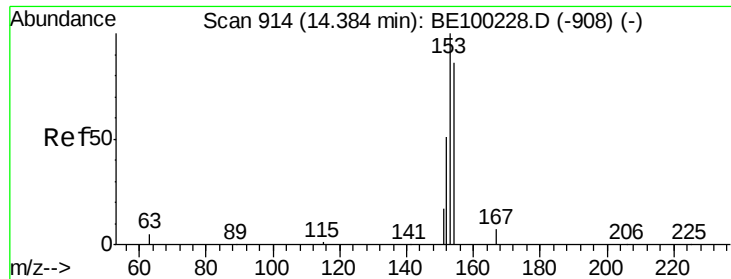
Abundance

Ion 152.00 (151.70 to 152.70): E

Ion 151.00 (150.70 to 151.70): E

Ion 153.00 (152.70 to 153.70): E





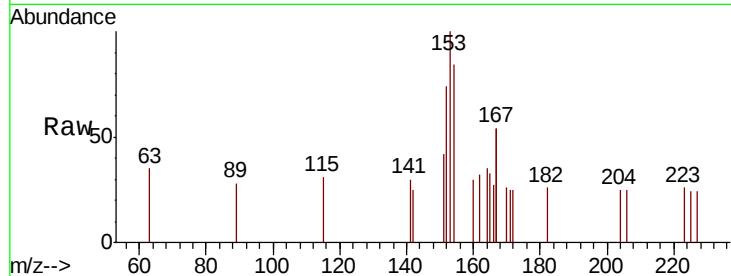
#17
Acenaphthene
Concen: 0.047 ng
RT: 14.36 min Scan# 912
Delta R.T. -0.03 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
154	100		
153	132.5	93.4	140.2
152	71.9	49.4	74.2

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM

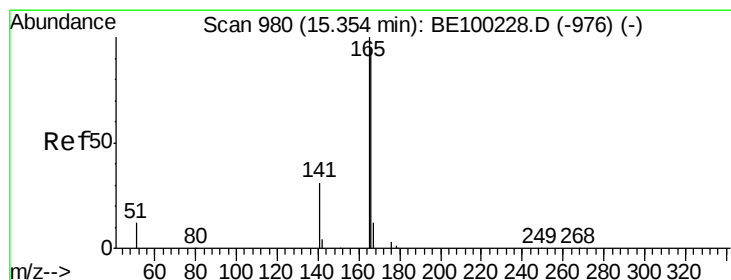
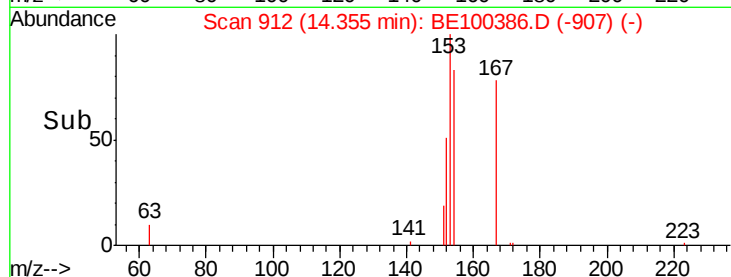
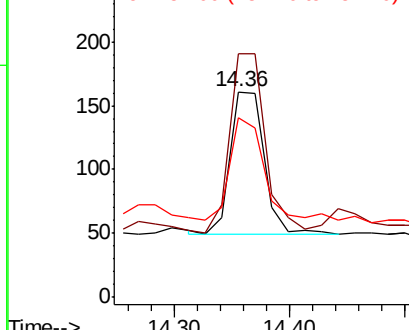


Abundance

Ion 154.00 (153.70 to 154.70): E

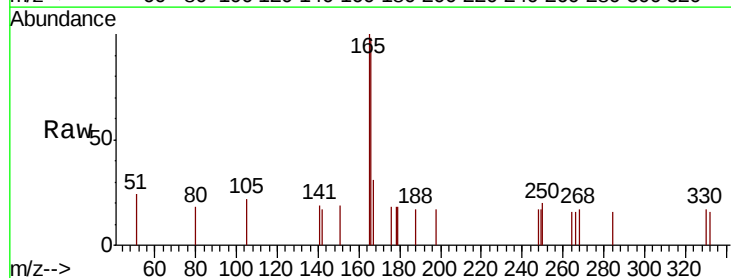
Ion 153.00 (152.70 to 153.70): E

Ion 152.00 (151.70 to 152.70): E



#18
Fluorene
Concen: 0.056 ng
RT: 15.34 min Scan# 979
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
166	100		
165	100.7	81.1	121.7
167	21.2	10.7	16.1#

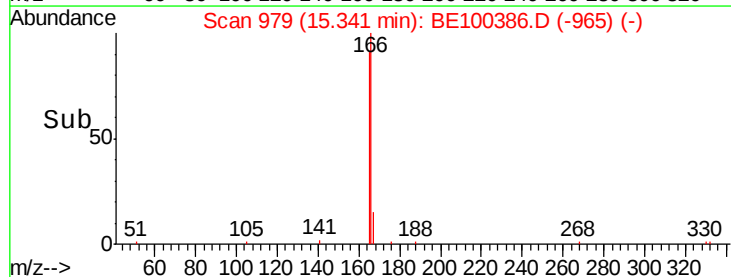
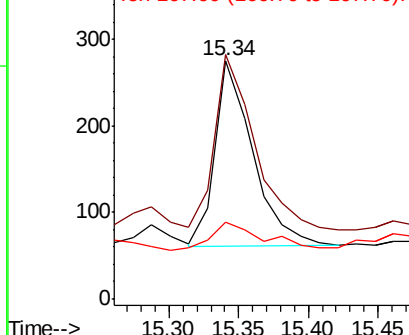


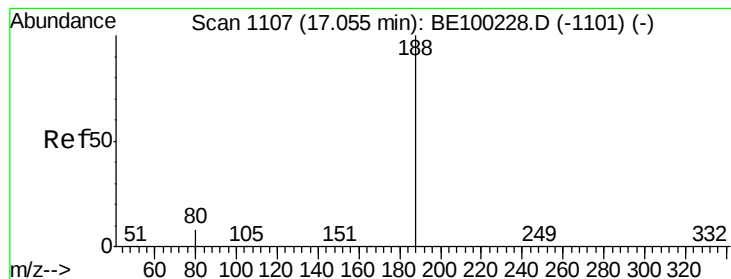
Abundance

Ion 166.00 (165.70 to 166.70): E

Ion 165.00 (164.70 to 165.70): E

Ion 167.00 (166.70 to 167.70): E





#19

Phenanthrene-d10

Concen: 0.400 ng

RT: 17.04 min Scan# 1106

Delta R.T. -0.01 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Instrument :

BNA_E

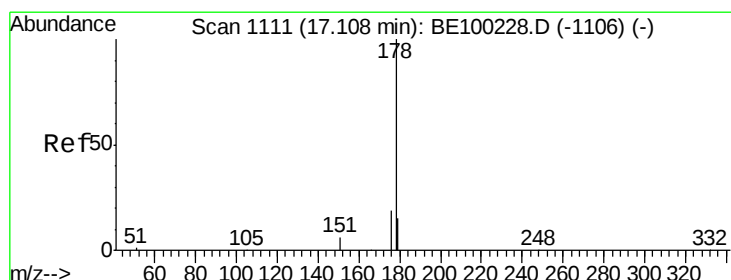
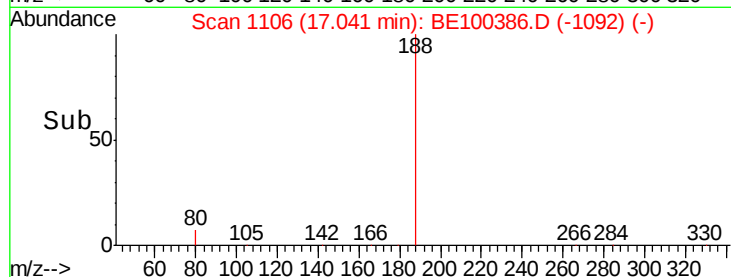
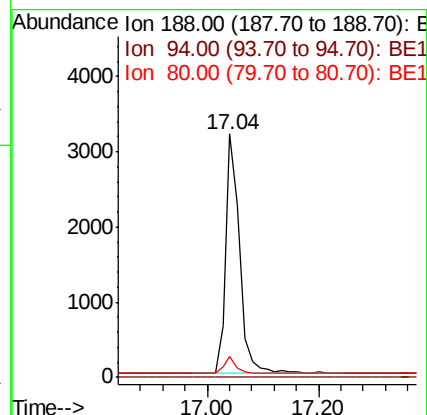
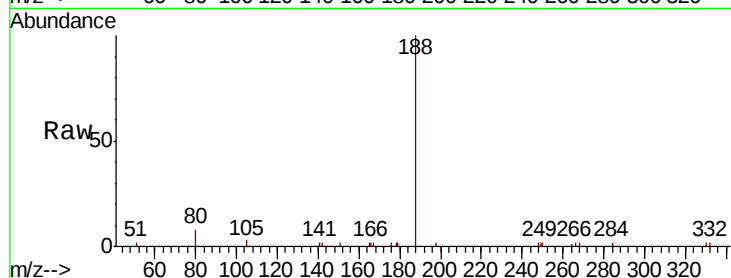
ClientSampleId :

PST-012-B227-062419

Tot Ion:	188	Resp:	5657
Ion Ratio	Lower	Upper	
188	100		
94	0.0	0.0	0.0
80	8.3	7.6	11.4

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM



#23

Phenanthrene

Concen: 0.891 ng

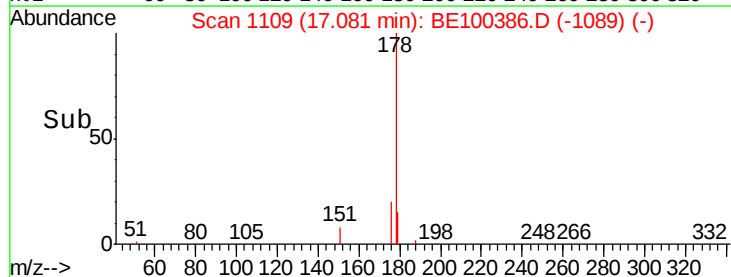
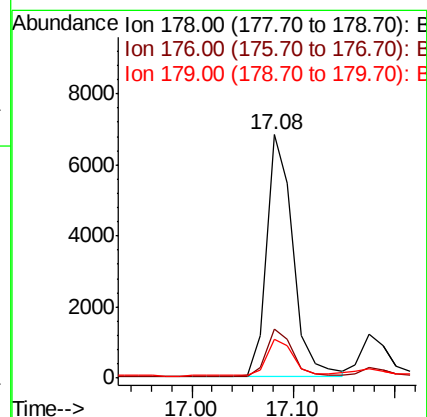
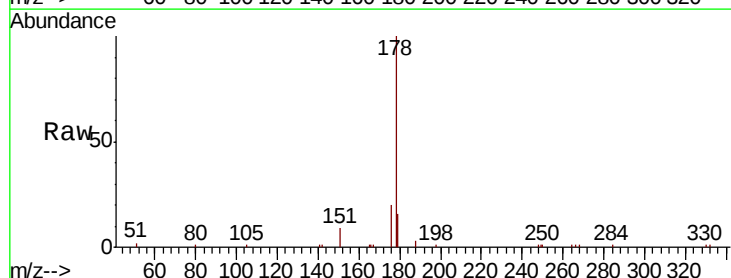
RT: 17.08 min Scan# 1109

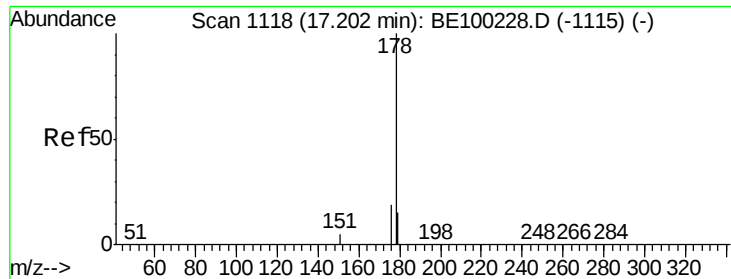
Delta R.T. -0.03 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Tgt Ion:	178	Resp:	12216
Ion Ratio	Lower	Upper	
178	100		
176	19.7	15.9	23.9
179	15.8	12.2	18.2





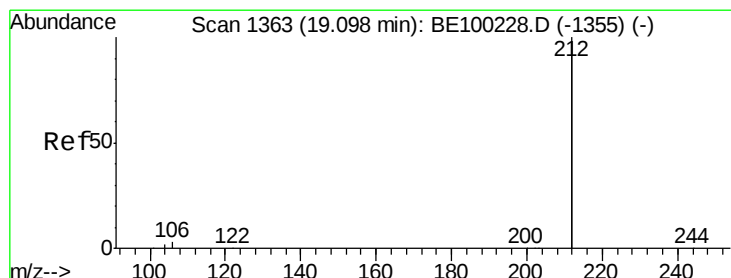
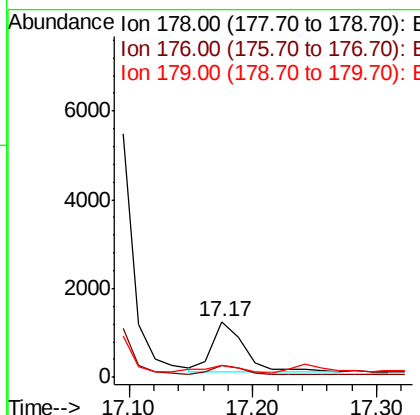
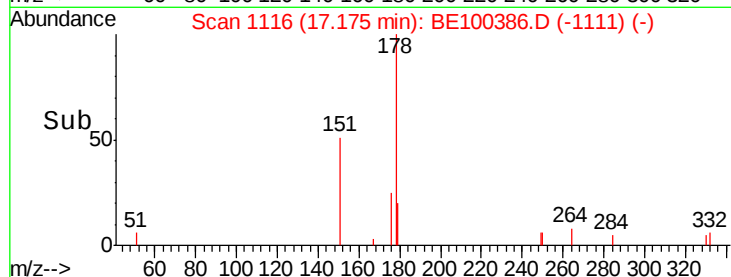
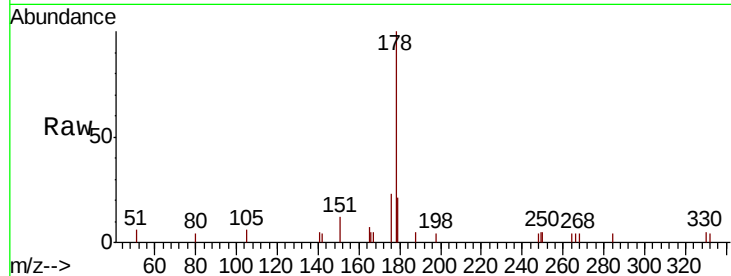
#24
 Anthracene
 Concen: 0.163 ng
 RT: 17.17 min Scan# 1116
 Delta R.T. -0.03 min
 Lab File: BE100386.D
 Acq: 5 Jul 2019 17:58

Instrument :
 BNA_E
 ClientSampleId :
 PST-012-B227-062419

Tot Ion:178	Resp:	2016
Ion Ratio	Lower	Upper
178	100	
176	18.3	15.3 22.9
179	15.5	12.2 18.2

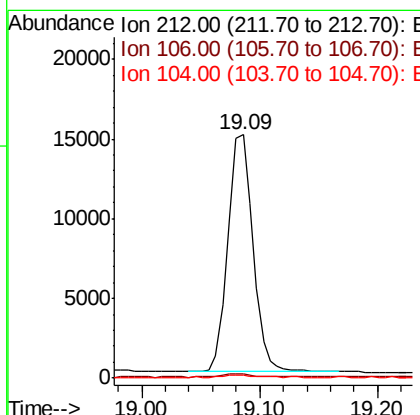
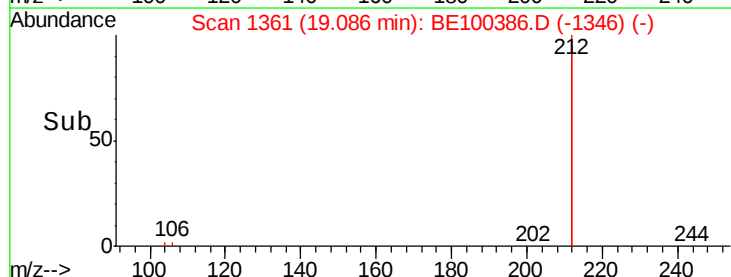
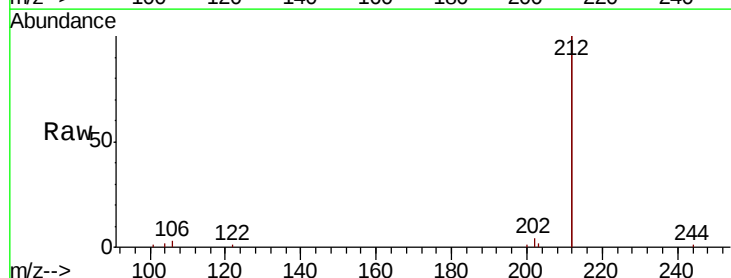
Manual Integrations
 APPROVED

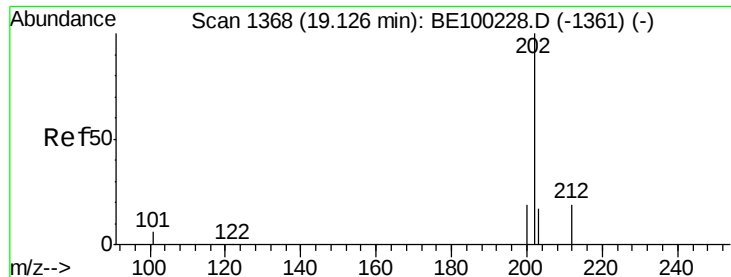
mohammad
 7/8/2019 2:13:55 PM



#25
 Fluoranthene-d10
 Concen: 0.267 ng
 RT: 19.09 min Scan# 1361
 Delta R.T. -0.01 min
 Lab File: BE100386.D
 Acq: 5 Jul 2019 17:58

Tgt Ion:212	Resp:	21943
Ion Ratio	Lower	Upper
212	100	
106	1.5	1.3 1.9
104	1.0	0.8 1.2





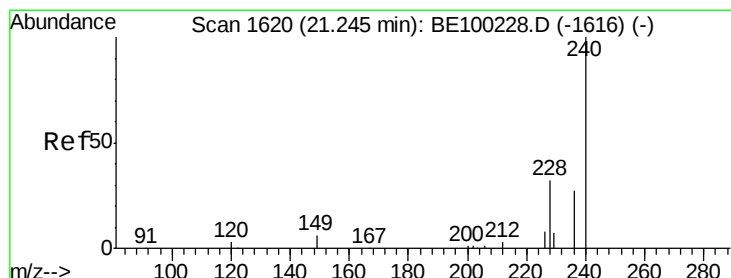
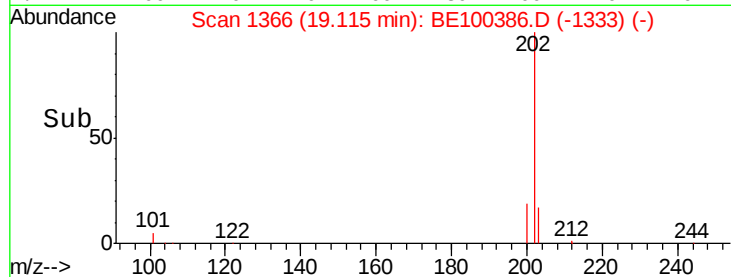
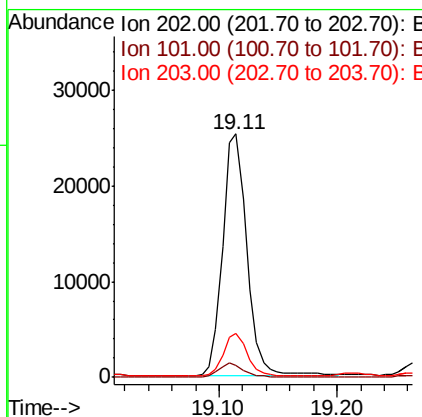
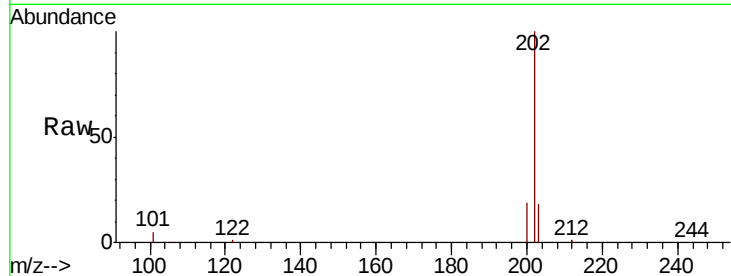
#26
Fluoranthene
Concen: 1.664 ng
RT: 19.11 min Scan# 1366
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
202	100		
101	5.3	4.6	7.0
203	17.1	13.7	20.5

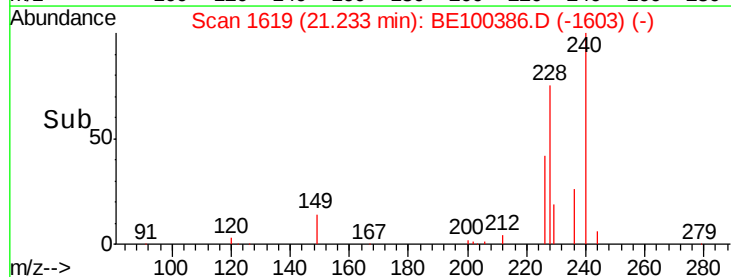
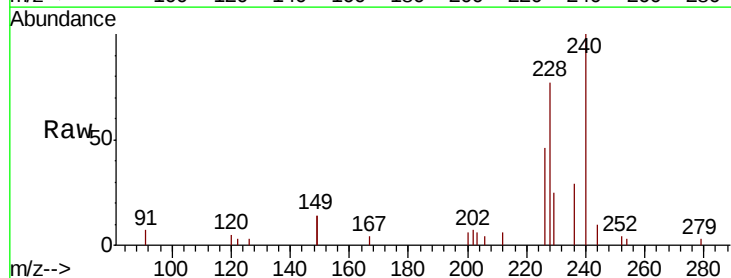
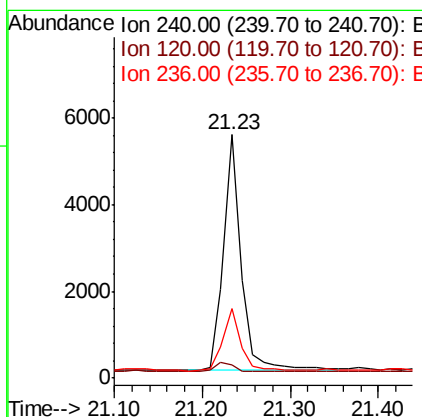
Manual Integrations
APPROVED

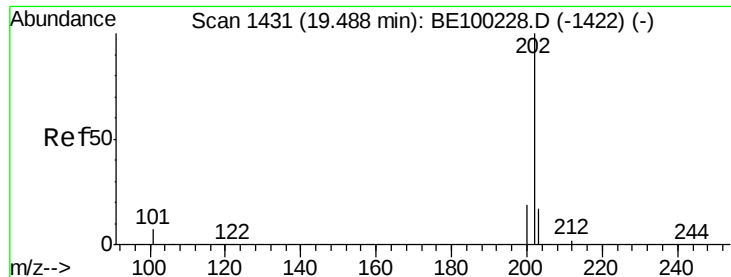
mohammad
7/8/2019 2:13:55 PM



#27
Chrysene-d12
Concen: 0.400 ng
RT: 21.23 min Scan# 1619
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
240	100		
120	5.3	3.3	4.9#
236	28.7	22.6	34.0





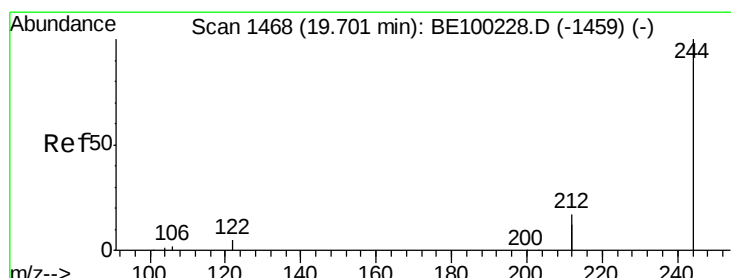
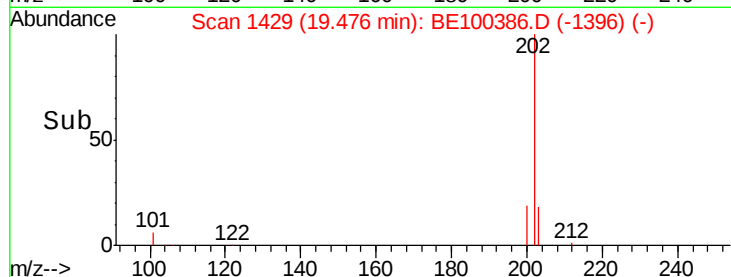
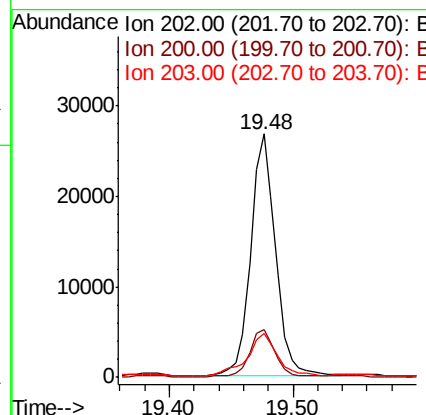
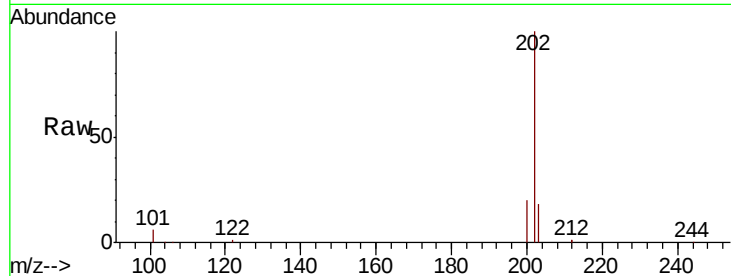
#28
Pvrene
Concen: 1.873 ng
RT: 19.48 min Scan# 1429
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
202	100		
200	19.6	15.6	23.4
203	20.9	14.0	21.0

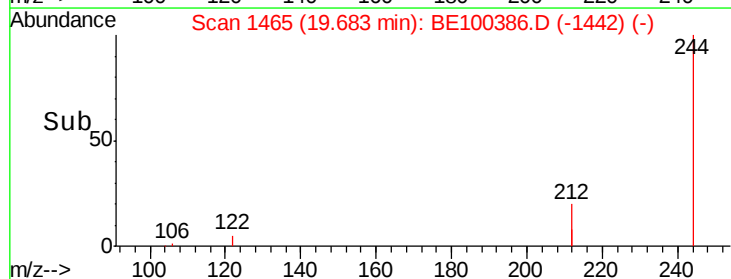
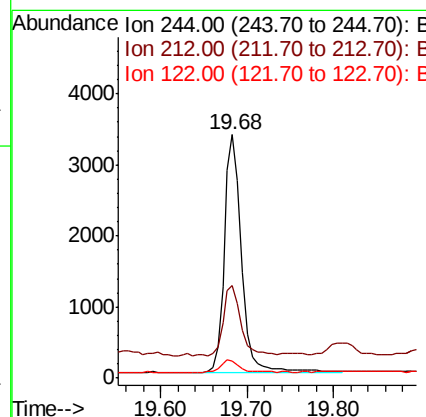
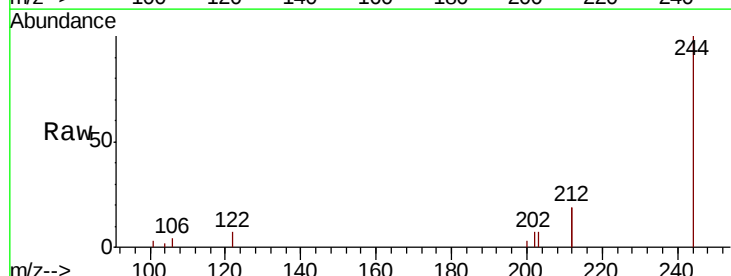
Manual Integrations
APPROVED

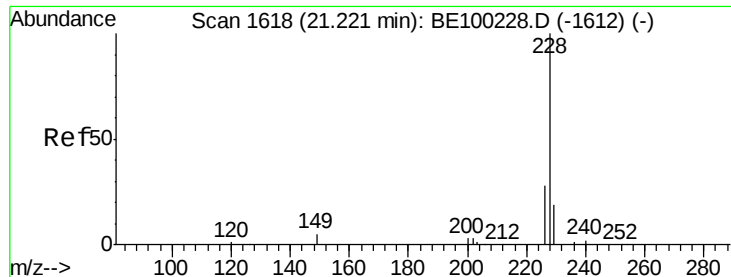
mohammad
7/8/2019 2:13:55 PM



#29
Terphenyl-d14
Concen: 0.295 ng
RT: 19.68 min Scan# 1465
Delta R.T. -0.02 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
244	100		
212	38.1	27.3	40.9
122	7.2	4.7	7.1#





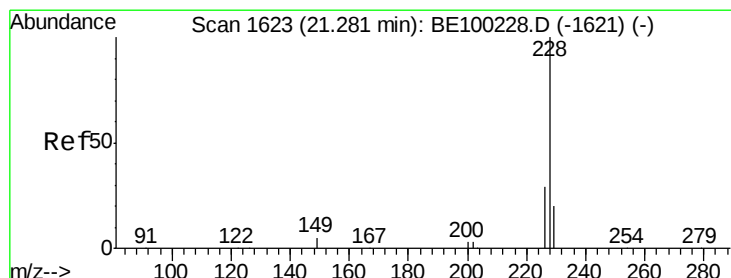
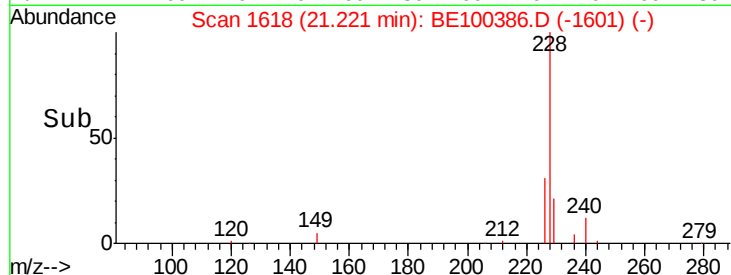
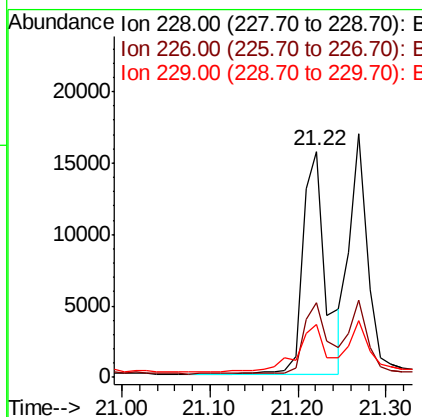
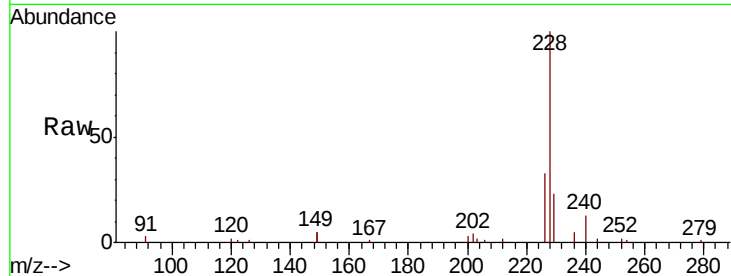
#30
Benzo(a)anthracene
Concen: 1.146 ng
RT: 21.22 min Scan# 1618
Delta R.T. 0.00 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
228	100		
226	33.1	23.2	34.8
229	23.4	15.7	23.5

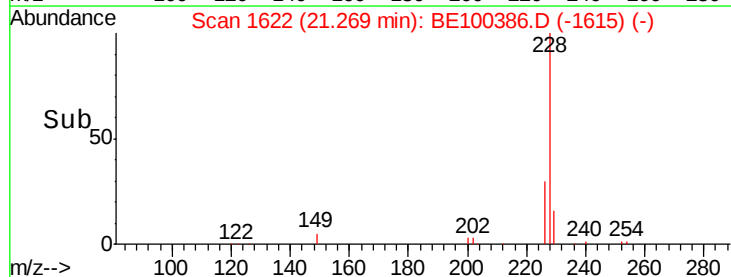
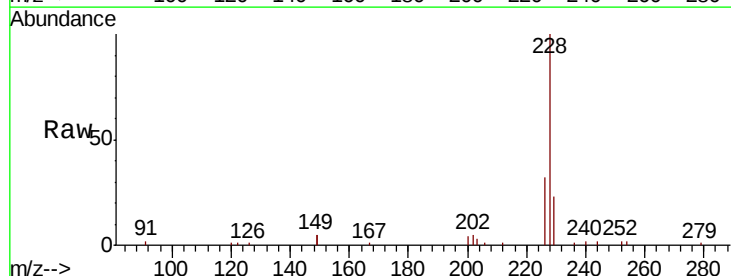
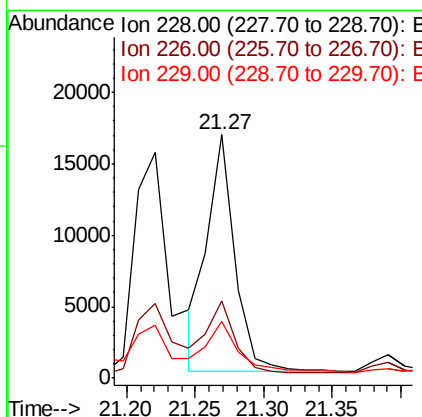
Manual Integrations
APPROVED

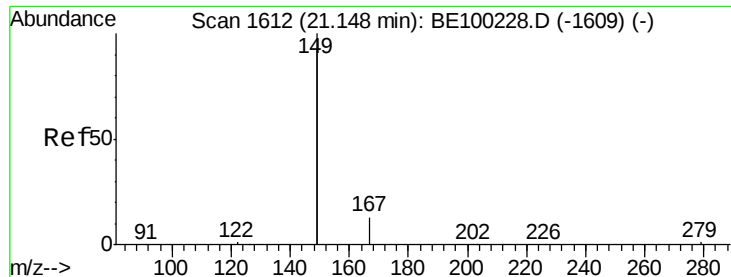
mohammad
7/8/2019 2:13:55 PM



#31
Chrysene
Concen: 0.935 ng
RT: 21.27 min Scan# 1622
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
228	100		
226	31.6	23.9	35.9
229	23.2	16.5	24.7





#32

Bis(2-ethylhexyl)phthalate

Concen: 0.163 ng

RT: 21.14 min Scan# 1611

Delta R.T. -0.01 min

Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Instrument :

BNA_E

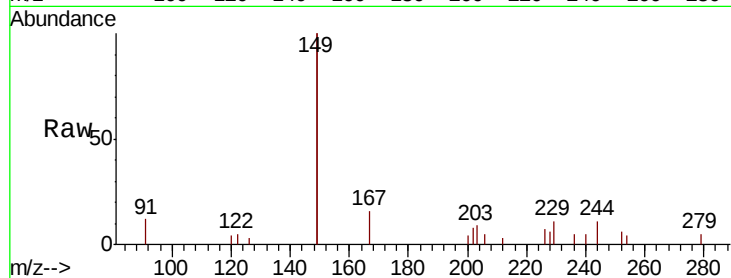
ClientSampleId :

PST-012-B227-062419

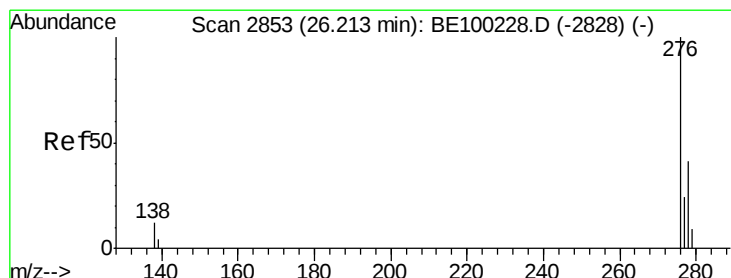
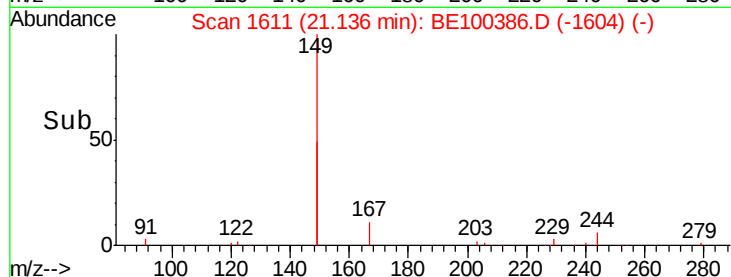
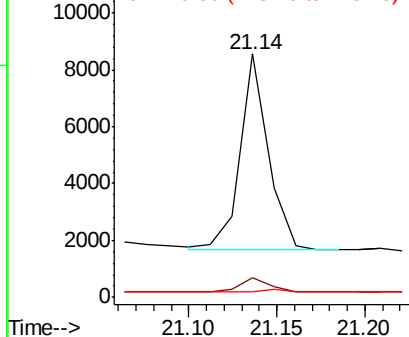
Tot Ion:	149	Resp:	7742
Ion Ratio	Lower	Upper	
149	100		
167	7.1	5.8	8.8
279	2.2	1.1	1.7#

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM



Abundance Ion 149.00 (148.70 to 149.70): E
Ion 167.00 (166.70 to 167.70): E
Ion 279.00 (278.70 to 279.70): E



#33

Indeno(1,2,3-cd)pyrene

Concen: 0.450 ng

RT: 26.20 min Scan# 2849

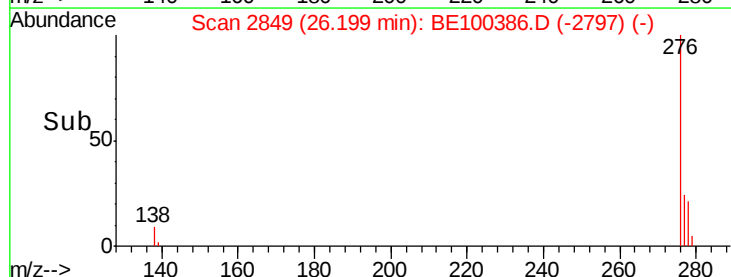
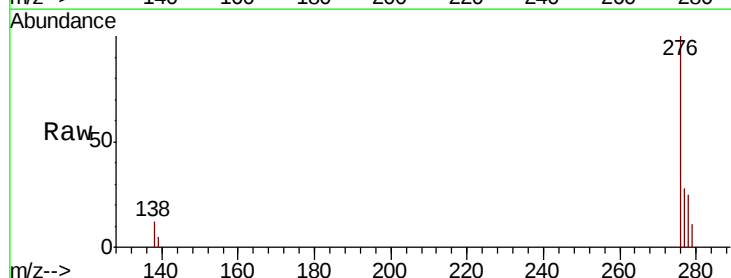
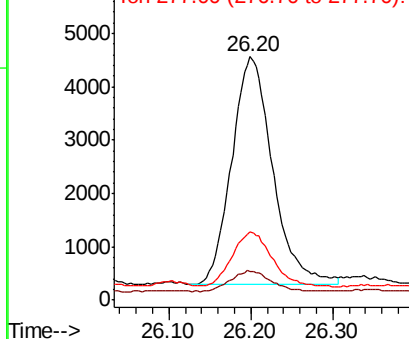
Delta R.T. -0.01 min

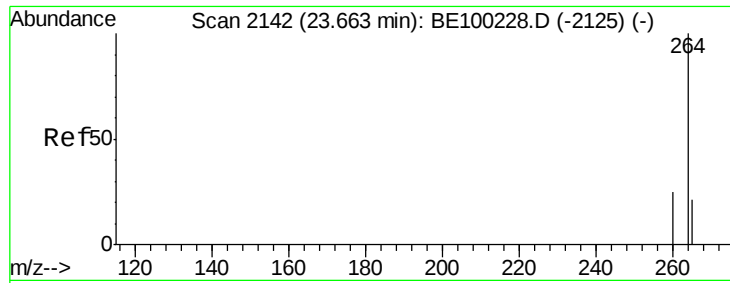
Lab File: BE100386.D

Acq: 5 Jul 2019 17:58

Tgt Ion:	276	Resp:	14861
Ion Ratio	Lower	Upper	
276	100		
138	9.0	9.4	14.0#
277	23.7	19.2	28.8

Abundance Ion 276.00 (275.70 to 276.70): E
Ion 138.00 (137.70 to 138.70): E
Ion 277.00 (276.70 to 277.70): E





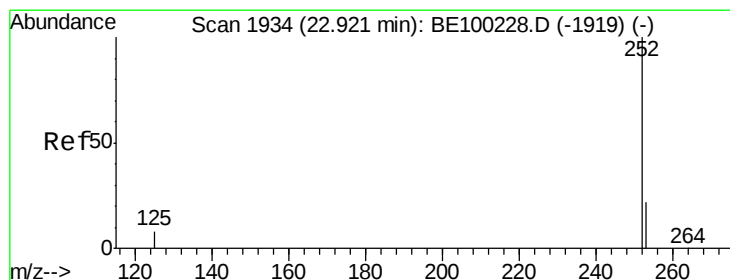
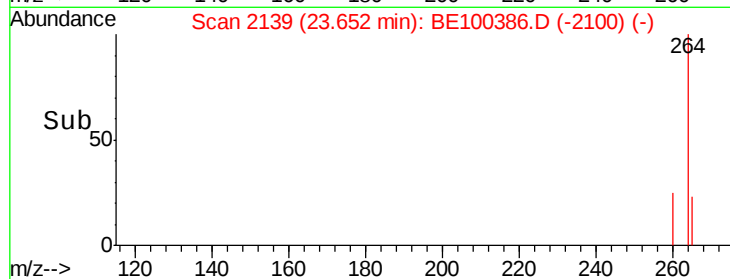
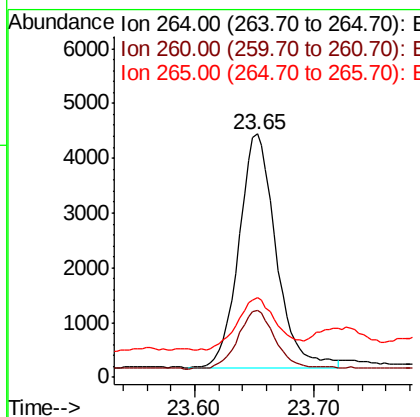
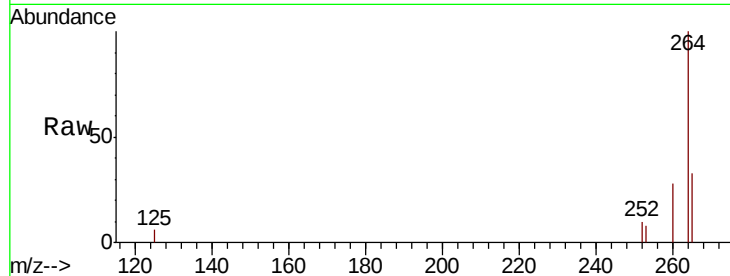
#34
Pervlene-d12
Concen: 0.400 ng
RT: 23.65 min Scan# 2139
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
264	100		
260	27.7	20.8	31.2
265	32.8	21.8	32.6

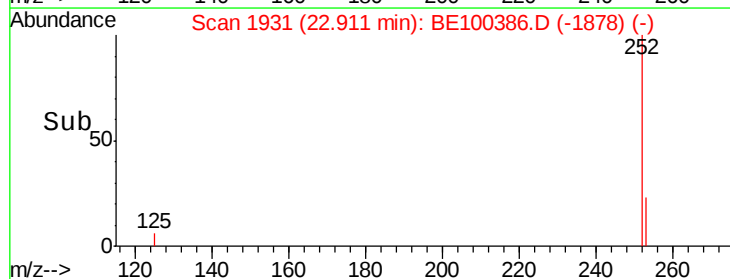
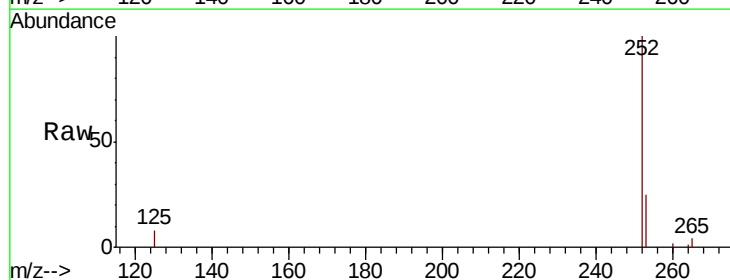
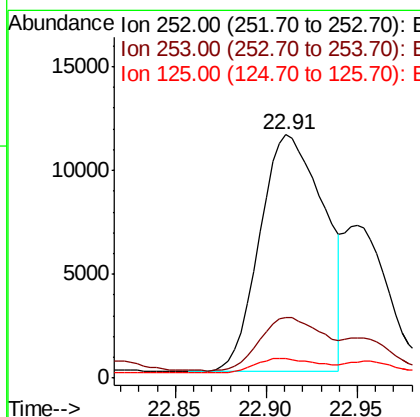
Manual Integrations
APPROVED

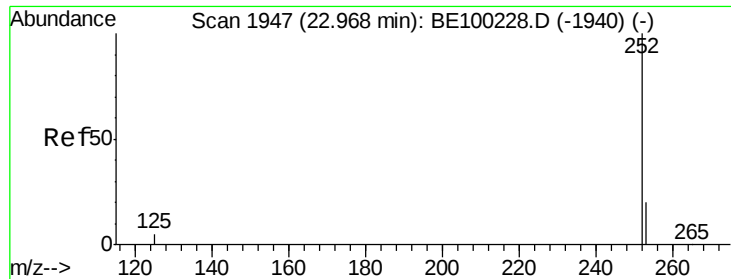
mohammad
7/8/2019 2:13:55 PM



#35
Benzo(b)fluoranthene
Concen: 1.125 ng
RT: 22.91 min Scan# 1931
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
252	100		
253	24.9	19.2	28.8
125	7.9	7.4	11.0





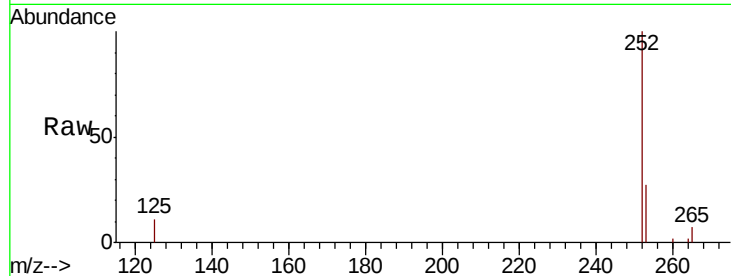
#36
Benzo(k)fluoranthene
Concen: 0.459 ng m
RT: 22.95 min Scan# 1942
Delta R.T. -0.02 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
252	100		
253	26.6	17.9	26.9
125	10.7	5.0	7.4

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM

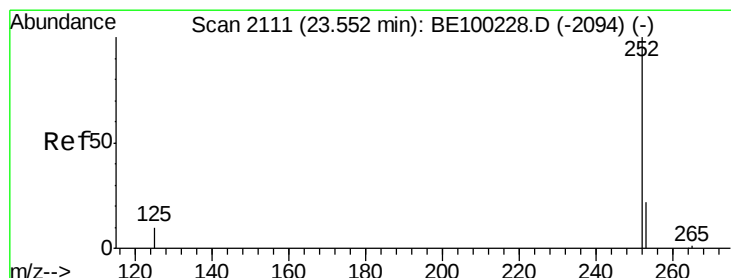
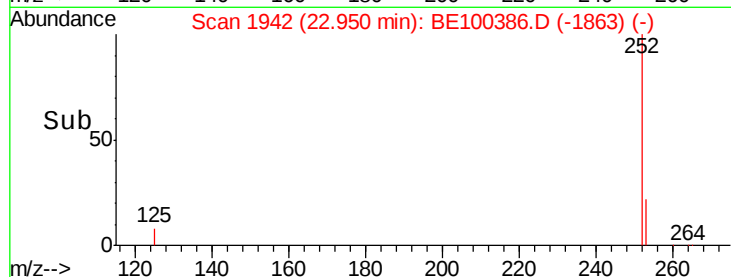
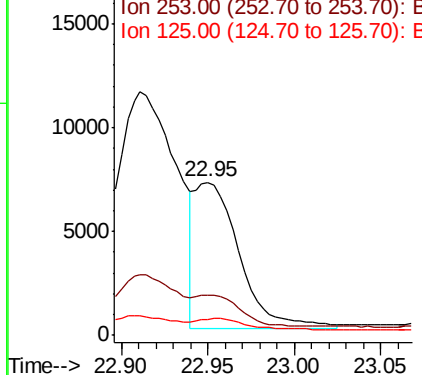


Abundance

Ion 252.00 (251.70 to 252.70): E

Ion 253.00 (252.70 to 253.70): E

Ion 125.00 (124.70 to 125.70): E



#37
Benzo(a)pyrene
Concen: 0.869 ng m
RT: 23.54 min Scan# 2108
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

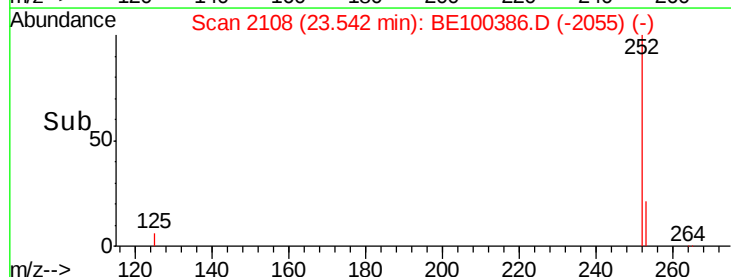
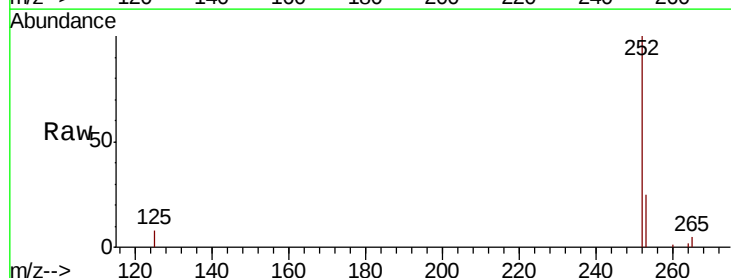
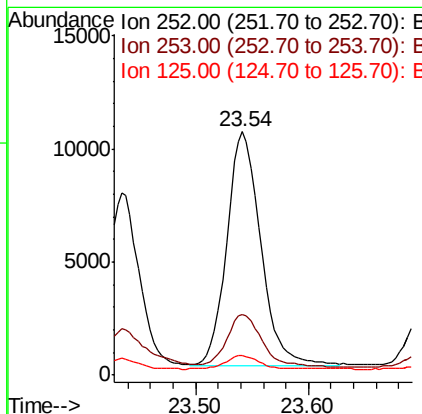
Tgt Ion	Ratio	Lower	Upper
252	100		
253	25.0	19.6	29.4
125	8.2	9.0	13.6

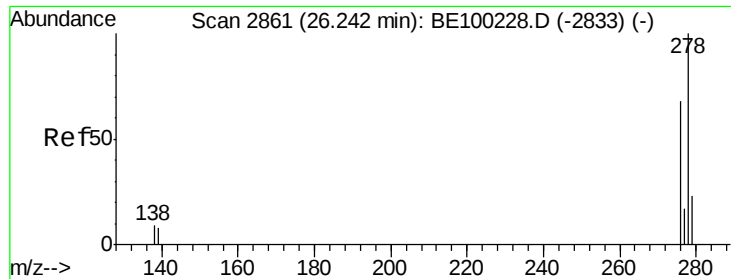
Abundance

Ion 252.00 (251.70 to 252.70): E

Ion 253.00 (252.70 to 253.70): E

Ion 125.00 (124.70 to 125.70): E





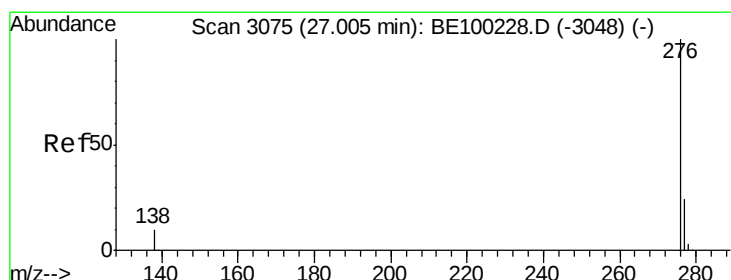
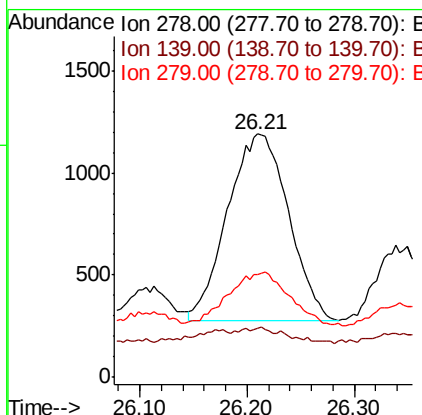
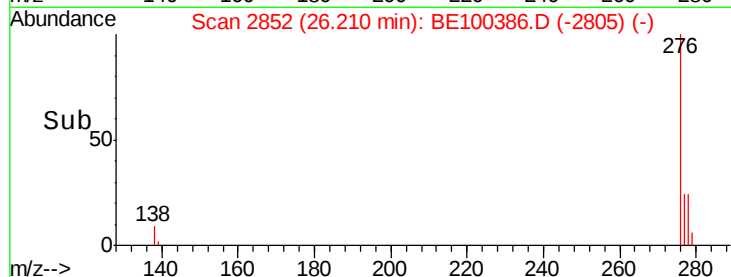
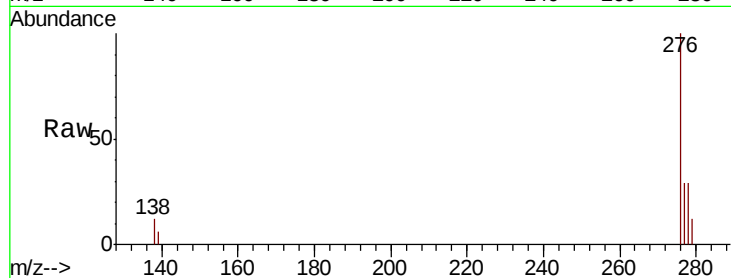
#38
Dibenzo(a,h)anthracene
Concen: 0.138 ng
RT: 26.21 min Scan# 2852
Delta R.T. -0.03 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Instrument :
BNA_E
ClientSampleId :
PST-012-B227-062419

Tot Ion	Ratio	Lower	Upper
278	100		
139	20.1	8.2	12.2#
279	42.2	20.3	30.5#

Manual Integrations
APPROVED

mohammad
7/8/2019 2:13:55 PM



#39
Benzo(g,h,i)perylene
Concen: 0.533 ng
RT: 26.99 min Scan# 3071
Delta R.T. -0.01 min
Lab File: BE100386.D
Acq: 5 Jul 2019 17:58

Tgt Ion	Ratio	Lower	Upper
276	100		
277	27.2	20.2	30.2
138	12.0	9.0	13.6

