Quantitation Report (QT Reviewed)

Data Path : Z:\svoasrv\HPCHEM1\BNA_N\Data\BN122023\
Data File : BN029135.D
Acq On : 20 Dec 2023 15:26
Operator : MA/JU
Sample : SSTDICC1.6
Misc :
ALS Vial : 7 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Quant Time: Dec 20 17:51:14 2023
Quant Method : Z:\svoasrv\HPCHEM1\BNA_N\Methods\8270-SIM-BN122023.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Wed Dec 20 17:45:31 2023
Response via : Initial Calibration

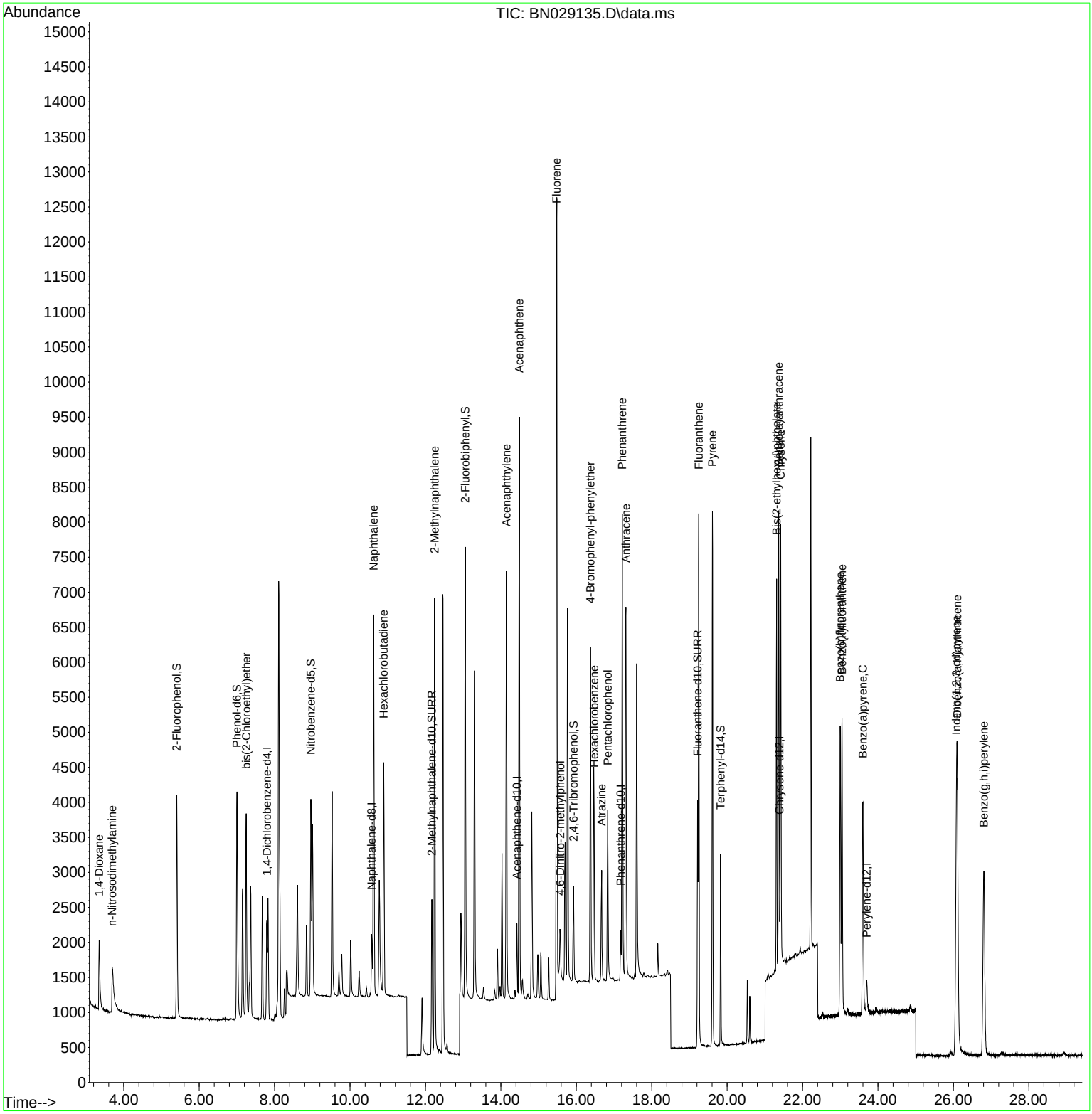
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) 1,4-Dichlorobenzene-d4	7.797	152	714	0.400	ng		0.00
7) Naphthalene-d8	10.573	136	1233	0.400	ng		#-0.01
13) Acenaphthene-d10	14.425	164	587	0.400	ng		0.00
19) Phenanthrene-d10	17.181	188	993	0.400	ng		0.00
29) Chrysene-d12	21.384	240	567	0.400	ng		0.00
35) Perylene-d12	23.701	264	634	0.400	ng		-0.01
System Monitoring Compounds							
4) 2-Fluorophenol	5.406	112	2831	1.656	ng		0.00
5) Phenol-d6	7.002	99	3134	1.670	ng		0.00
8) Nitrobenzene-d5	8.961	82	2680	1.666	ng		0.00
11) 2-Methylnaphthalene-d10	12.166	152	3267	1.749	ng		0.00
14) 2,4,6-Tribromophenol	15.927	330	765	1.491	ng		0.00
15) 2-Fluorobiphenyl	13.057	172	5684	1.658	ng		0.00
27) Fluoranthene-d10	19.215	212	4042	1.682	ng		0.00
31) Terphenyl-d14	19.828	244	2470	1.586	ng		0.00
Target Compounds							Qvalue
2) 1,4-Dioxane	3.348	88	1069	1.599	ng		99
3) n-Nitrosodimethylamine	3.694	42	757	1.623	ng	#	90
6) bis(2-Chloroethyl)ether	7.248	93	2380	1.631	ng		96
9) Naphthalene	10.626	128	6703	1.668	ng		93
10) Hexachlorobutadiene	10.893	225	2179	1.646	ng	#	98
12) 2-Methylnaphthalene	12.242	142	4460	1.698	ng		98
16) Acenaphthylene	14.147	152	6700	1.620	ng		99
17) Acenaphthene	14.490	154	4036	1.626	ng		97
18) Fluorene	15.473	166	5369	1.604	ng		98
20) 4,6-Dinitro-2-methylph...	15.580	198	771	1.696	ng	#	44
21) 4-Bromophenyl-phenylether	16.374	248	1659	1.615	ng	#	77
22) Hexachlorobenzene	16.473	284	1992	1.666	ng		97
23) Atrazine	16.672	200	1426	1.660	ng	#	85
24) Pentachlorophenol	16.833	266	1204	1.698	ng		92
25) Phenanthrene	17.218	178	6785	1.656	ng		96
26) Anthracene	17.317	178	6696	1.691	ng		98
28) Fluoranthene	19.248	202	7113	1.679	ng		99
30) Pyrene	19.610	202	7139	1.598	ng		98
32) Benzo(a)anthracene	21.367	228	5053	1.621	ng		93
33) Chrysene	21.420	228	5026	1.630	ng		93
34) Bis(2-ethylhexyl)phtha...	21.313	149	5312	1.629	ng	#	95
36) Indeno(1,2,3-cd)pyrene	26.080	276	7028	1.730	ng	#	65
37) Benzo(b)fluoranthene	22.999	252	5592	1.734	ng	#	76
38) Benzo(k)fluoranthene	23.046	252	5566	1.763	ng	#	76
39) Benzo(a)pyrene	23.598	252	4962	1.724	ng	#	73
40) Dibenzo(a,h)anthracene	26.104	278	5496	1.750	ng	#	77
41) Benzo(g,h,i)perylene	26.808	276	5945	1.719	ng	#	87

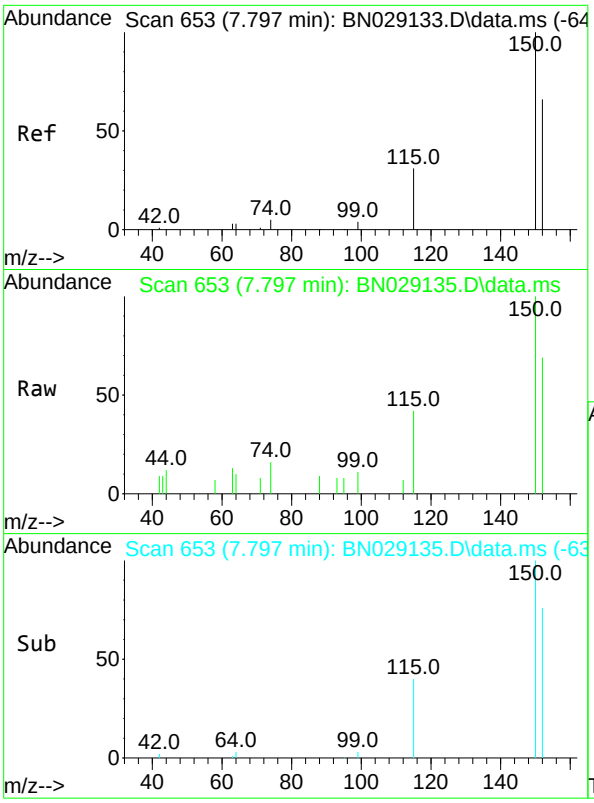
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : Z:\svoasrv\HPCHEM1\BNA_N\Data\BN122023\
Data File : BN029135.D
Acq On : 20 Dec 2023 15:26
Operator : MA/JU
Sample : SSTDICC1.6
Misc :
ALS Vial : 7 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Quant Time: Dec 20 17:51:14 2023
Quant Method : Z:\svoasrv\HPCHEM1\BNA_N\Methods\8270-SIM-BN122023.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Wed Dec 20 17:45:31 2023
Response via : Initial Calibration



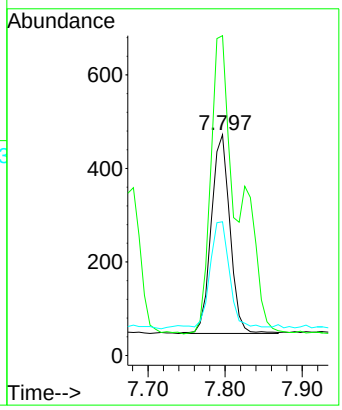


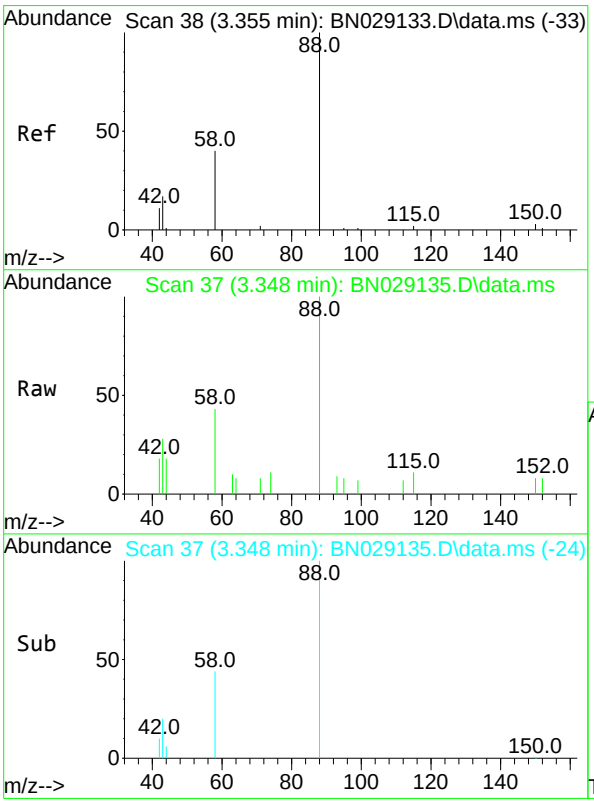
#1
1,4-Dichlorobenzene-d4
Concen: 0.400 ng
RT: 7.797 min Scan# 6
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:152 Resp: 714

Ion	Ratio	Lower	Upper
152	100		
150	144.9	117.6	176.4
115	60.6	44.2	66.2

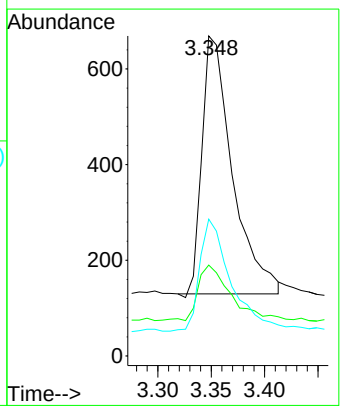


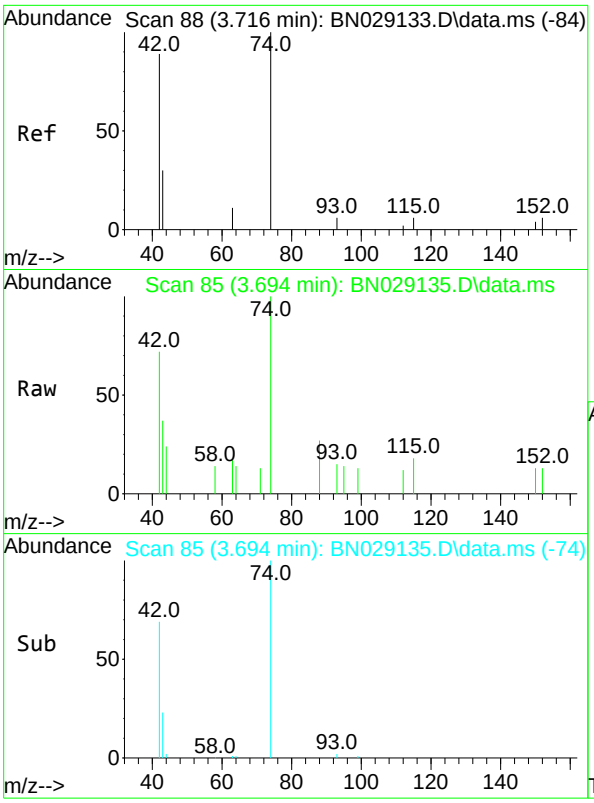


#2
1,4-Dioxane
Concen: 1.599 ng
RT: 3.348 min Scan# 37
Delta R.T. -0.007 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion: 88 Resp: 1069

Ion	Ratio	Lower	Upper
88	100		
43	23.2	19.4	29.2
58	44.3	35.4	53.0



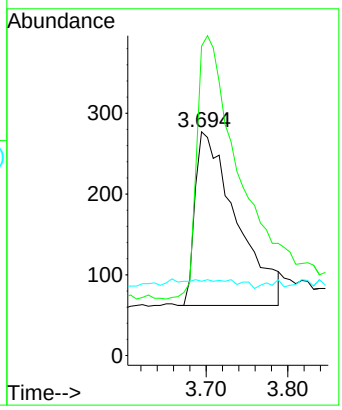


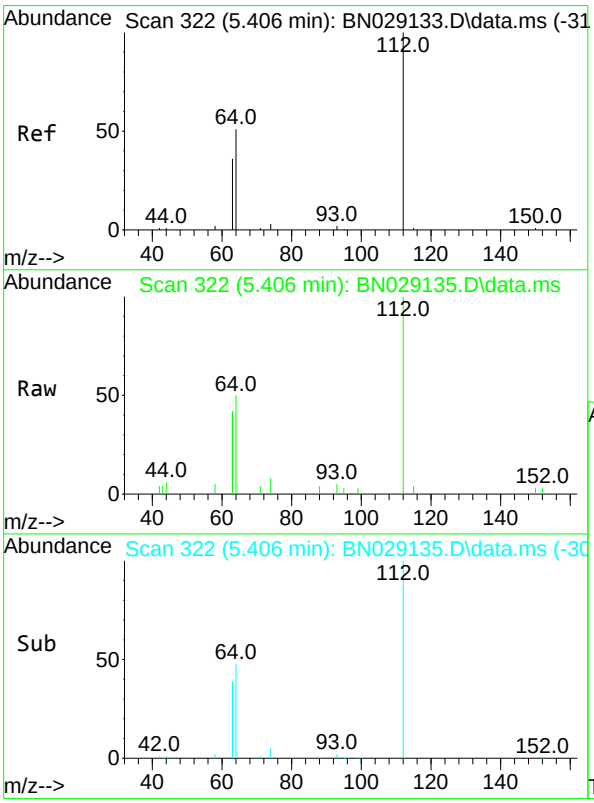
#3
n-Nitrosodimethylamine
Concen: 1.623 ng
RT: 3.694 min Scan# 8
Delta R.T. -0.022 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion: 42 Resp: 757

Ion	Ratio	Lower	Upper
42	100		
74	149.1	109.4	164.0
44	0.0	3.1	4.7#

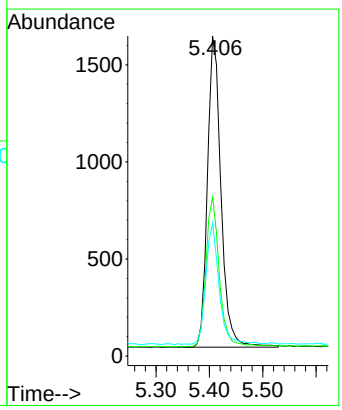


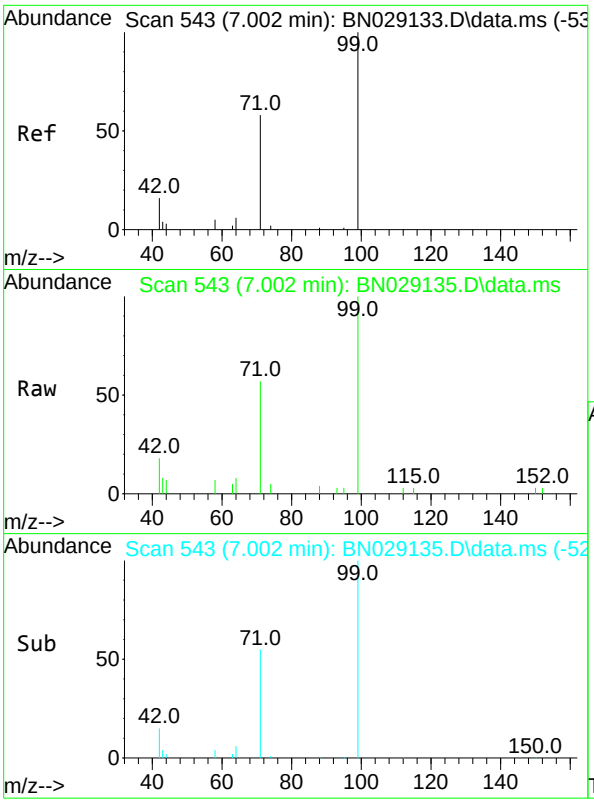


#4
2-Fluorophenol
Concen: 1.656 ng
RT: 5.406 min Scan# 322
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:112 Resp: 2831

Ion	Ratio	Lower	Upper
112	100		
64	48.3	38.6	58.0
63	38.2	30.0	45.0



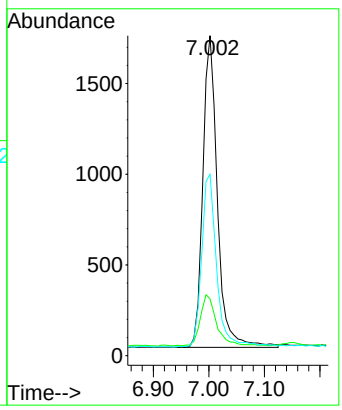


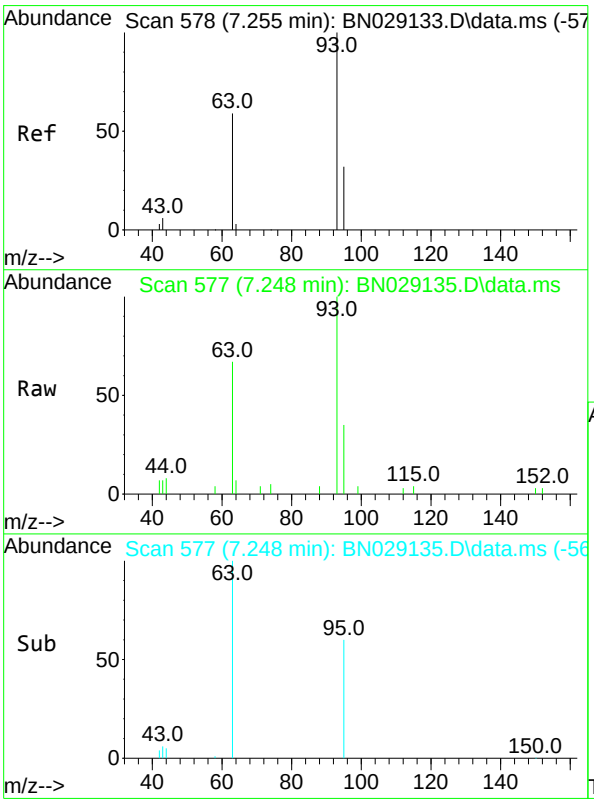
#5
Phenol-d6
Concen: 1.670 ng
RT: 7.002 min Scan# 54
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion: 99 Resp: 3134

Ion	Ratio	Lower	Upper
99	100		
42	18.0	13.8	20.6
71	57.1	45.4	68.2

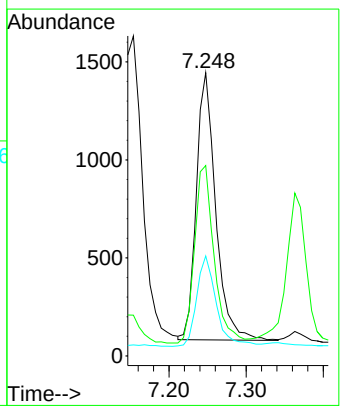


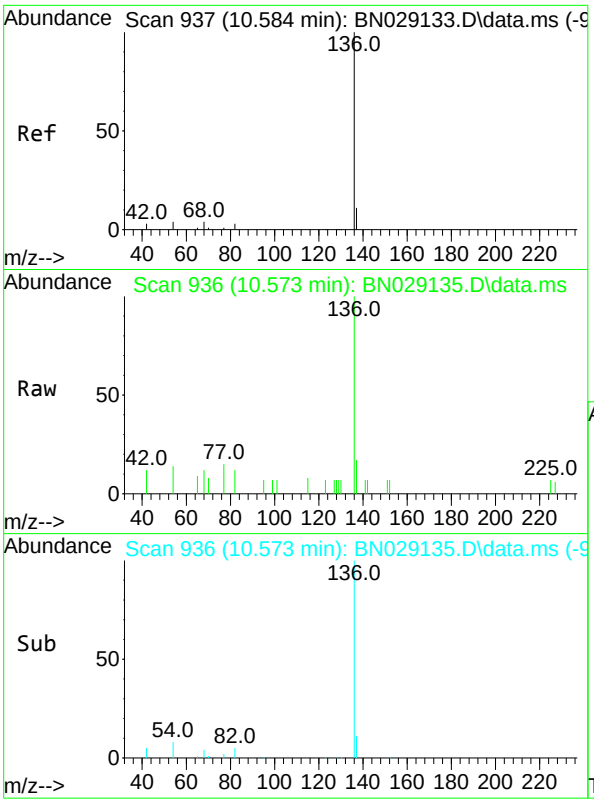


#6
bis(2-Chloroethyl)ether
Concen: 1.631 ng
RT: 7.248 min Scan# 577
Delta R.T. -0.007 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion: 93 Resp: 2380

Ion	Ratio	Lower	Upper
93	100		
63	67.0	57.0	85.6
95	34.3	27.4	41.2



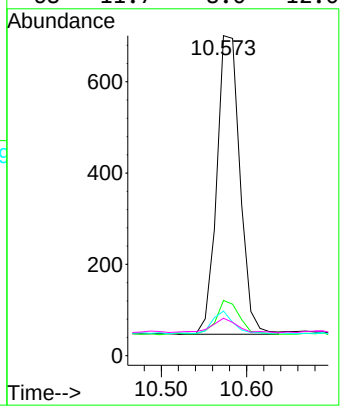


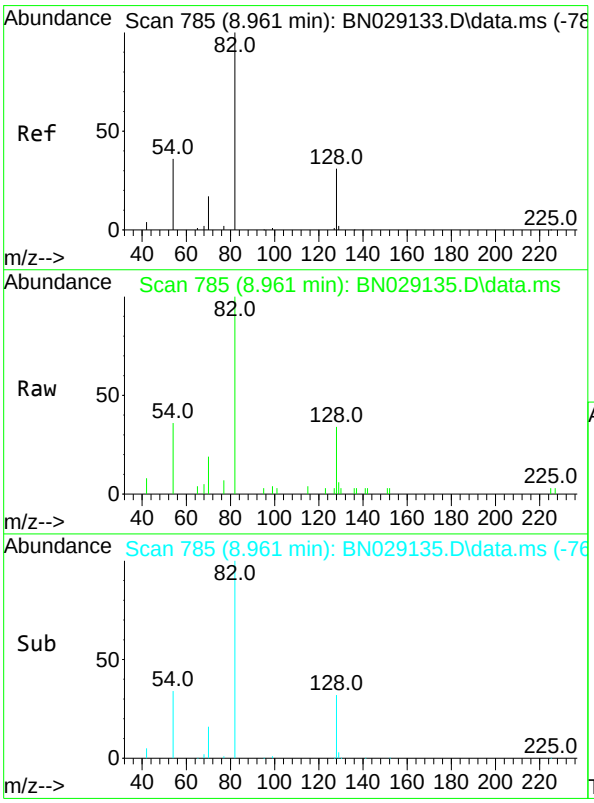
#7
Naphthalene-d8
Concen: 0.400 ng
RT: 10.573 min Scan# 9
Delta R.T. -0.011 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:136 Resp: 1233

Ion	Ratio	Lower	Upper
136	100		
137	17.3	13.4	20.0
54	14.0	8.6	13.0#
68	11.7	8.0	12.0

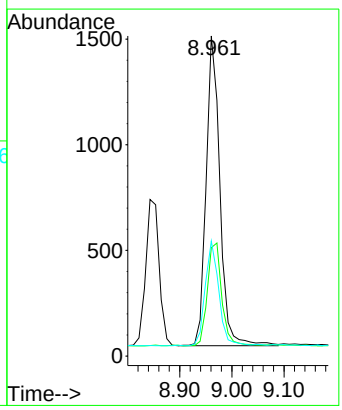


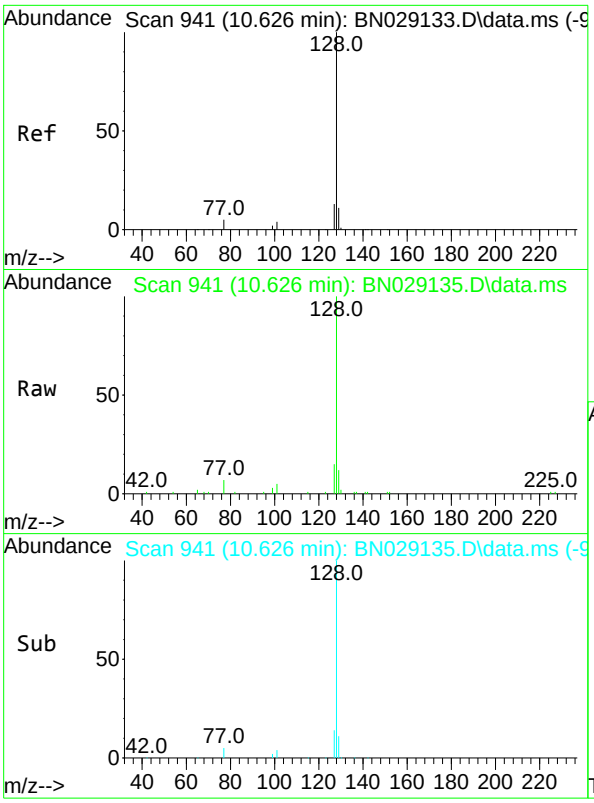


#8
Nitrobenzene-d5
Concen: 1.666 ng
RT: 8.961 min Scan# 785
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion: 82 Resp: 2680

Ion	Ratio	Lower	Upper
82	100		
128	33.9	33.0	49.4
54	35.9	35.8	53.8



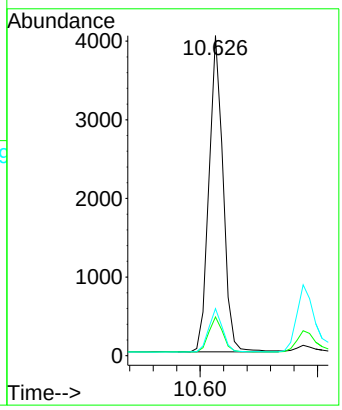


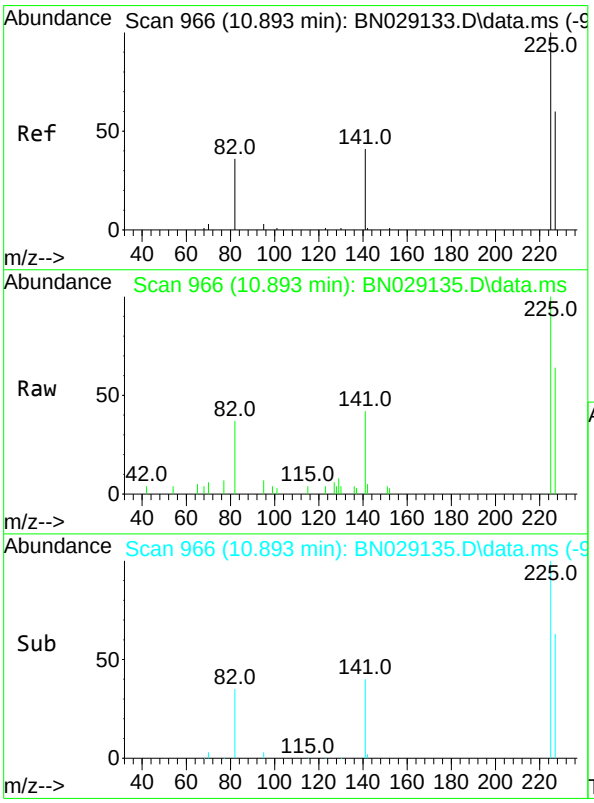
#9
Naphthalene
Concen: 1.668 ng
RT: 10.626 min Scan# 94
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:128 Resp: 6703

Ion	Ratio	Lower	Upper
128	100		
129	12.1	12.0	18.0
127	14.7	14.1	21.1

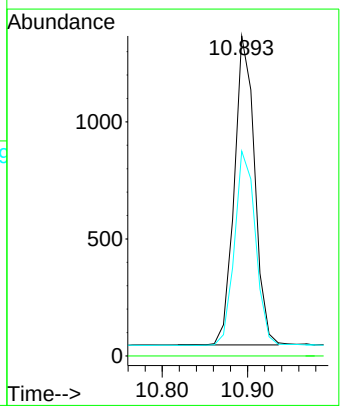


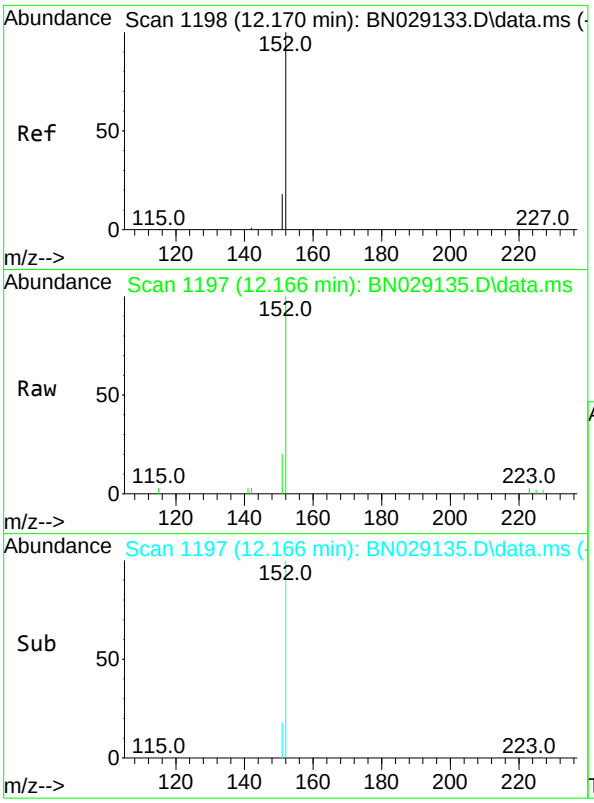


#10
Hexachlorobutadiene
Concen: 1.646 ng
RT: 10.893 min Scan# 966
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:225 Resp: 2179

Ion	Ratio	Lower	Upper
225	100		
223	0.0	0.0	0.0
227	64.9	50.7	76.1



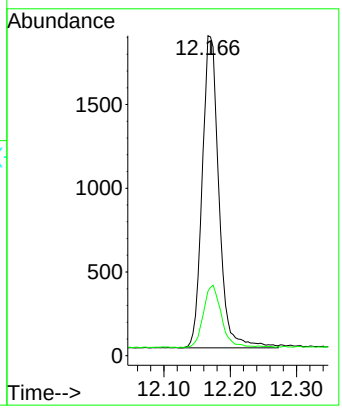


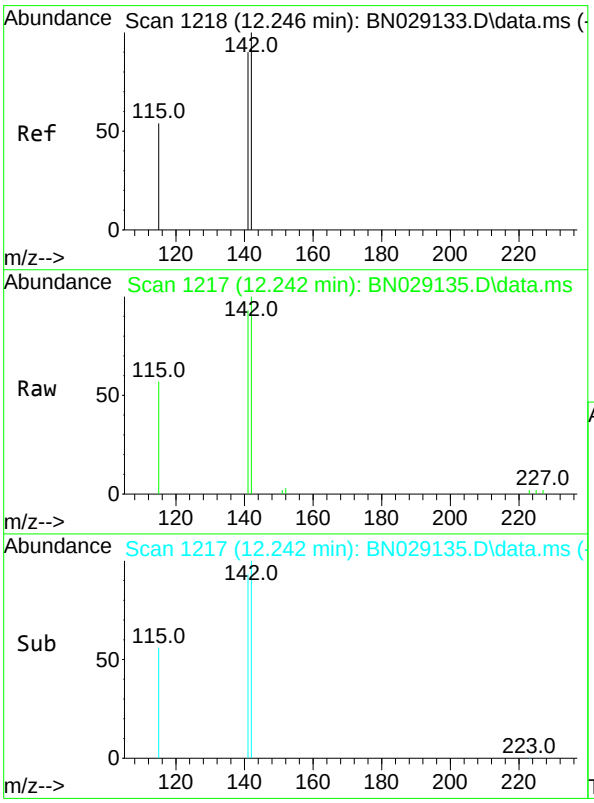
#11
2-Methylnaphthalene-d10
Concen: 1.749 ng
RT: 12.166 min Scan# 11
Delta R.T. -0.004 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:152 Resp: 3267

Ion	Ratio	Lower	Upper
152	100		
151	21.5	17.4	26.2

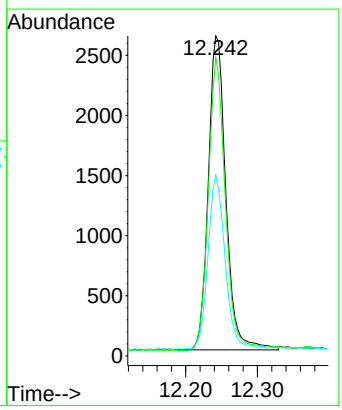


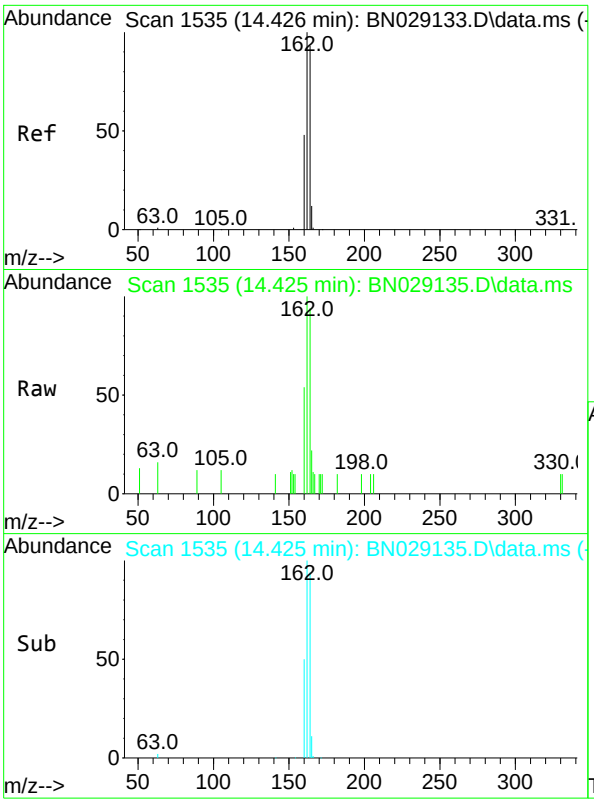


#12
2-Methylnaphthalene
Concen: 1.698 ng
RT: 12.242 min Scan# 1217
Delta R.T. -0.004 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:142 Resp: 4460

Ion	Ratio	Lower	Upper
142	100		
141	93.3	73.0	109.4
115	56.5	46.8	70.2



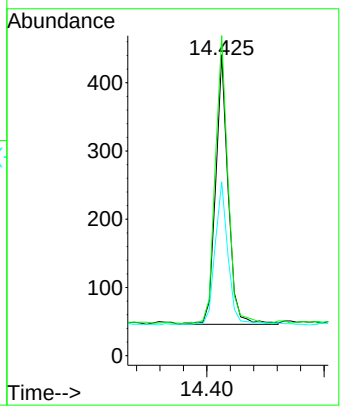


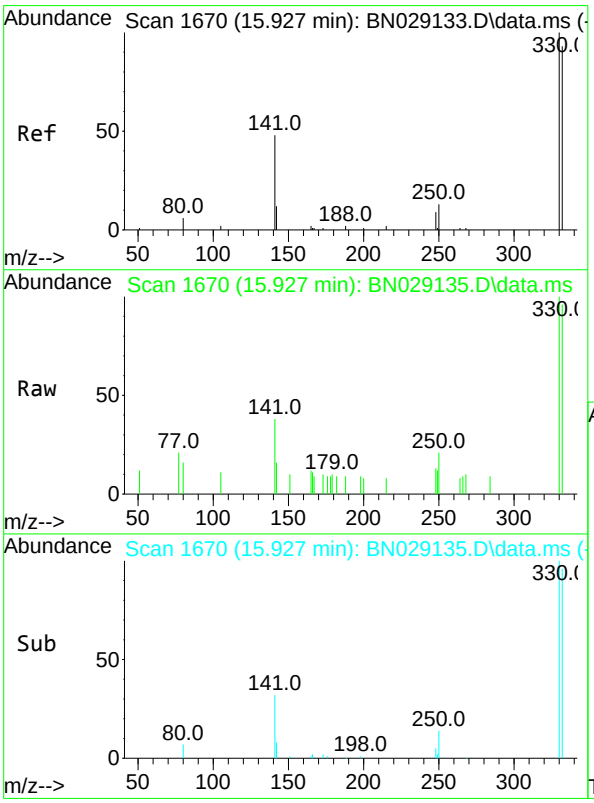
#13
Acenaphthene-d10
Concen: 0.400 ng
RT: 14.425 min Scan# 1
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:164 Resp: 587

Ion	Ratio	Lower	Upper
164	100		
162	106.3	85.0	127.4
160	57.8	45.8	68.8

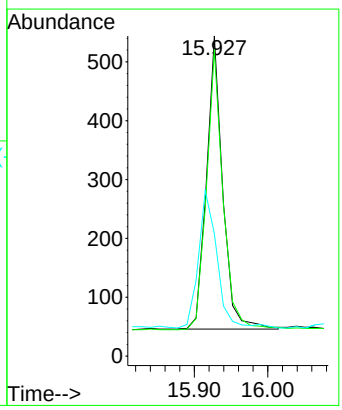


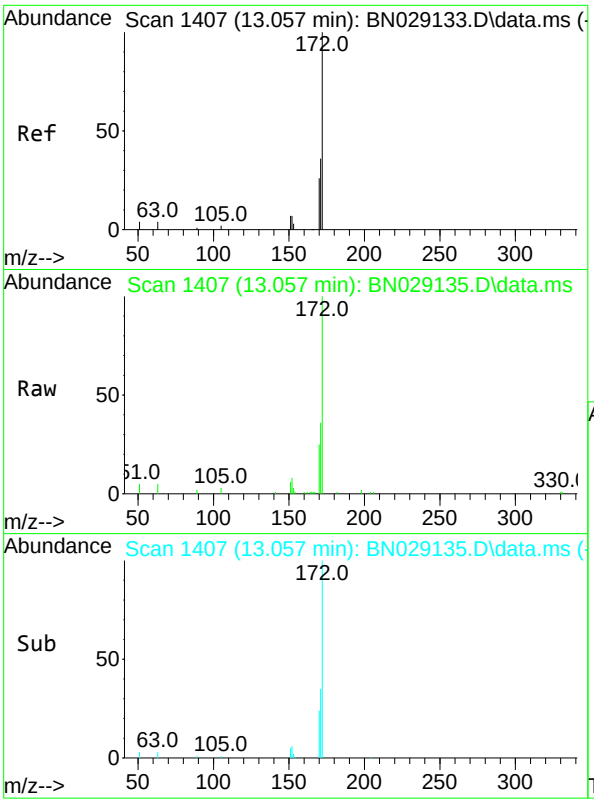


#14
2,4,6-Tribromophenol
Concen: 1.491 ng
RT: 15.927 min Scan# 1670
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:330 Resp: 765

Ion	Ratio	Lower	Upper
330	100		
332	97.4	83.4	125.0
141	53.2	43.8	65.8



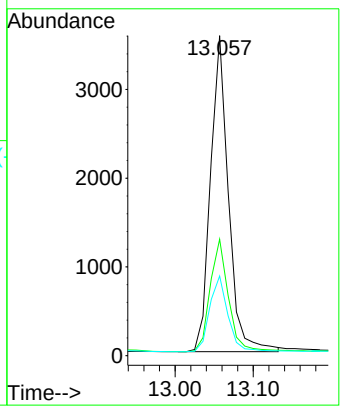


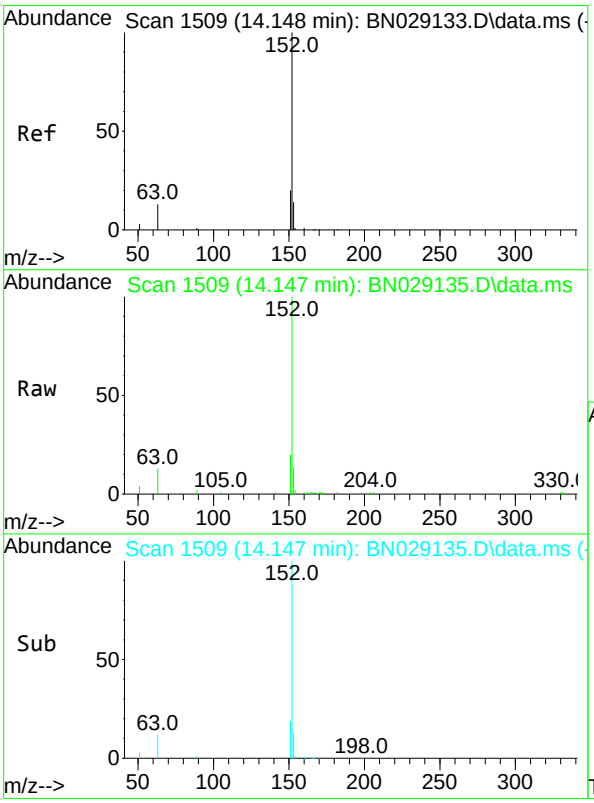
#15
2-Fluorobiphenyl
Concen: 1.658 ng
RT: 13.057 min Scan# 14
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:172 Resp: 5684

Ion	Ratio	Lower	Upper
172	100		
171	36.4	32.2	48.4
170	24.9	25.0	37.4#

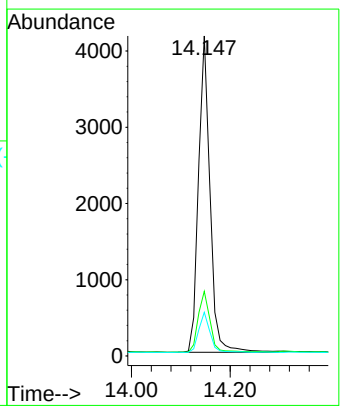


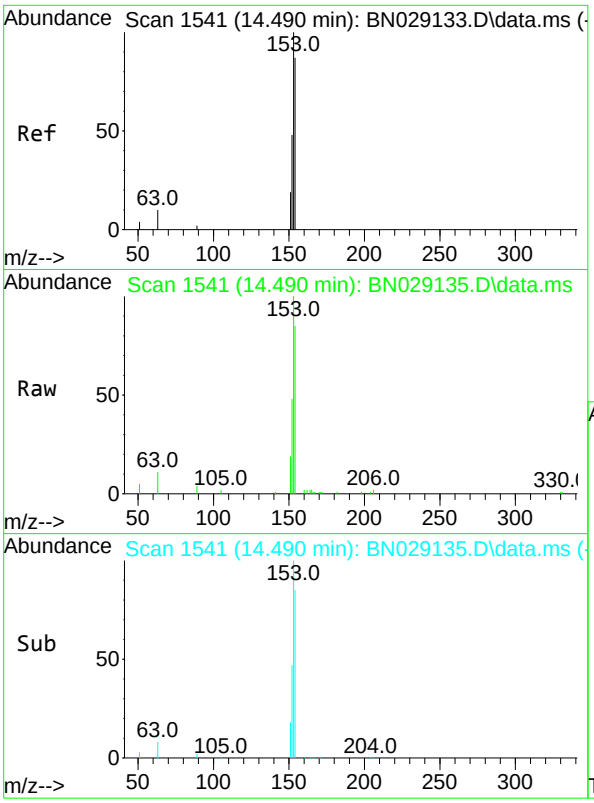


#16
Acenaphthylene
Concen: 1.620 ng
RT: 14.147 min Scan# 1509
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:152 Resp: 6700

Ion	Ratio	Lower	Upper
152	100		
151	20.1	16.3	24.5
153	12.4	10.1	15.1



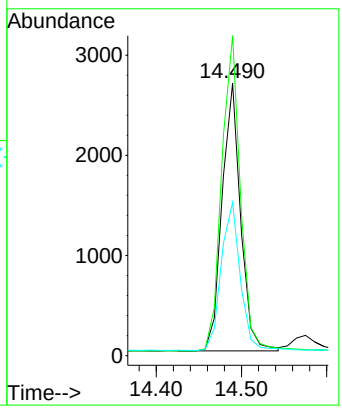


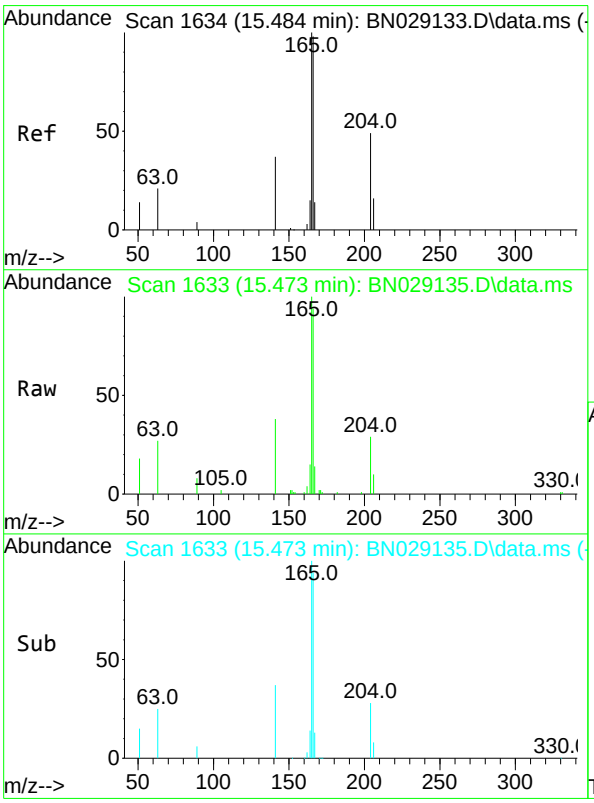
#17
Acenaphthene
Concen: 1.626 ng
RT: 14.490 min Scan# 1
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:154 Resp: 4036

Ion	Ratio	Lower	Upper
154	100		
153	120.4	99.9	149.9
152	57.9	47.4	71.2

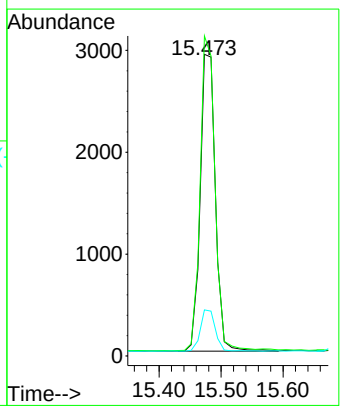


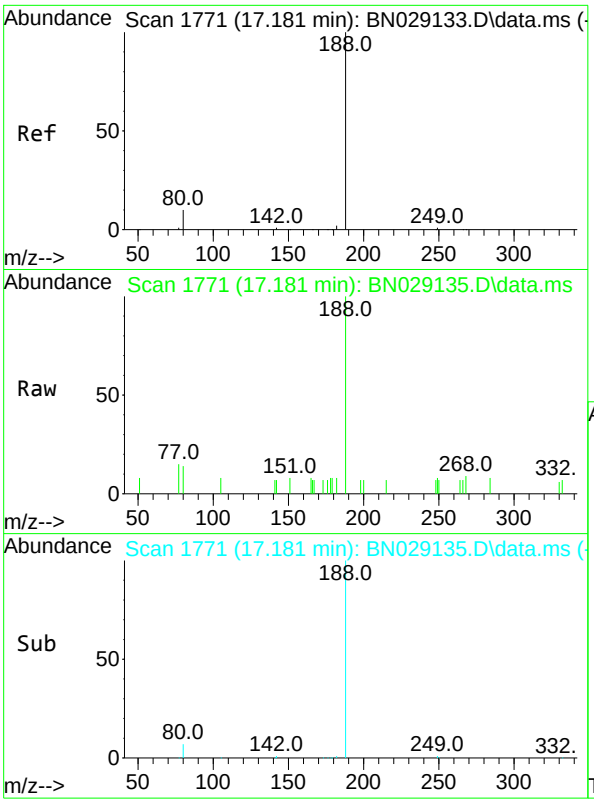


#18
Fluorene
Concen: 1.604 ng
RT: 15.473 min Scan# 1633
Delta R.T. -0.011 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:166 Resp: 5369

Ion	Ratio	Lower	Upper
166	100		
165	103.2	84.3	126.5
167	13.5	11.8	17.8



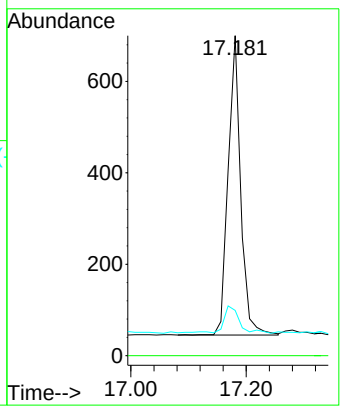


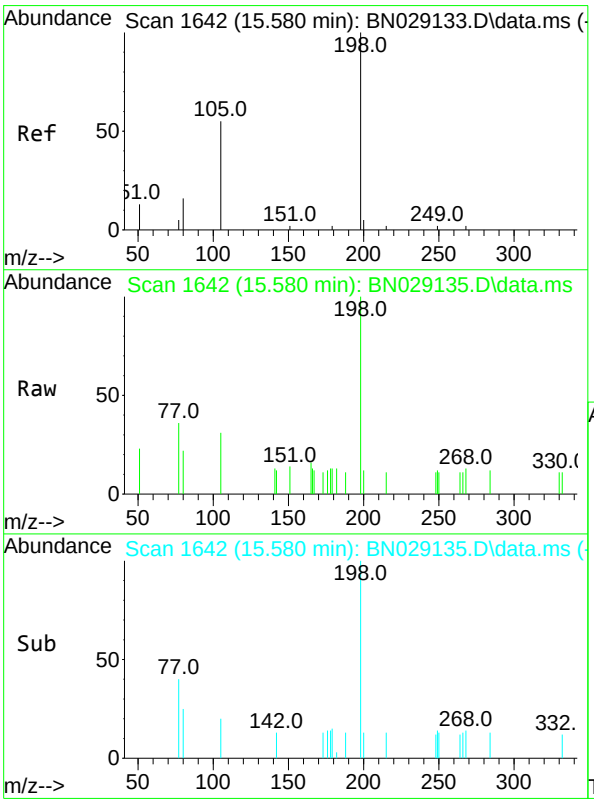
#19
Phenanthrene-d10
Concen: 0.400 ng
RT: 17.181 min Scan# 1
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:188 Resp: 993

Ion	Ratio	Lower	Upper
188	100		
94	0.0	0.0	0.0
80	14.1	13.7	20.5

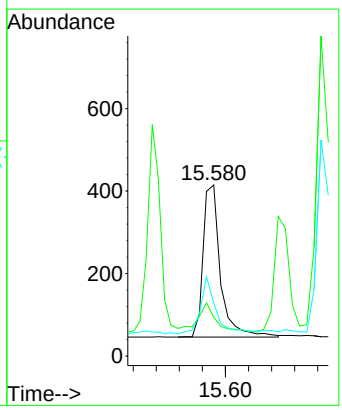


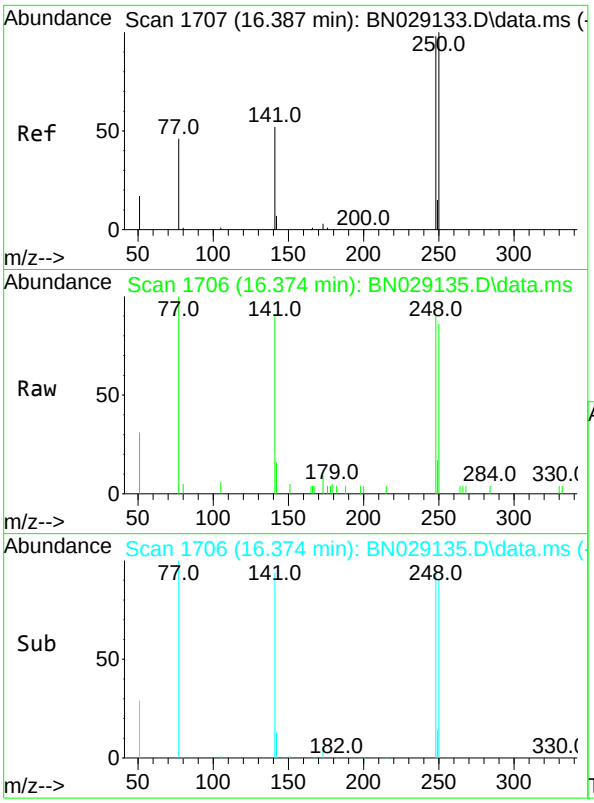


#20
4,6-Dinitro-2-methylphenol
Concen: 1.696 ng
RT: 15.580 min Scan# 1642
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:198 Resp: 771

Ion	Ratio	Lower	Upper
198	100		
51	22.7	53.6	80.4#
105	31.3	65.6	98.4#



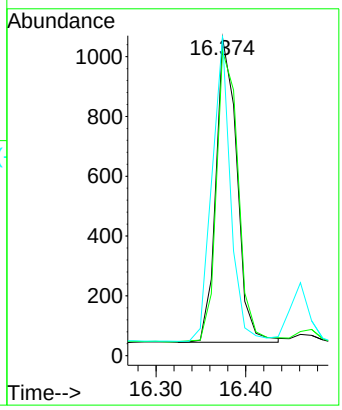


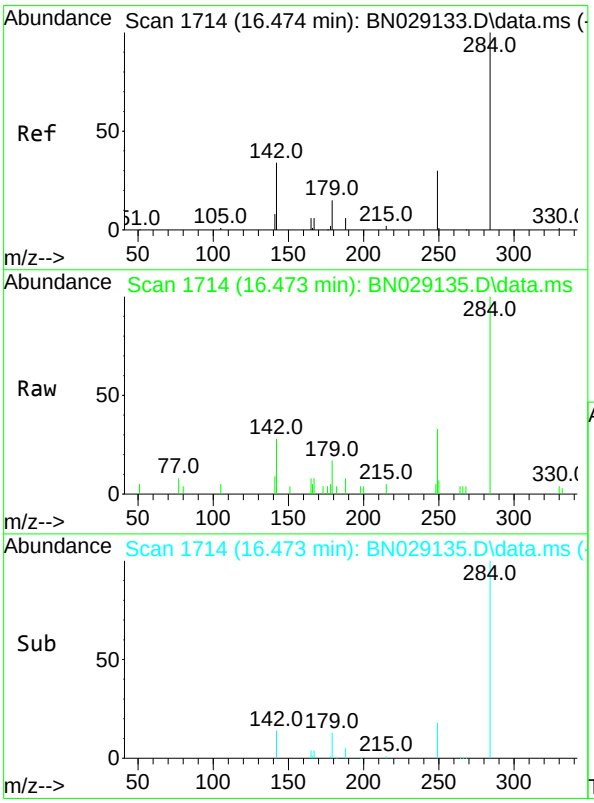
#21
4-Bromophenyl-phenylether
Concen: 1.615 ng
RT: 16.374 min Scan# 1
Delta R.T. -0.013 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:248 Resp: 1659

Ion	Ratio	Lower	Upper
248	100		
250	95.9	82.2	123.2
141	100.7	49.7	74.5#

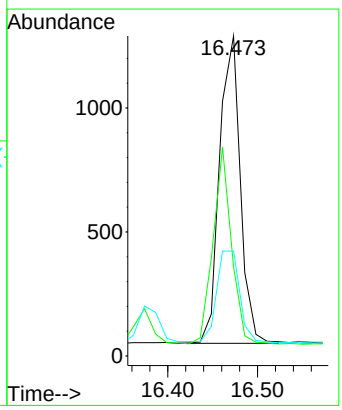


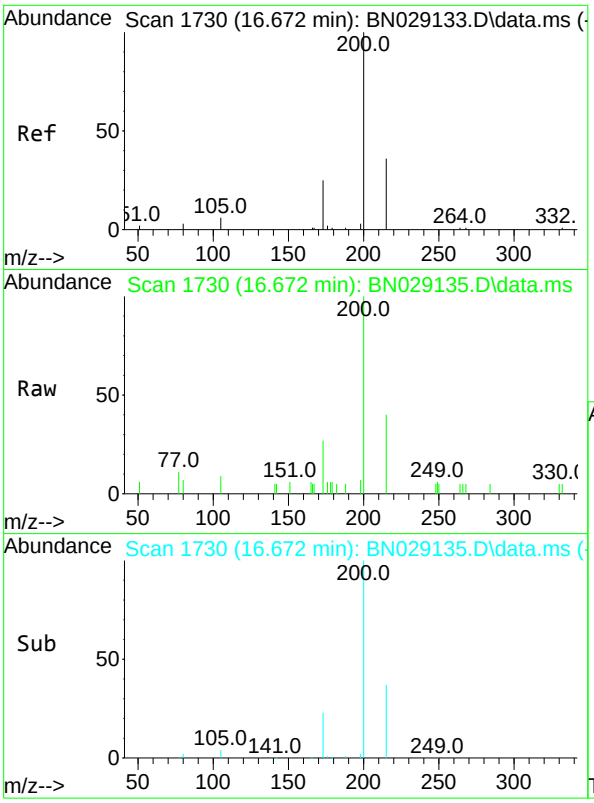


#22
Hexachlorobenzene
Concen: 1.666 ng
RT: 16.473 min Scan# 1714
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:284 Resp: 1992

Ion	Ratio	Lower	Upper
284	100		
142	56.8	46.9	70.3
249	33.3	28.6	43.0



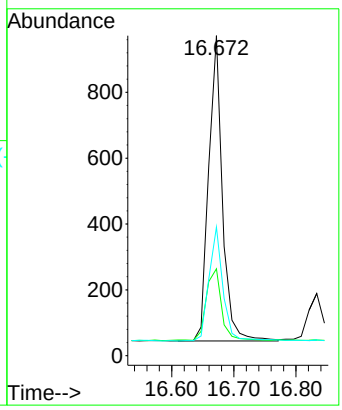


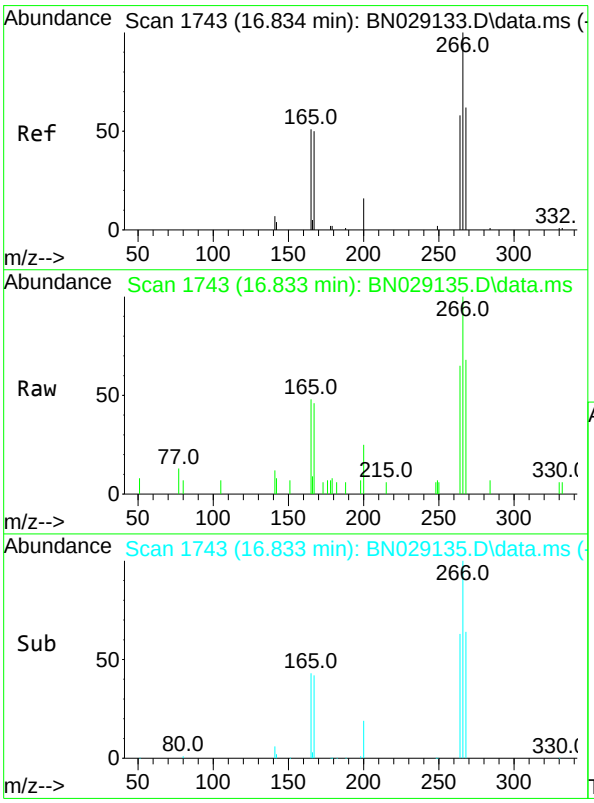
#23
Atrazine
Concen: 1.660 ng
RT: 16.672 min Scan# 1
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:200 Resp: 1426

Ion	Ratio	Lower	Upper
200	100		
173	27.2	31.4	47.2#
215	40.2	38.5	57.7

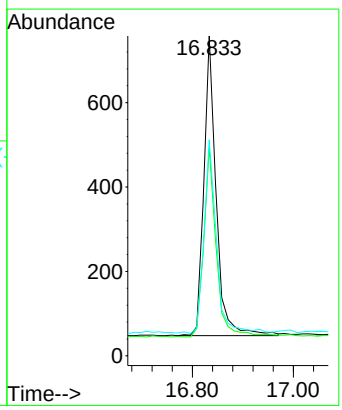


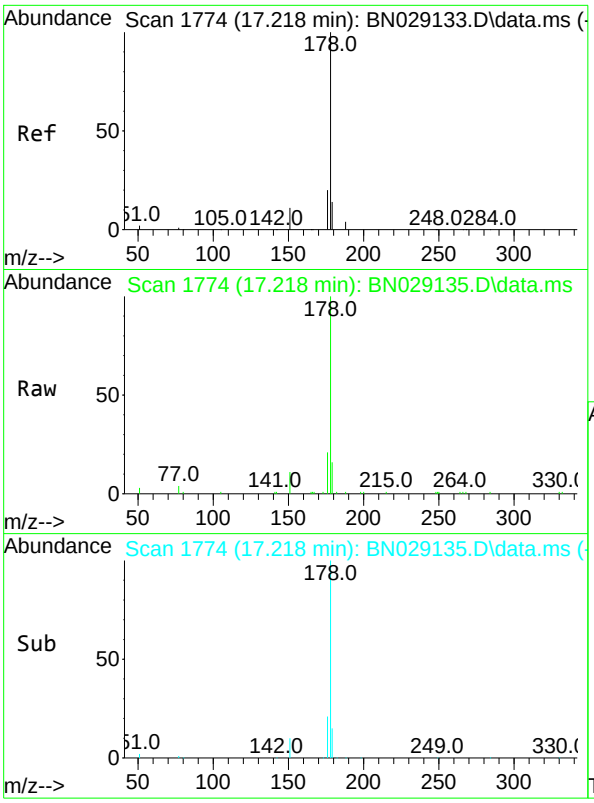


#24
Pentachlorophenol
Concen: 1.698 ng
RT: 16.833 min Scan# 1743
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:266 Resp: 1204

Ion	Ratio	Lower	Upper
266	100		
264	64.2	45.0	67.6
268	64.8	55.5	83.3



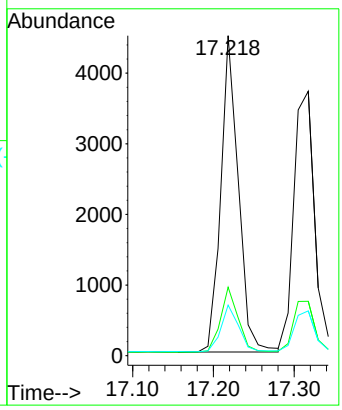


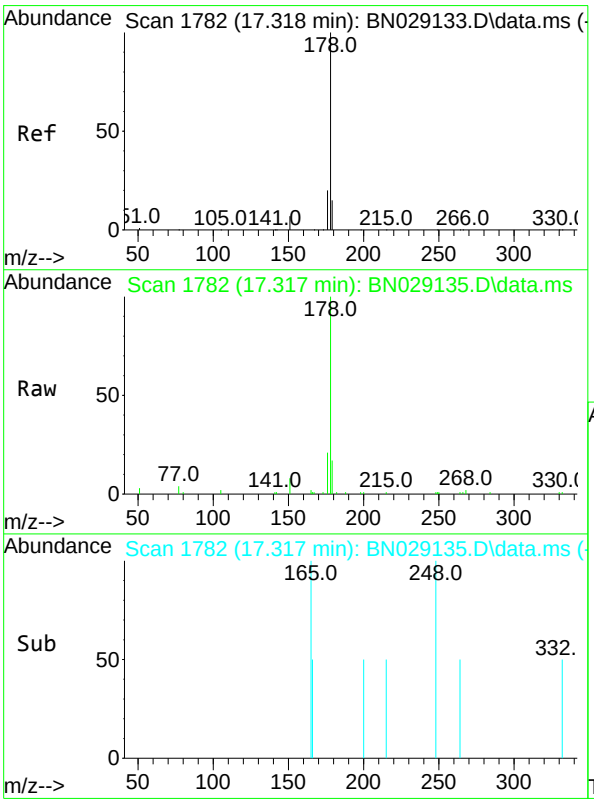
#25
Phenanthrene
Concen: 1.656 ng
RT: 17.218 min Scan# 1
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:178 Resp: 6785

Ion	Ratio	Lower	Upper
178	100		
176	20.7	17.4	26.0
179	14.8	13.7	20.5

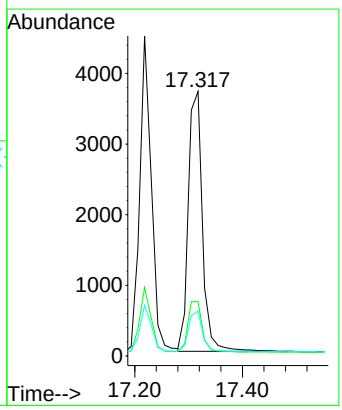


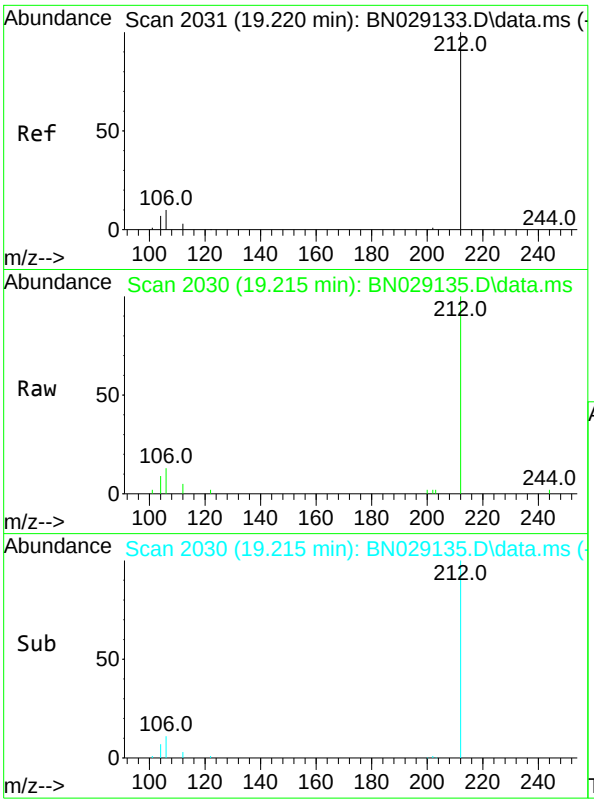


#26
Anthracene
Concen: 1.691 ng
RT: 17.317 min Scan# 1782
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:178 Resp: 6696

Ion	Ratio	Lower	Upper
178	100		
176	19.9	15.8	23.8
179	15.6	11.4	17.0



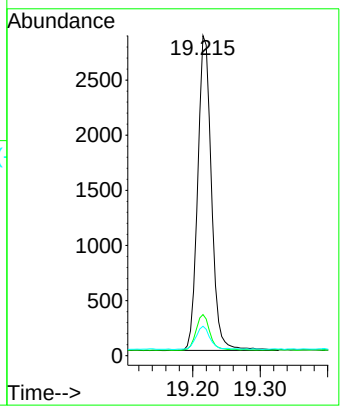


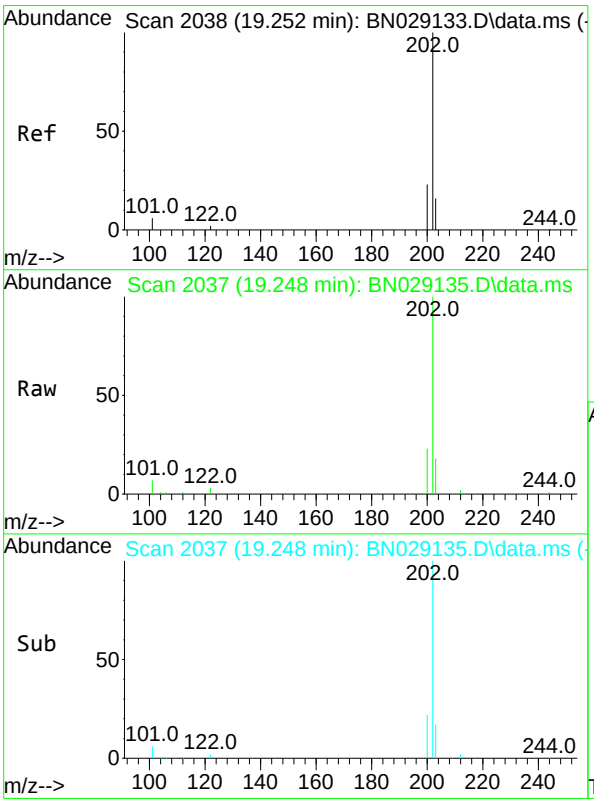
#27
Fluoranthene-d10
Concen: 1.682 ng
RT: 19.215 min Scan# 2
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:212 Resp: 4042

Ion	Ratio	Lower	Upper
212	100		
106	11.6	9.6	14.4
104	7.6	6.5	9.7

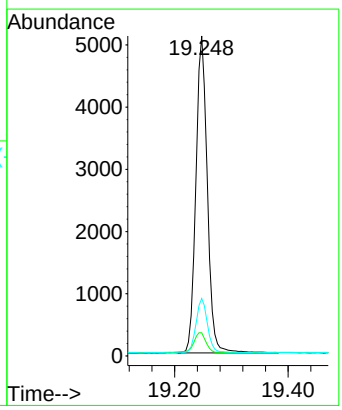


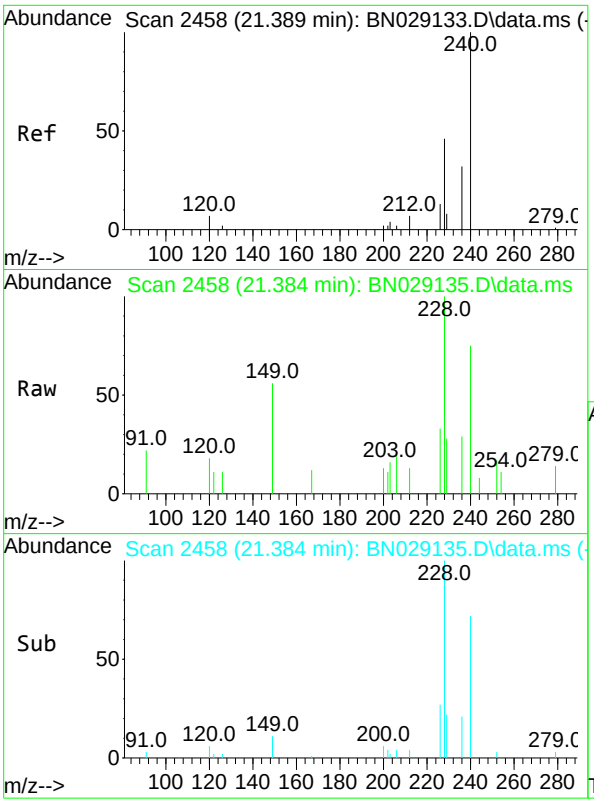


#28
Fluoranthene
Concen: 1.679 ng
RT: 19.248 min Scan# 2037
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:202 Resp: 7113

Ion	Ratio	Lower	Upper
202	100		
101	7.3	5.3	7.9
203	16.9	13.8	20.6



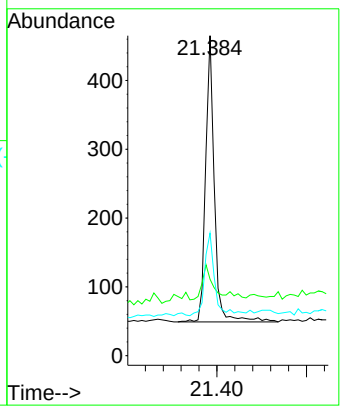


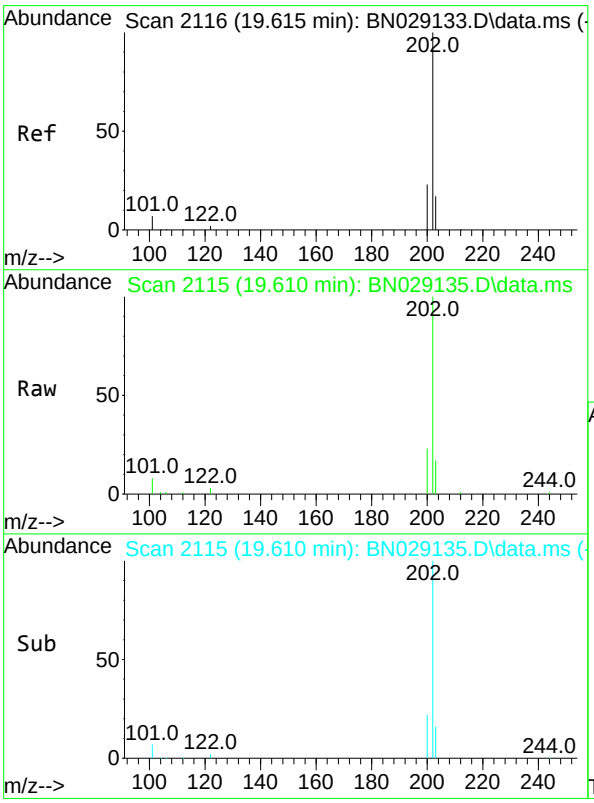
#29
Chrysene-d12
Concen: 0.400 ng
RT: 21.384 min Scan# 24
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:240 Resp: 567

Ion	Ratio	Lower	Upper
240	100		
120	23.9	21.4	32.0
236	38.3	33.5	50.3

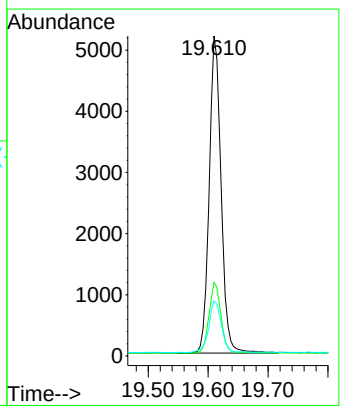


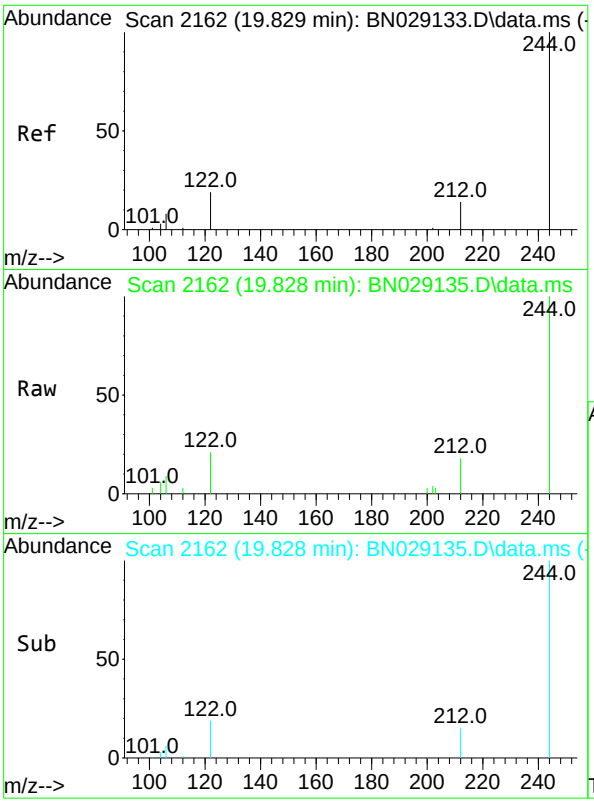


#30
Pyrene
Concen: 1.598 ng
RT: 19.610 min Scan# 2115
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:202 Resp: 7139

Ion	Ratio	Lower	Upper
202	100		
200	22.3	18.0	27.0
203	17.2	15.1	22.7



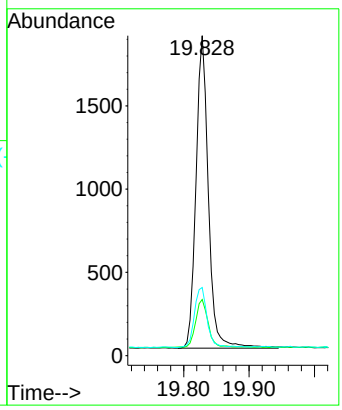


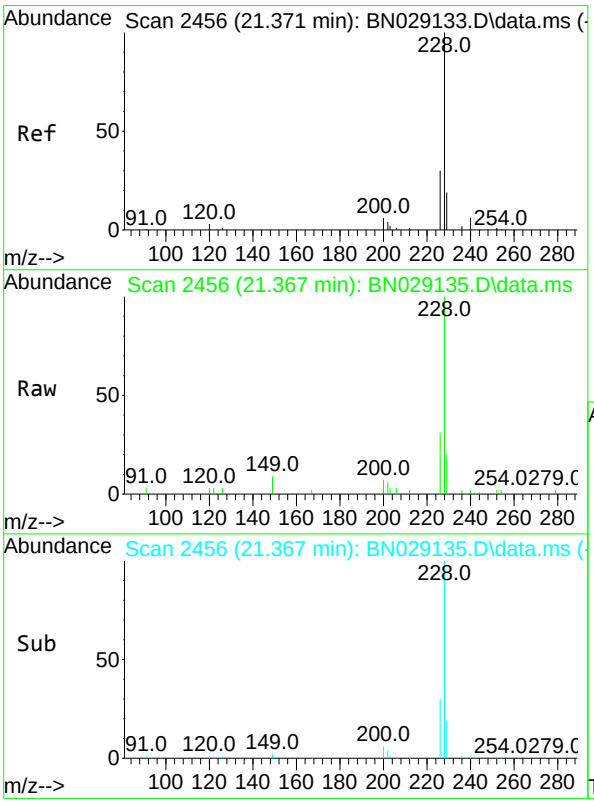
#31
Terphenyl-d14
Concen: 1.586 ng
RT: 19.828 min Scan# 21
Delta R.T. -0.000 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:244 Resp: 2470

Ion	Ratio	Lower	Upper
244	100		
212	17.5	19.0	28.6#
122	21.3	22.5	33.7#

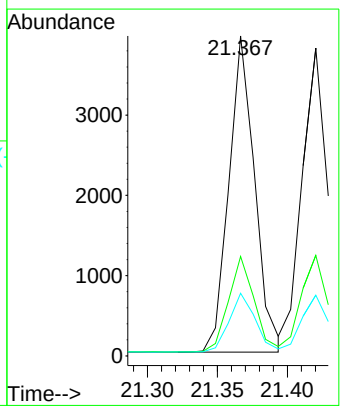


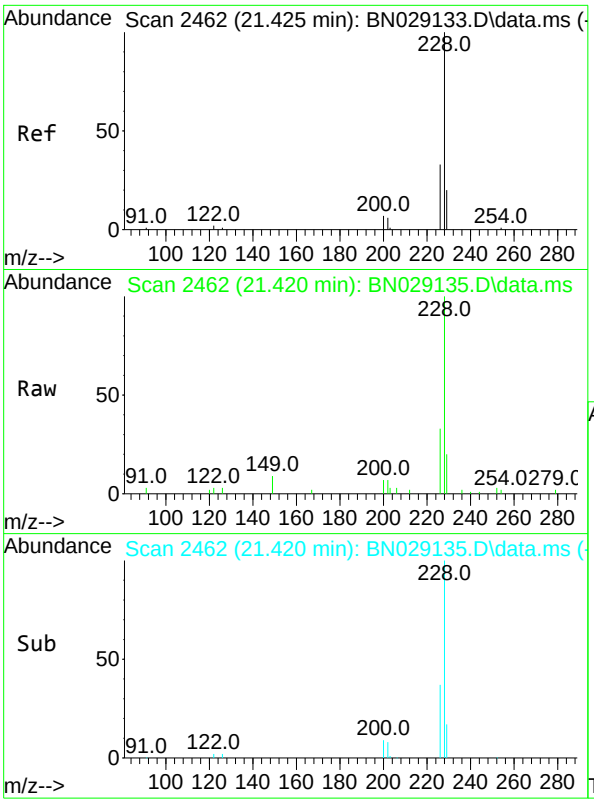


#32
Benzo(a)anthracene
Concen: 1.621 ng
RT: 21.367 min Scan# 2456
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:228 Resp: 5053

Ion	Ratio	Lower	Upper
228	100		
226	31.1	27.6	41.4
229	19.6	19.4	29.0



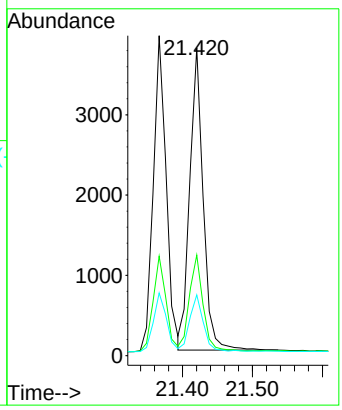


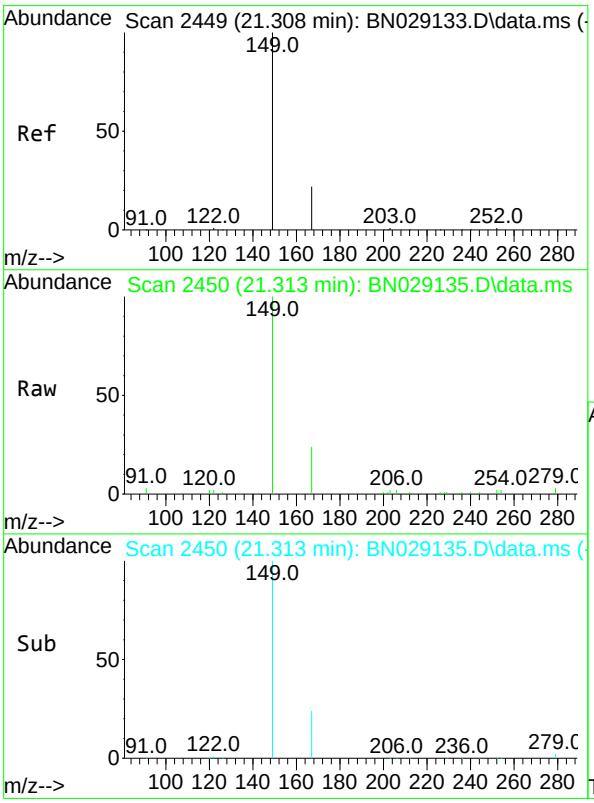
#33
Chrysene
Concen: 1.630 ng
RT: 21.420 min Scan# 24
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:228 Resp: 5026

Ion	Ratio	Lower	Upper
228	100		
226	32.7	29.2	43.8
229	19.8	19.3	28.9

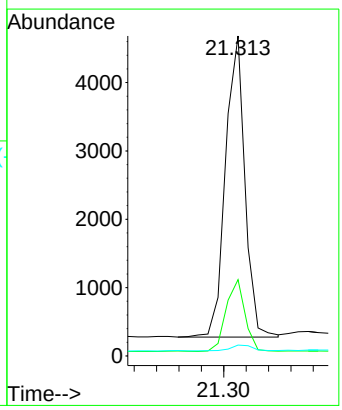


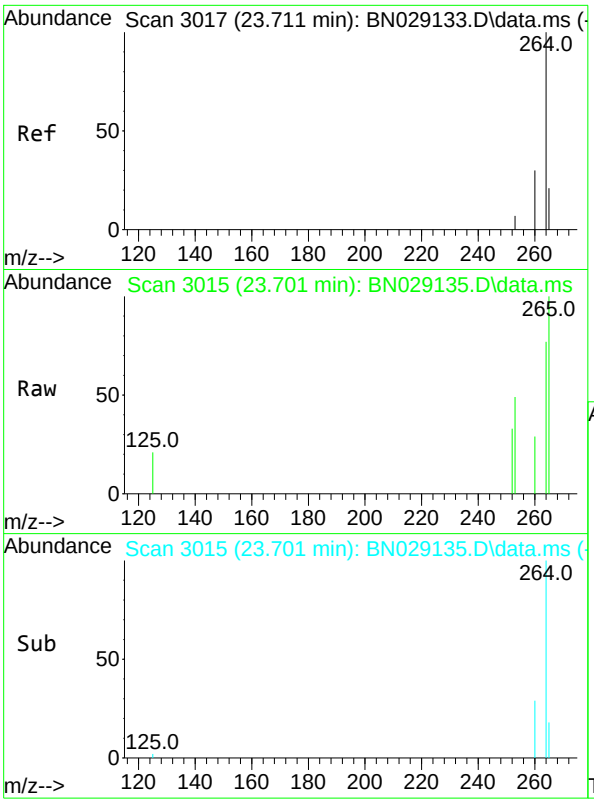


#34
Bis(2-ethylhexyl)phthalate
Concen: 1.629 ng
RT: 21.313 min Scan# 2450
Delta R.T. 0.004 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:149 Resp: 5312

Ion	Ratio	Lower	Upper
149	100		
167	23.3	20.7	31.1
279	2.3	2.5	3.7#



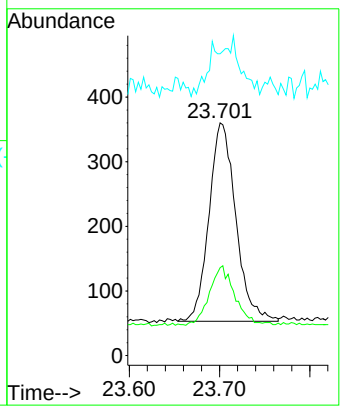


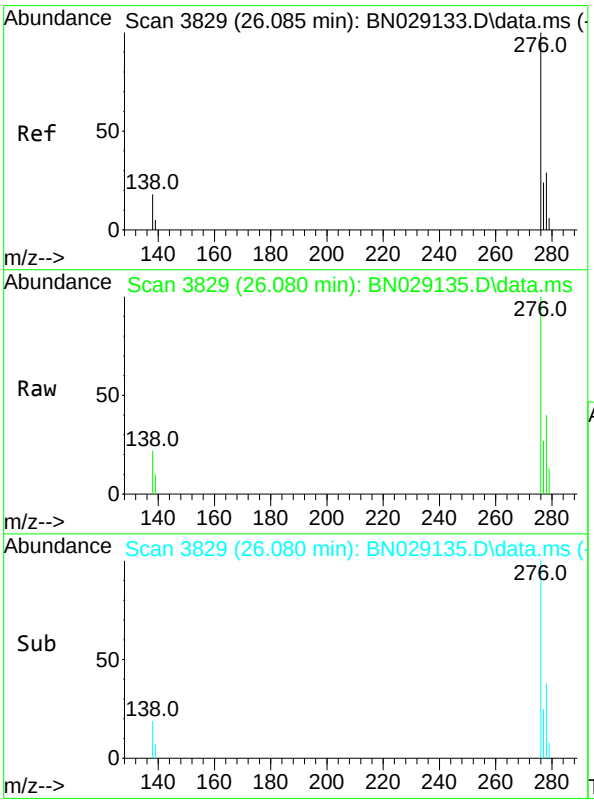
#35
Perylene-d12
Concen: 0.400 ng
RT: 23.701 min Scan# 3
Delta R.T. -0.010 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:264 Resp: 634

Ion	Ratio	Lower	Upper
264	100		
260	37.8	31.0	46.6
265	129.7	105.3	157.9

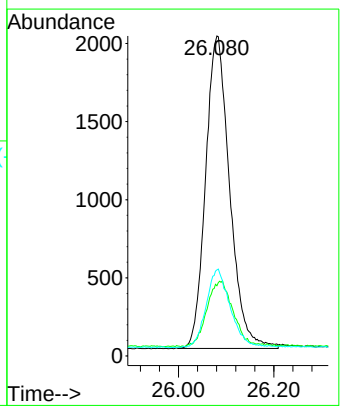


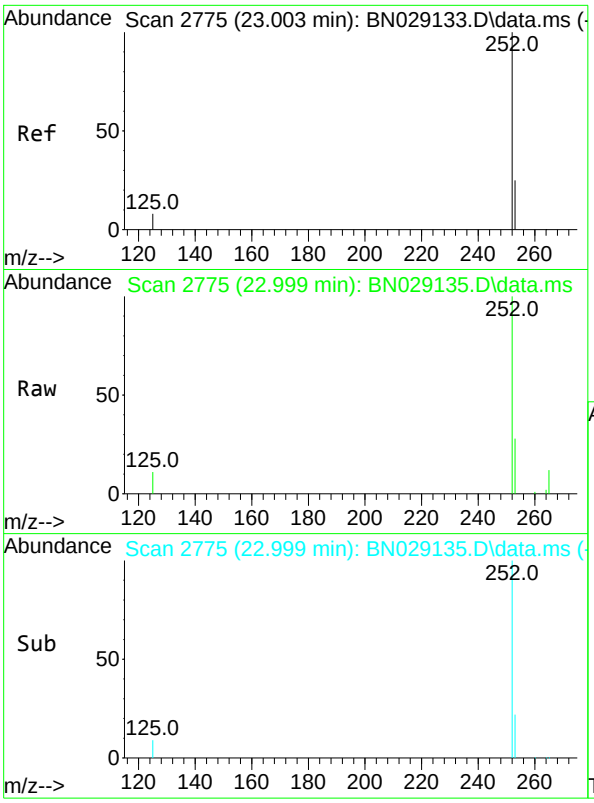


#36
Indeno(1,2,3-cd)pyrene
Concen: 1.730 ng
RT: 26.080 min Scan# 3829
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:276 Resp: 7028

Ion	Ratio	Lower	Upper
276	100		
138	23.0	7.8	11.6#
277	24.6	9.2	13.8#



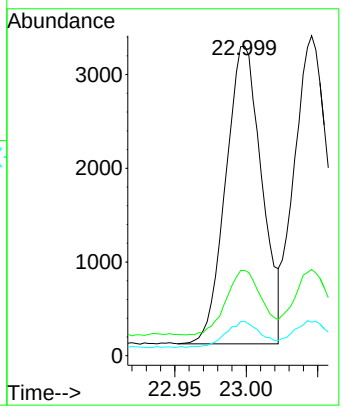


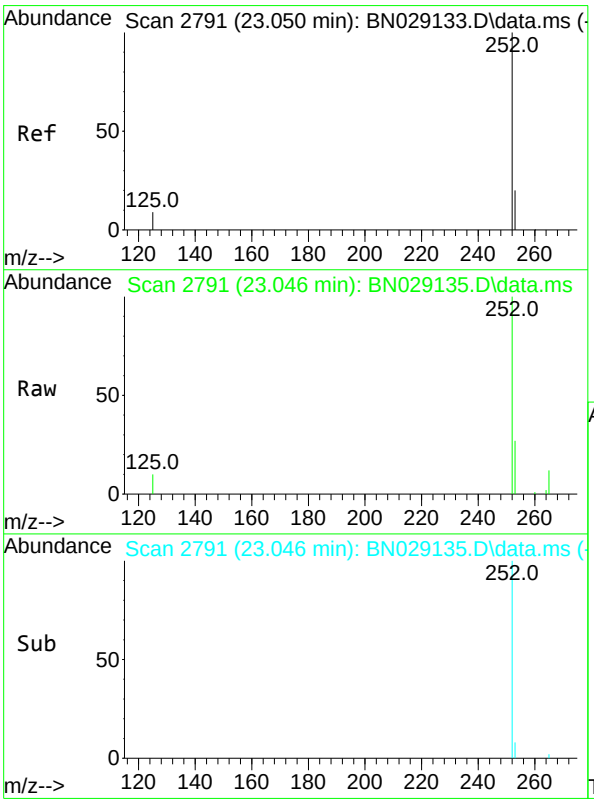
#37
Benzo(b)fluoranthene
Concen: 1.734 ng
RT: 22.999 min Scan# 2
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:252 Resp: 5592

Ion	Ratio	Lower	Upper
252	100		
253	27.6	36.0	54.0#
125	11.1	14.6	21.8#

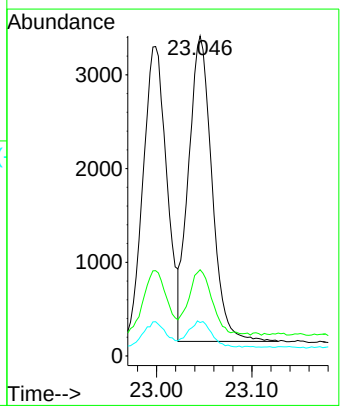


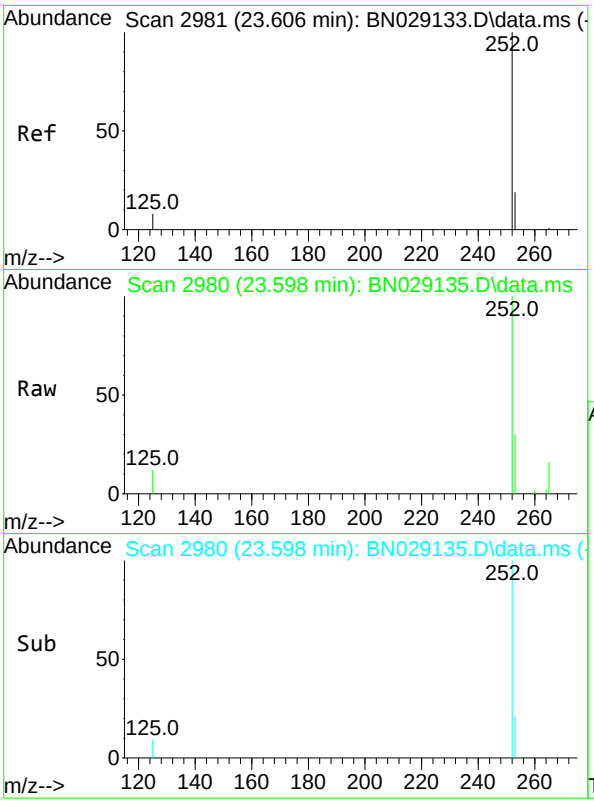


#38
Benzo(k)fluoranthene
Concen: 1.763 ng
RT: 23.046 min Scan# 2791
Delta R.T. -0.005 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:252 Resp: 5566

Ion	Ratio	Lower	Upper
252	100		
253	26.9	35.0	52.6#
125	10.5	14.6	21.8#



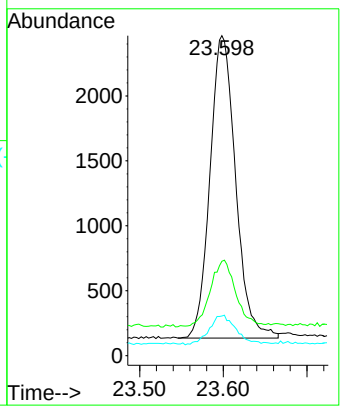


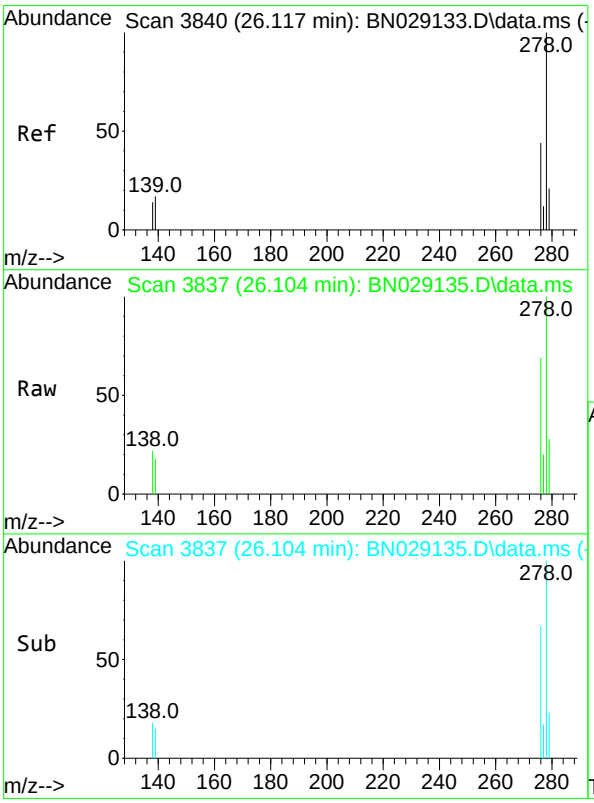
#39
Benzo(a)pyrene
Concen: 1.724 ng
RT: 23.598 min Scan# 2
Delta R.T. -0.007 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:252 Resp: 4962

Ion	Ratio	Lower	Upper
252	100		
253	29.5	40.3	60.5#
125	12.4	16.7	25.1#

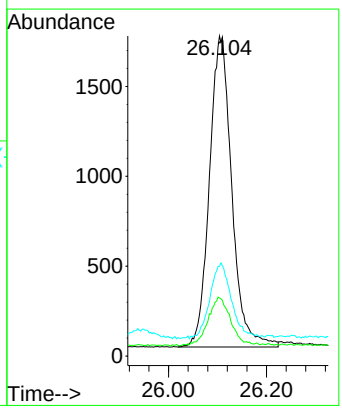


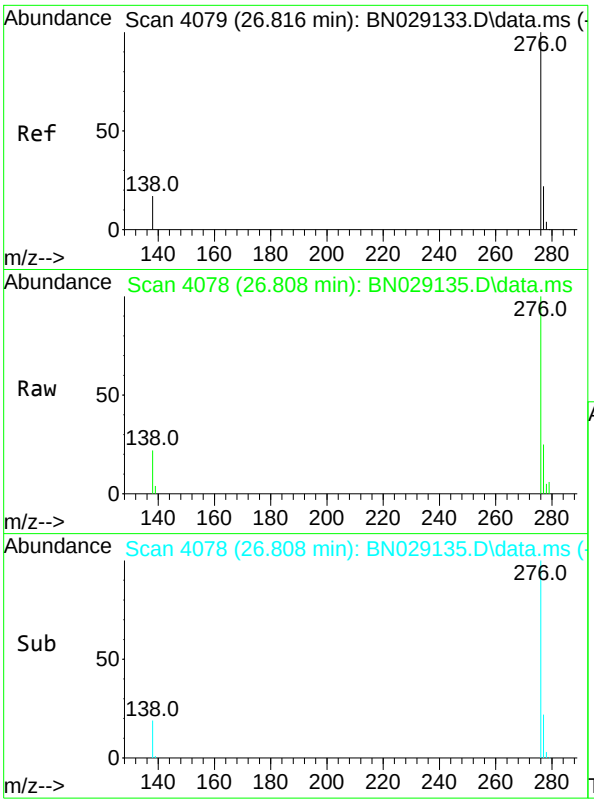


#40
Dibenzo(a,h)anthracene
Concen: 1.750 ng
RT: 26.104 min Scan# 3837
Delta R.T. -0.013 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Tgt Ion:278 Resp: 5496

Ion	Ratio	Lower	Upper
278	100		
139	18.2	24.2	36.2#
279	28.0	34.9	52.3#





#41
Benzo(g,h,i)perylene
Concen: 1.719 ng
RT: 26.808 min Scan# 4
Delta R.T. -0.007 min
Lab File: BN029135.D
Acq: 20 Dec 2023 15:26

Instrument :
BNA_N
ClientSampleId :
SSTDICC1.6

Tgt Ion:276 Resp: 5945

Ion	Ratio	Lower	Upper
276	100		
277	24.8	25.5	38.3#
138	22.1	22.9	34.3#