

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (QT Reviewed)

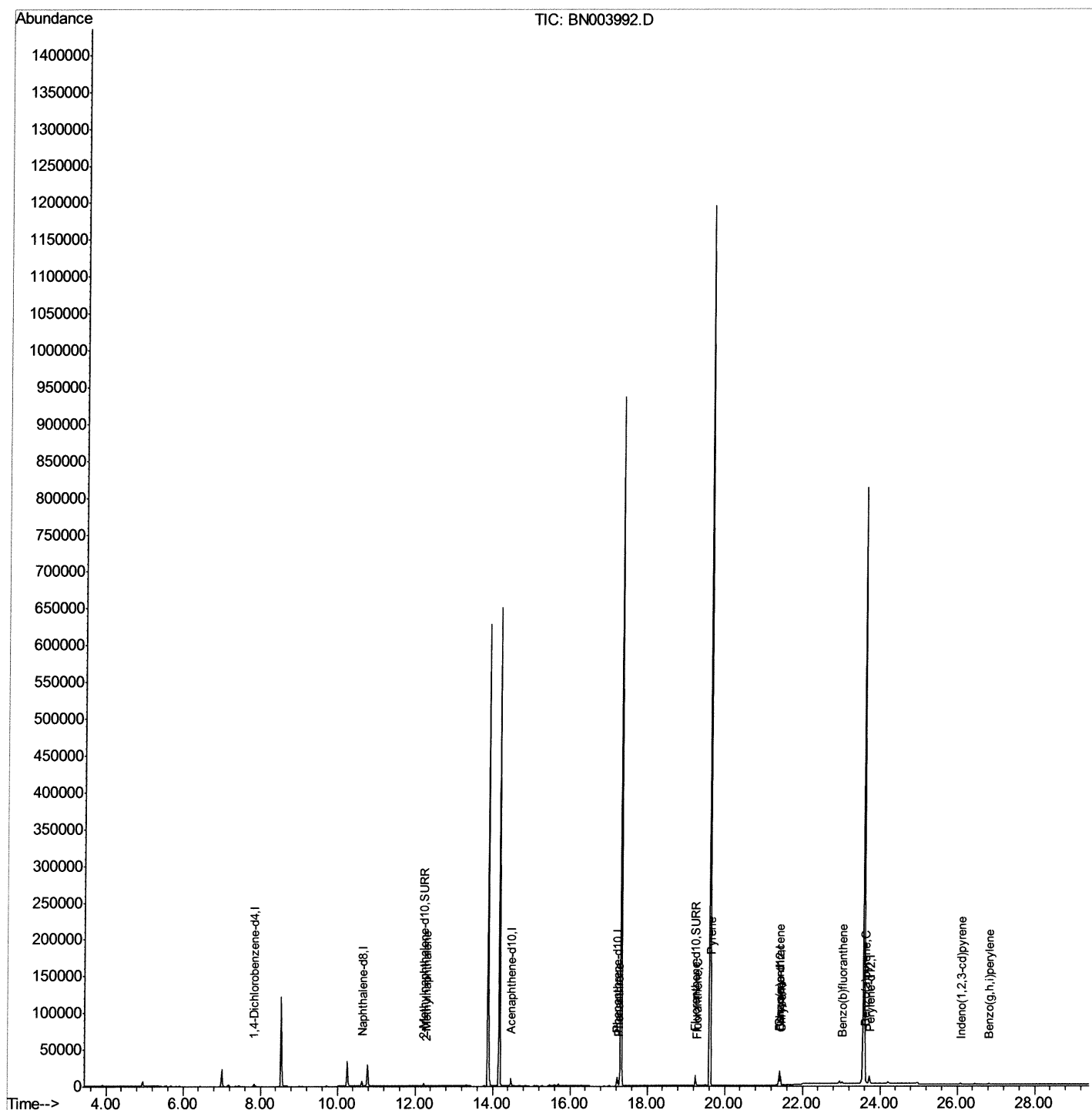
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:29:56 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

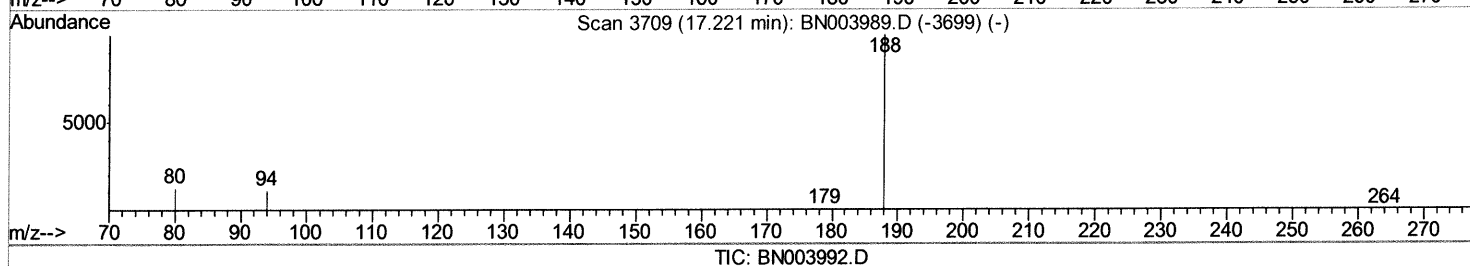
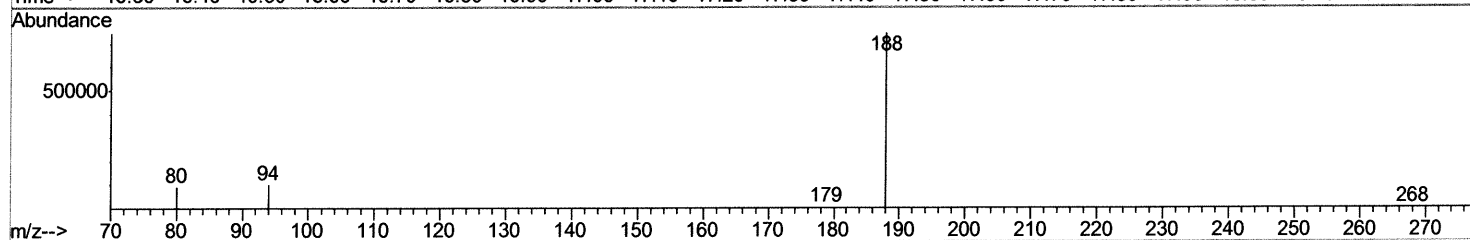
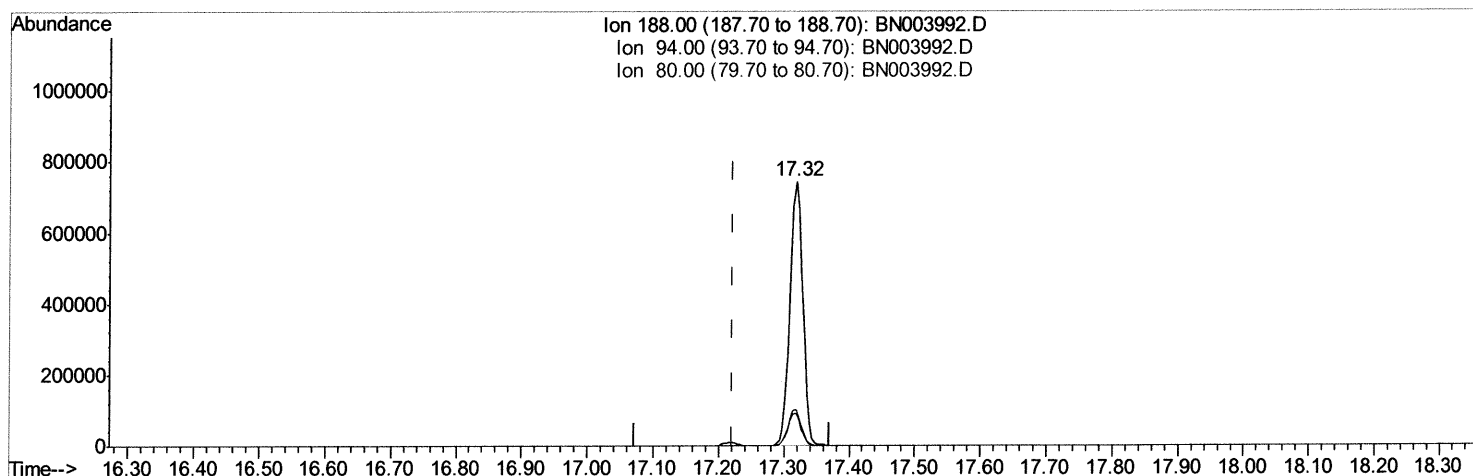
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:09:45 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(10) Phenanthrene-d10 (I)
17.318min (+0.097) 0.40ng/ul
response 1020964

Ion	Exp%	Act%
188.00	100	100
94.00	10.40	13.59#
80.00	11.60	12.20
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

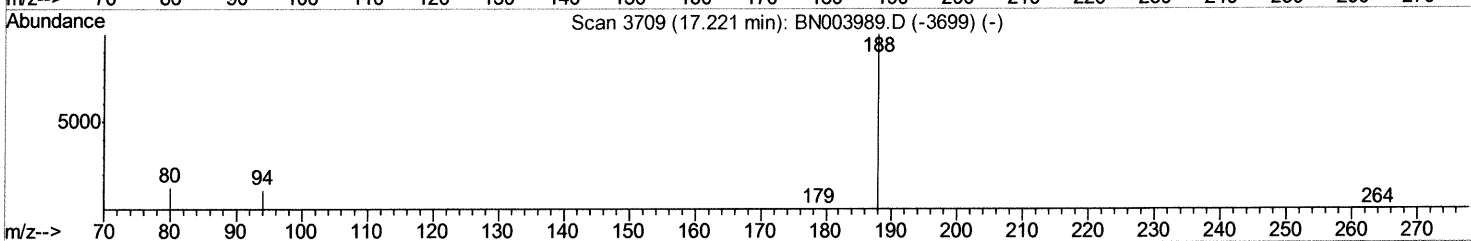
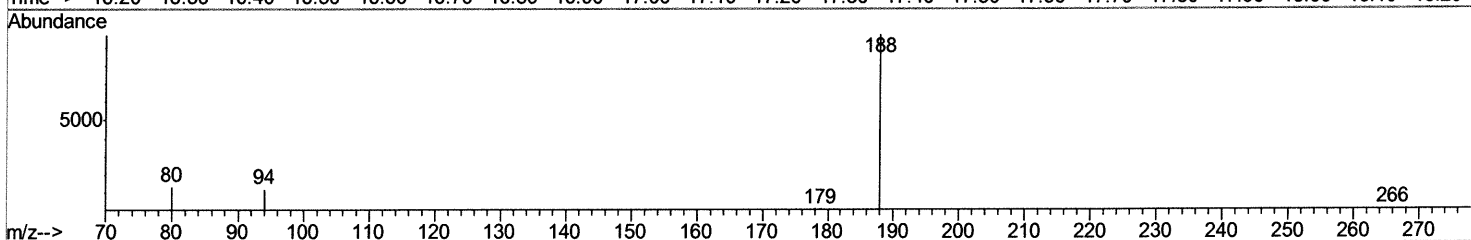
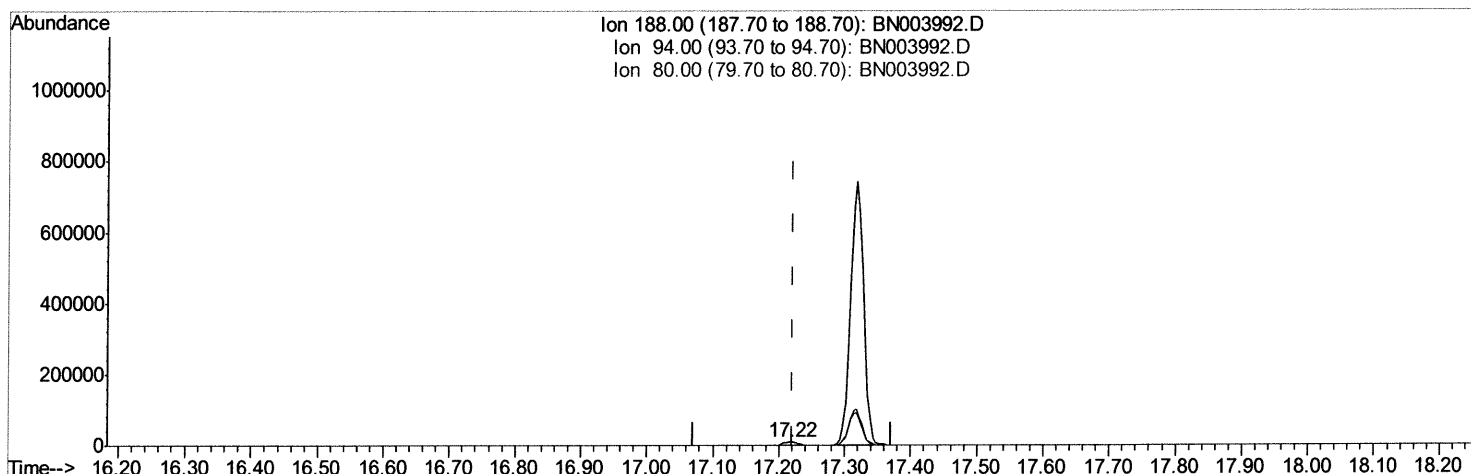
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:09:45 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(10) Phenanthrene-d10 (I)

17.217min (-0.004) 0.40ng/ul m

response 13851

Ion	Exp%	Act%
188.00	100	100
94.00	10.40	12.47
80.00	11.60	13.57
0.00	0.00	0.00

> SJ
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

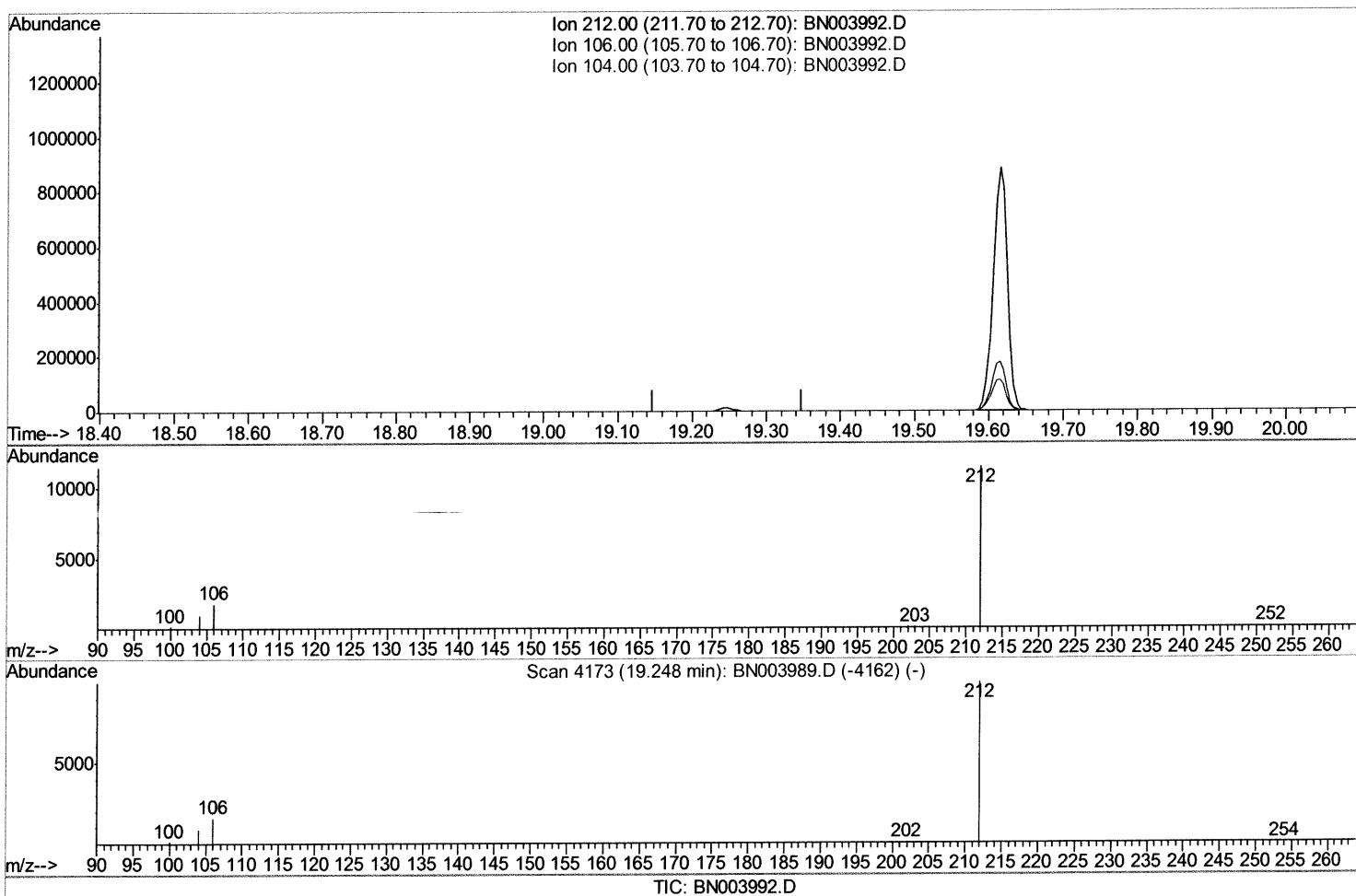
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:26:08 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(14) Fluoranthene-d10 (SURR)

19.248min (-19.248) 0.00ng/ul

response 0

Ion	Exp%	Act%
212.00	100	0.00
106.00	14.20	0.00#
104.00	8.00	0.00#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

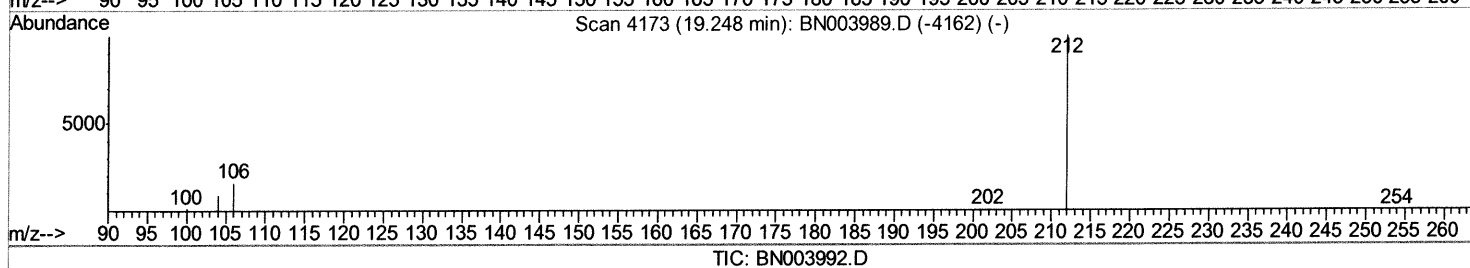
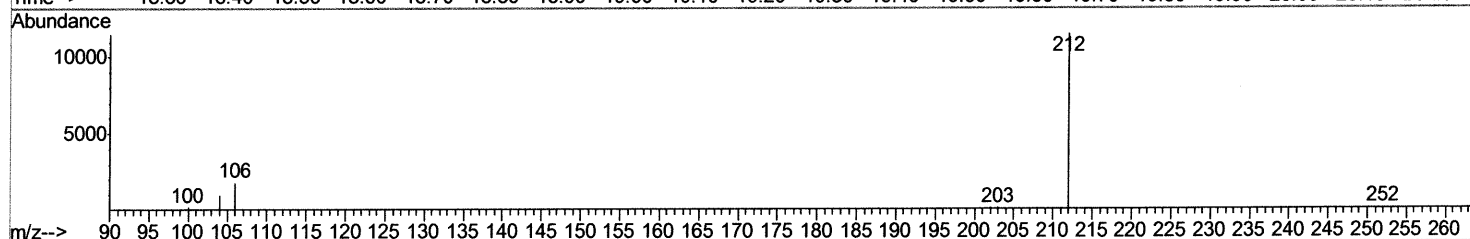
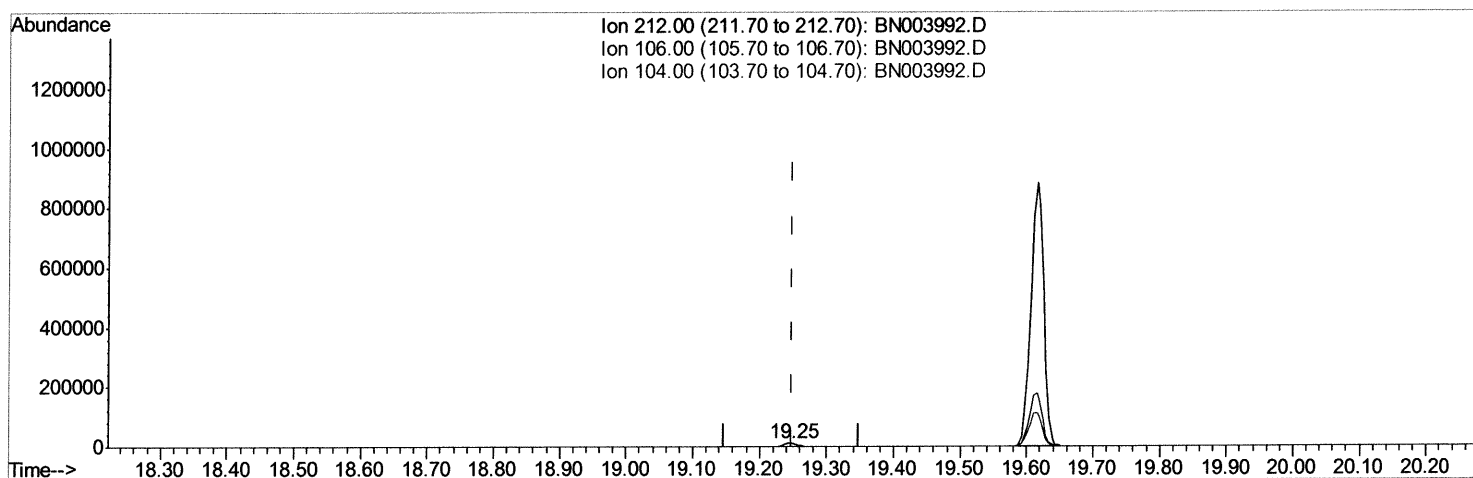
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:26:08 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(14) Fluoranthene-d10 (SURR)

19.248min (-0.000) 0.37ng/ul m

response 15184

Ion	Exp%	Act%
212.00	100	100
106.00	14.20	0.00#
104.00	8.00	0.00#
0.00	0.00	0.00

> SJ
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

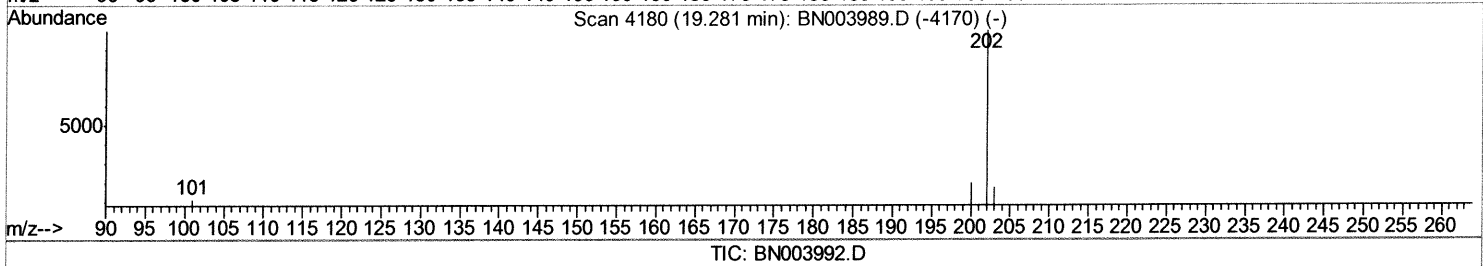
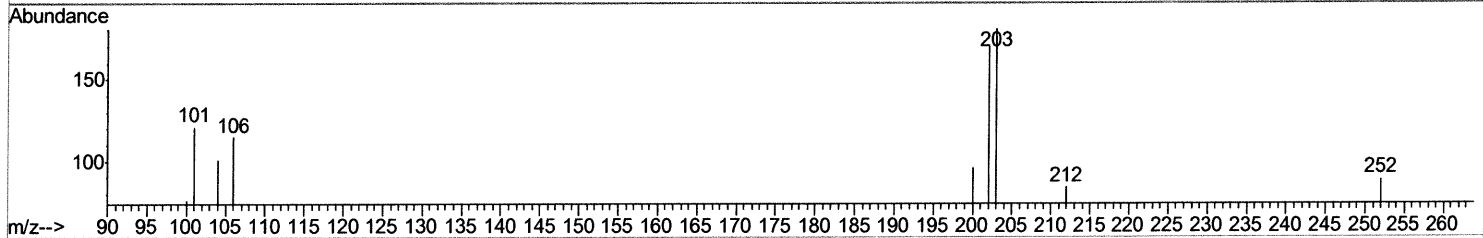
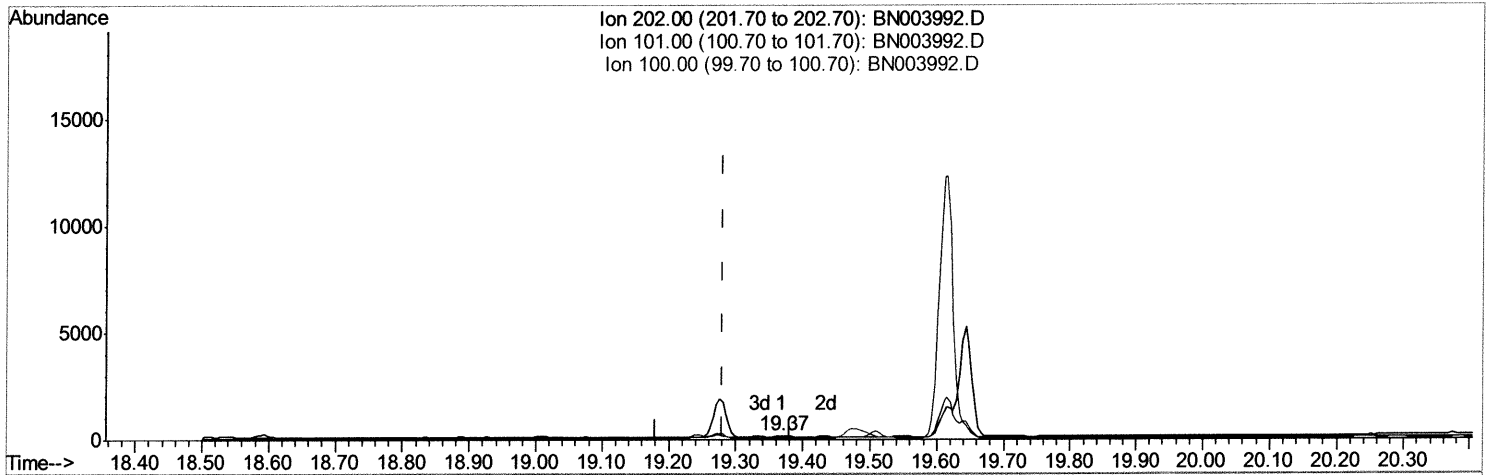
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:26:08 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(15) Fluoranthene (C)

19.369min (+0.088) 0.00ng/ul

response 59

Ion	Exp%	Act%
202.00	100	100
101.00	10.70	71.18#
100.00	8.10	44.71#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

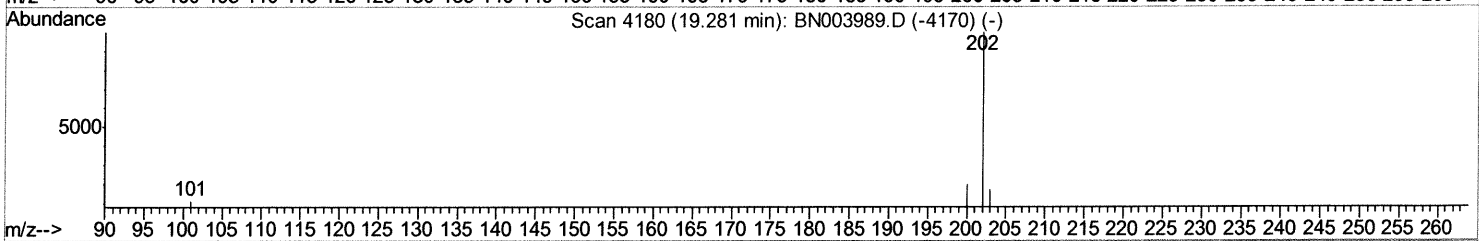
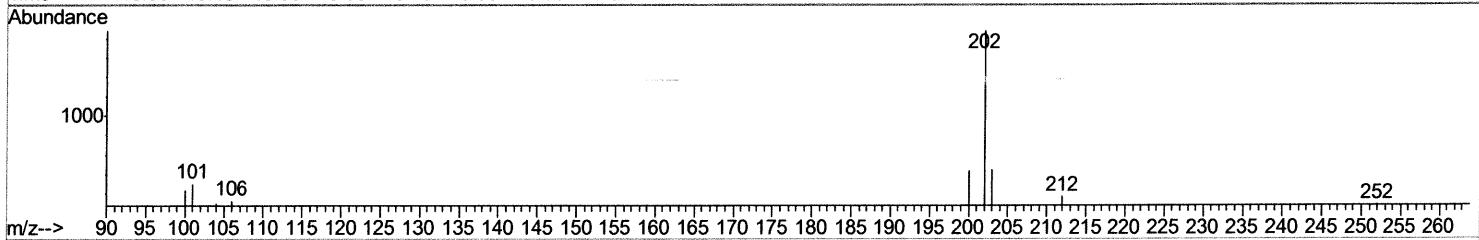
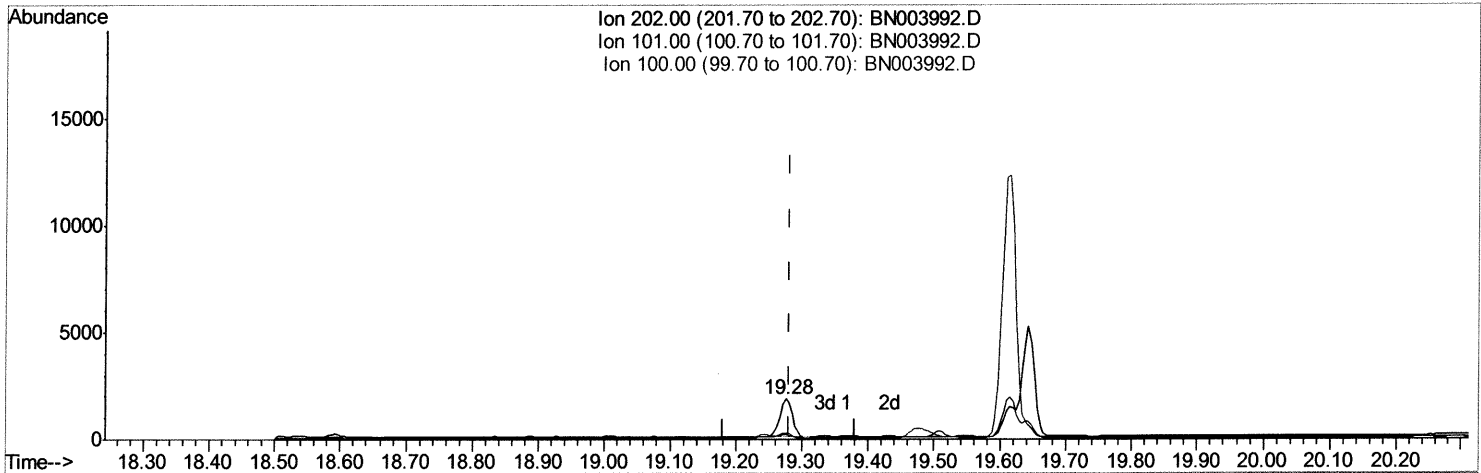
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:26:08 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(15) Fluoranthene (C)

19.276min (-0.005) 0.05ng/ul m

response 2444

Ion	Exp%	Act%
202.00	100	100
101.00	10.70	15.94
100.00	8.10	12.43
0.00	0.00	0.00

> SJ
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

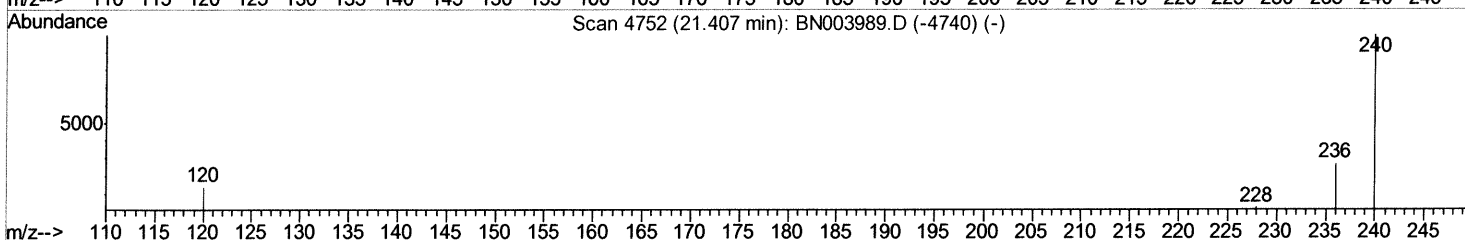
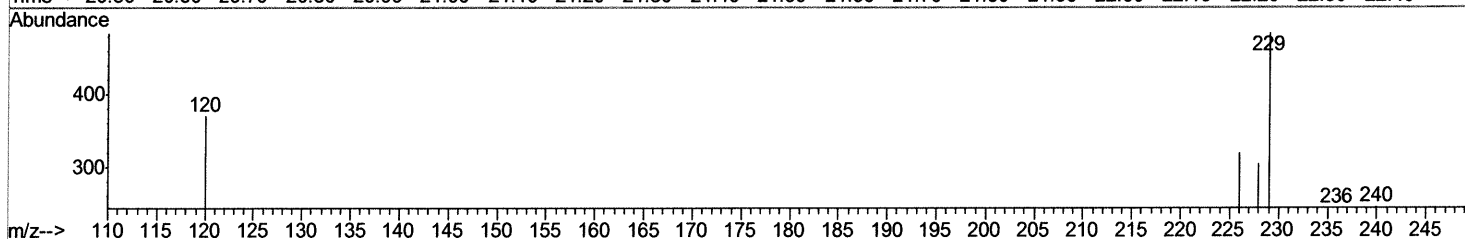
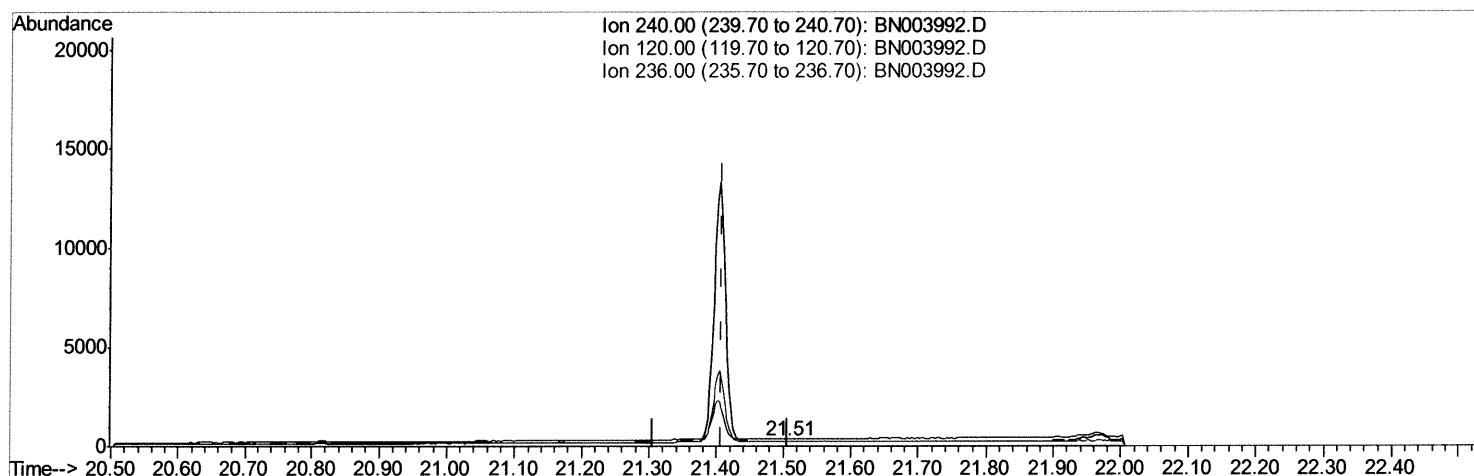
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:26:08 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(16) Chrysene-d12 (I)

21.506min (+0.099) 0.40ng/ul

response 26

Ion	Exp%	Act%
240.00	100	100
120.00	14.00	151.64#
236.00	27.60	99.59#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

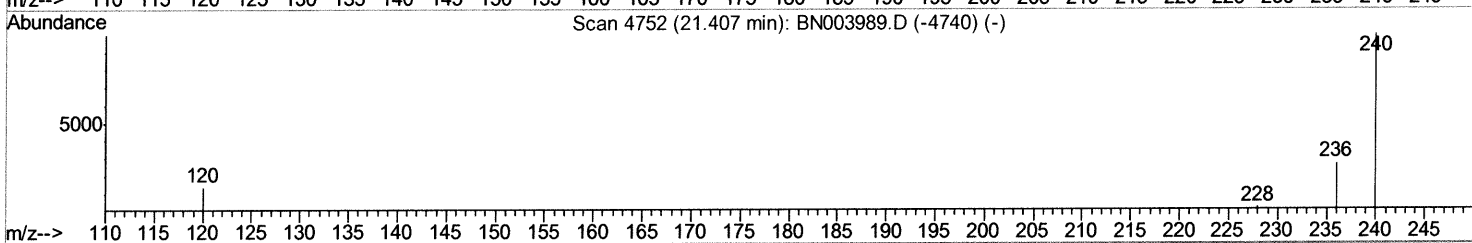
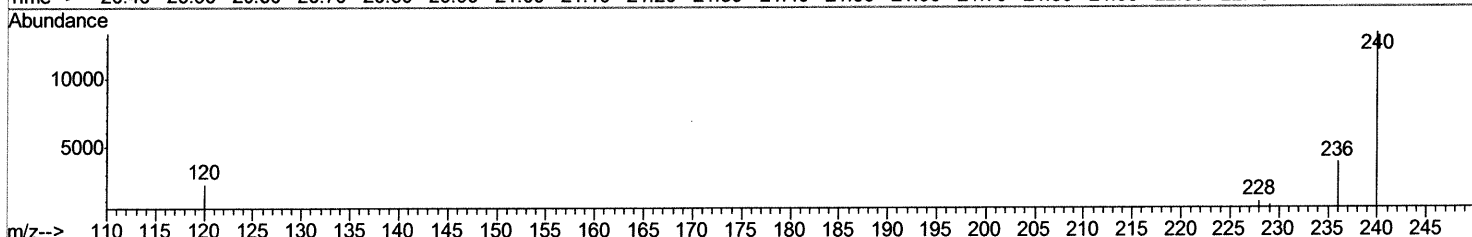
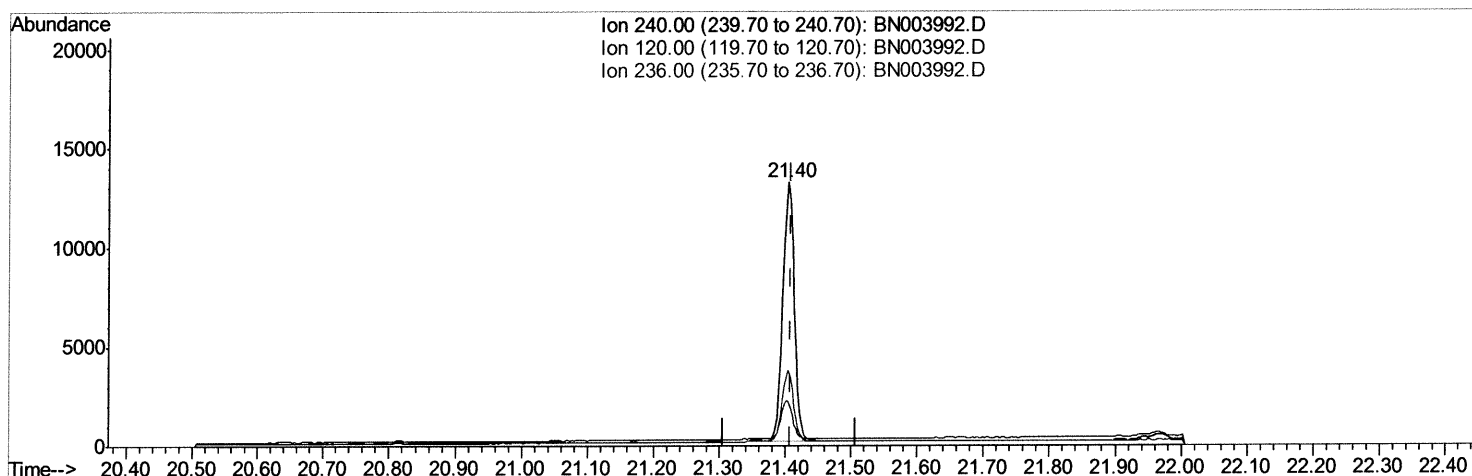
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:26:08 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(16) Chrysene-d12 (I)

21.404min (-0.003) 0.40ng/ul m

response 15695

Ion	Exp%	Act%
240.00	100	100
120.00	14.00	16.98#
236.00	27.60	28.48
0.00	0.00	0.00

> SJ
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

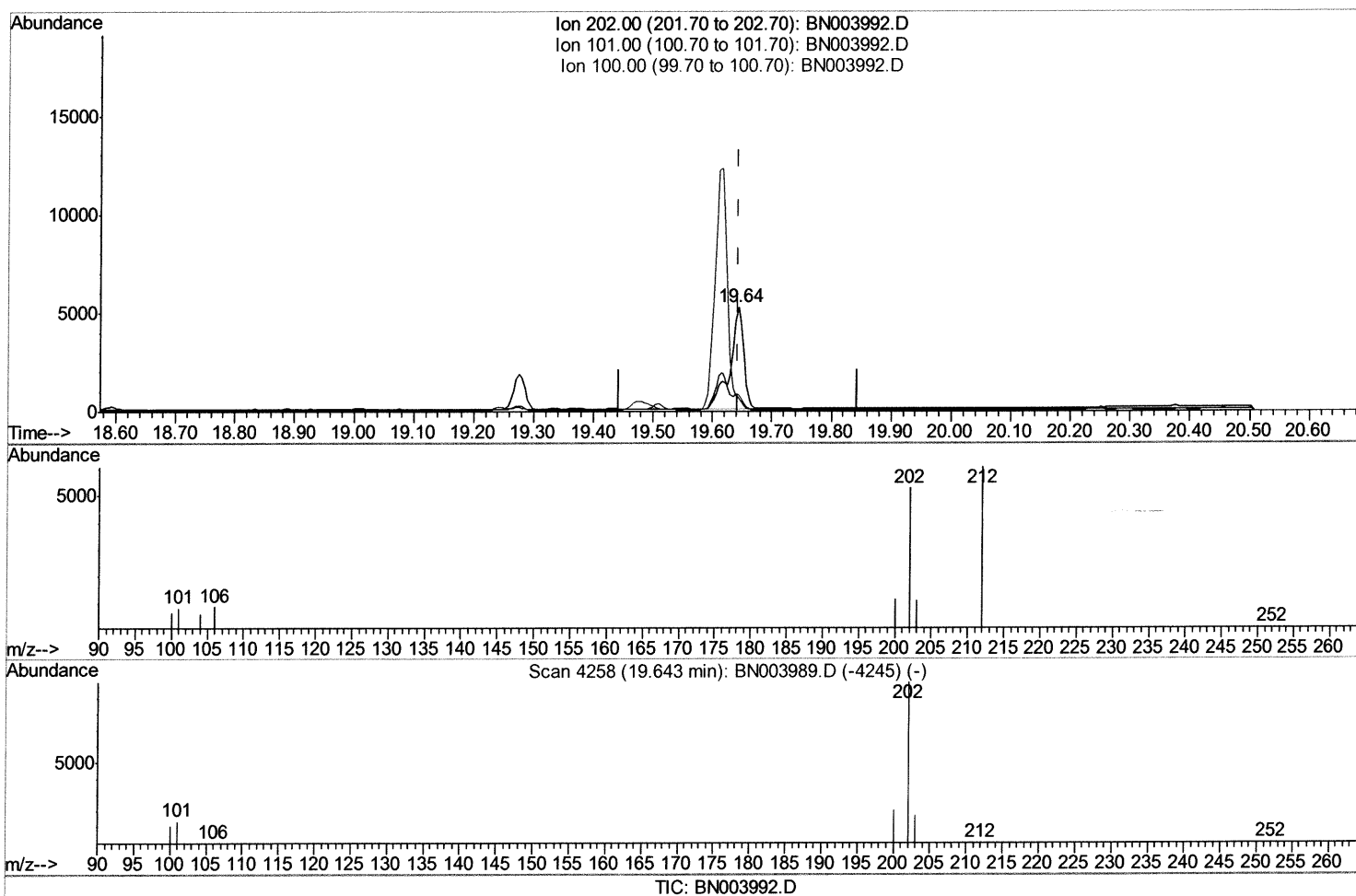
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(17) Pyrene

19.643min (-0.000) 0.15ng/ul

response 8275

Ion	Exp%	Act%
202.00	100	100
101.00	12.90	15.81#
100.00	10.60	12.61
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

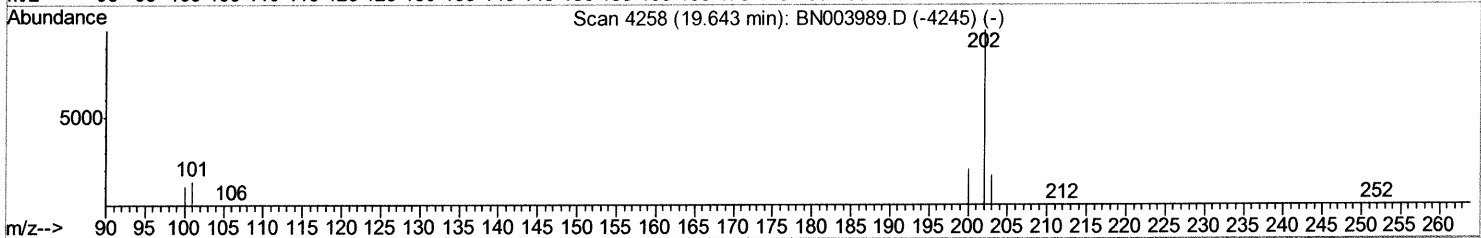
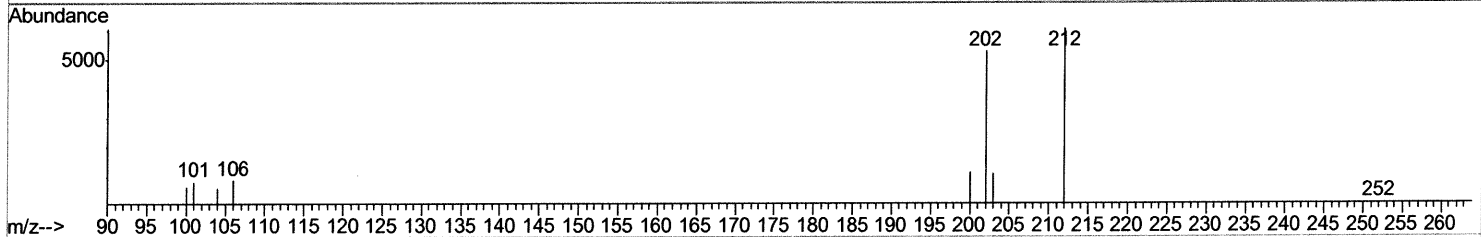
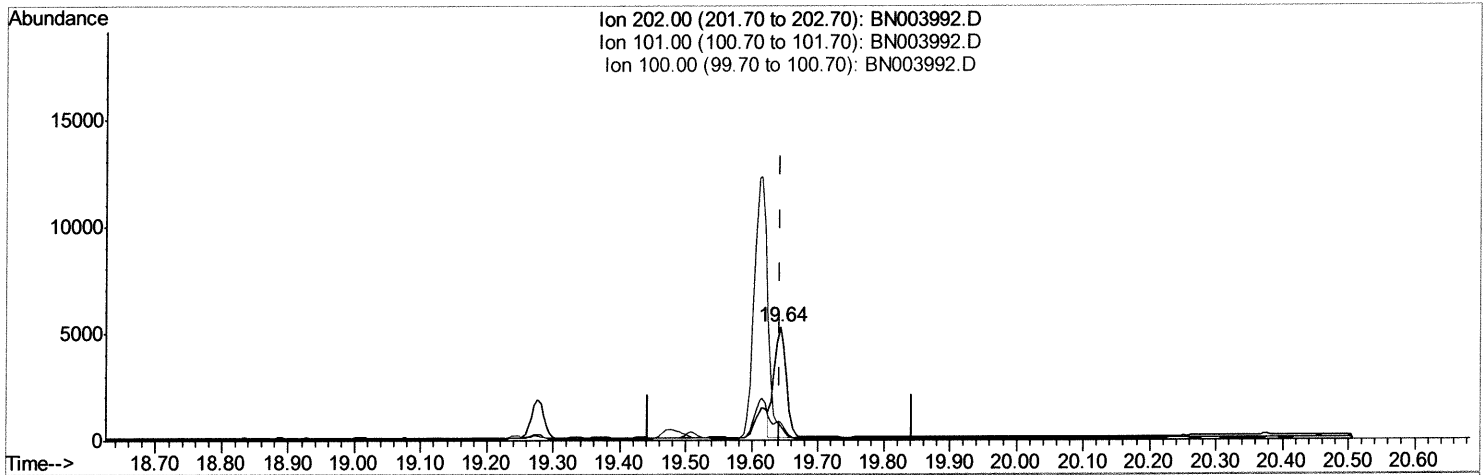
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(17) Pyrene

19.643min (-0.000) 0.11ng/ul m

response 6438

Ion	Exp%	Act%
202.00	100	100
101.00	12.90	15.81#
100.00	10.60	12.61
0.00	0.00	0.00

> 53
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

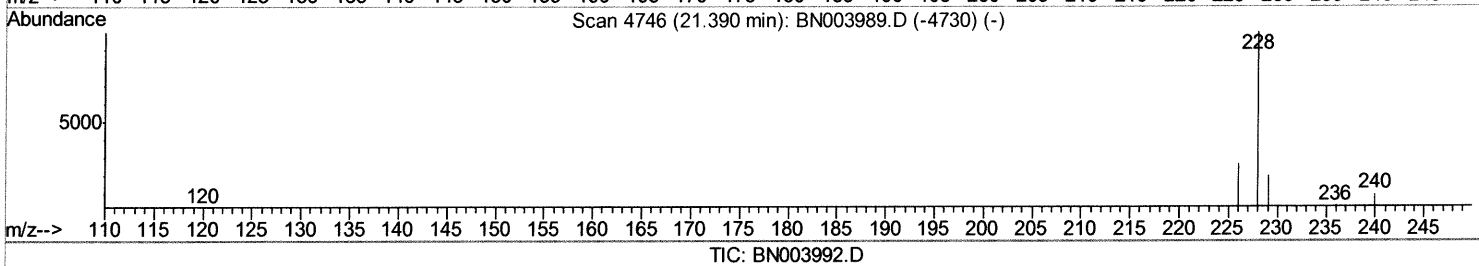
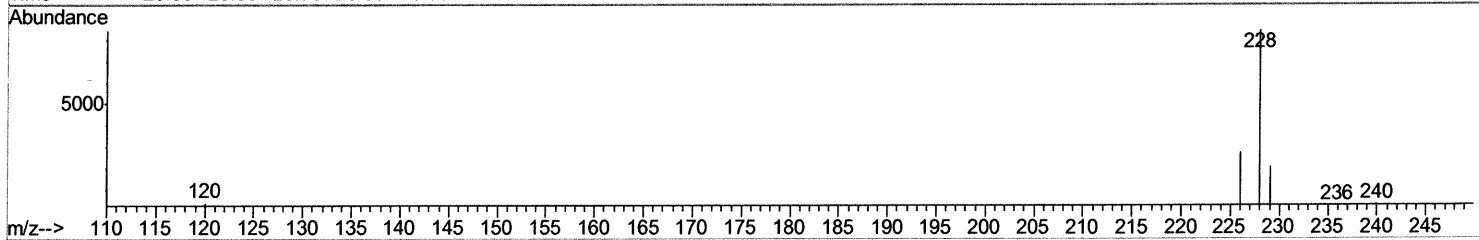
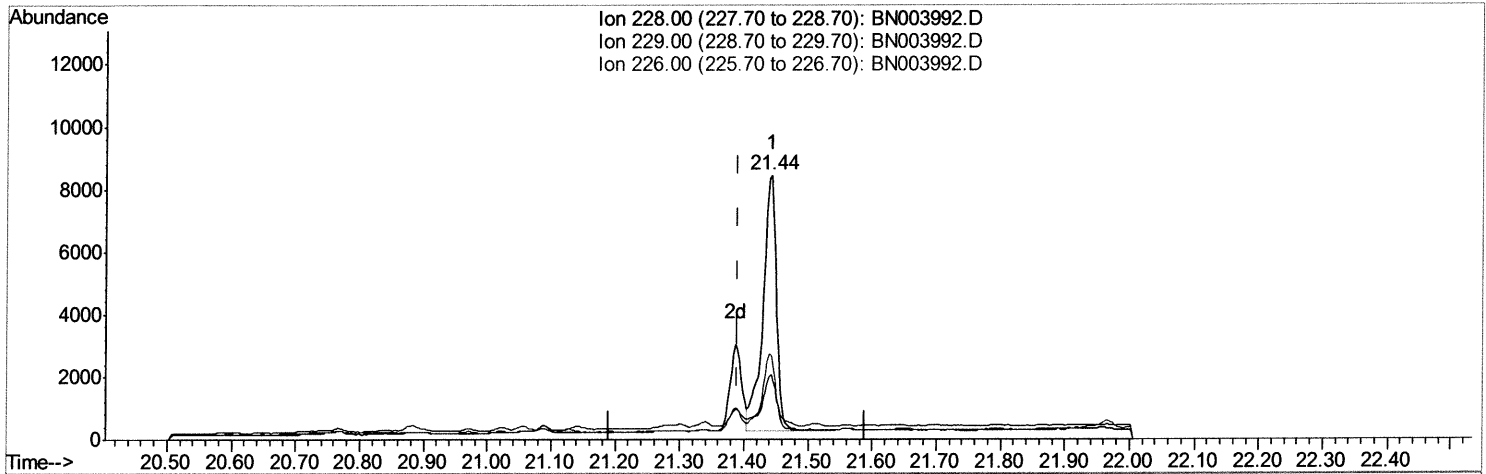
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(18) Benzo(a)anthracene
21.442min (+0.052) 0.24ng/ul
response 11910

Ion	Exp%	Act%
228.00	100	100
229.00	19.50	24.44#
226.00	26.40	31.88#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

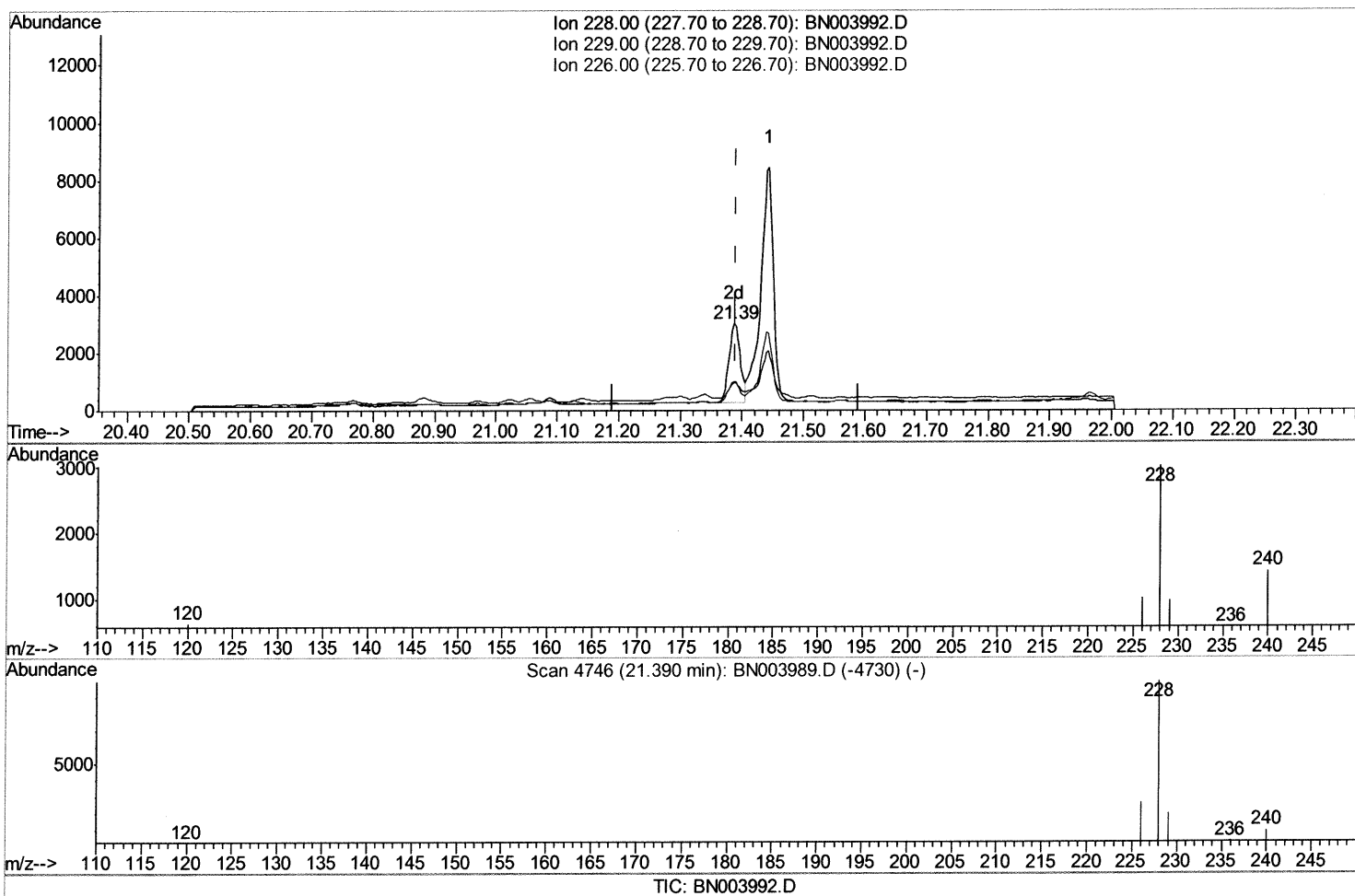
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(18) Benzo(a)anthracene

21.387min (-0.003) 0.07ng/ul m

response 3503

Ion	Exp%	Act%
228.00	100	100
229.00	19.50	32.48#
226.00	26.40	33.44#
0.00	0.00	0.00

> 53
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

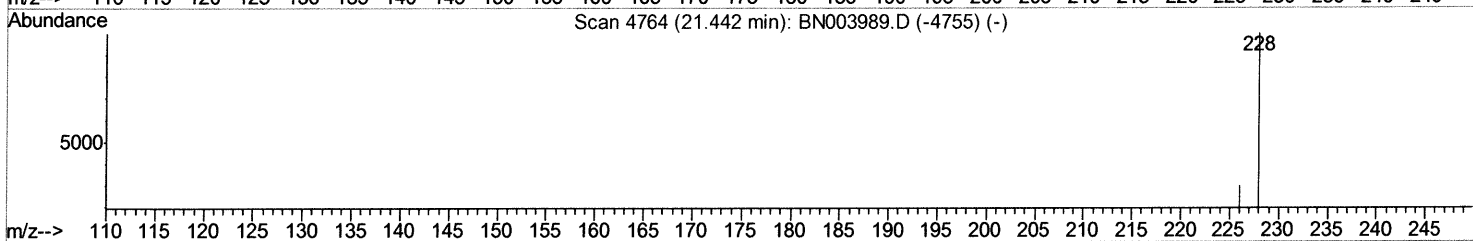
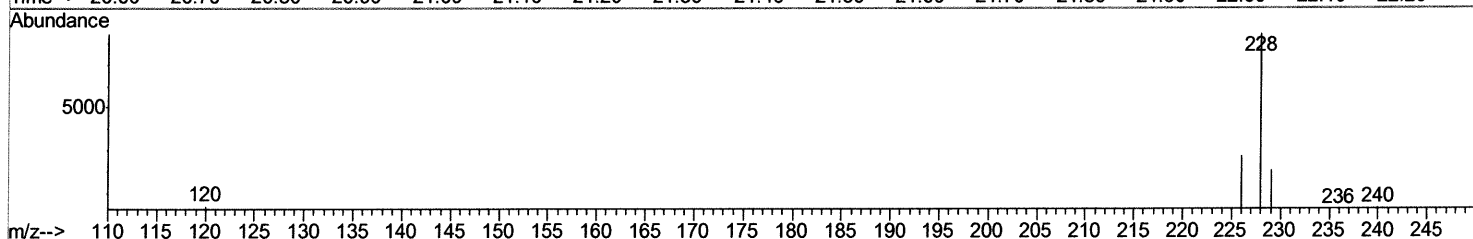
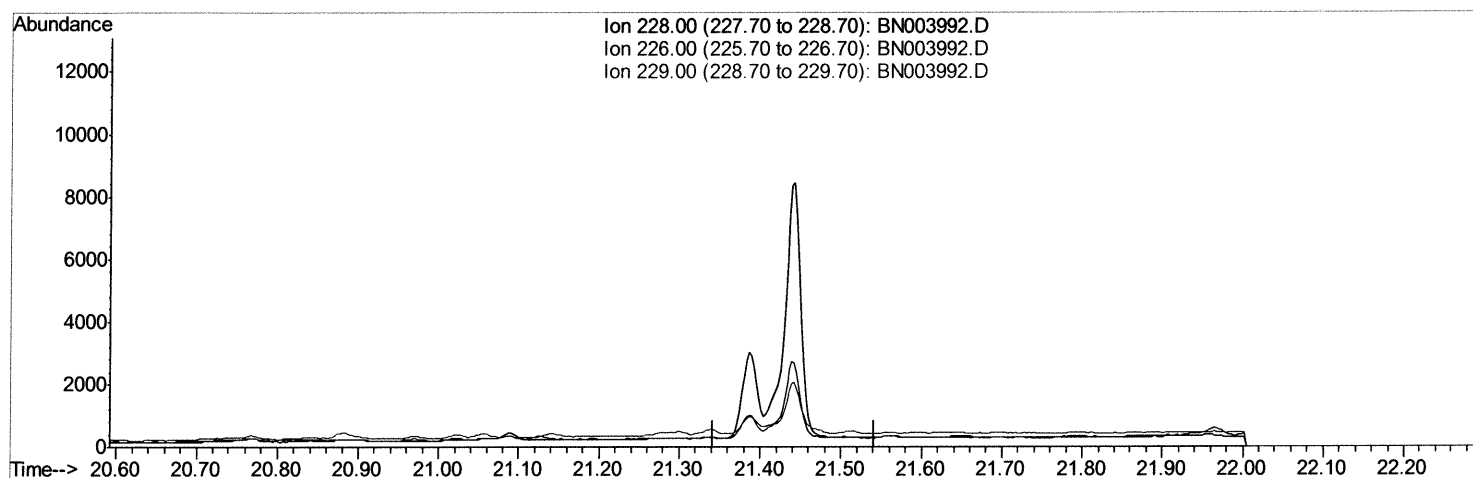
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(19) Chrysene

21.442min (-21.442) 0.00ng/ul

response 0

Ion	Exp%	Act%
228.00	100	0.00
226.00	30.00	0.00#
229.00	19.60	0.00#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

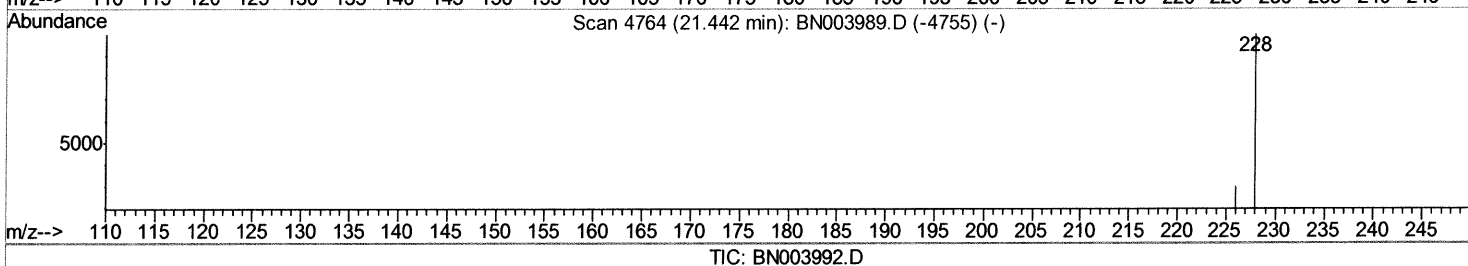
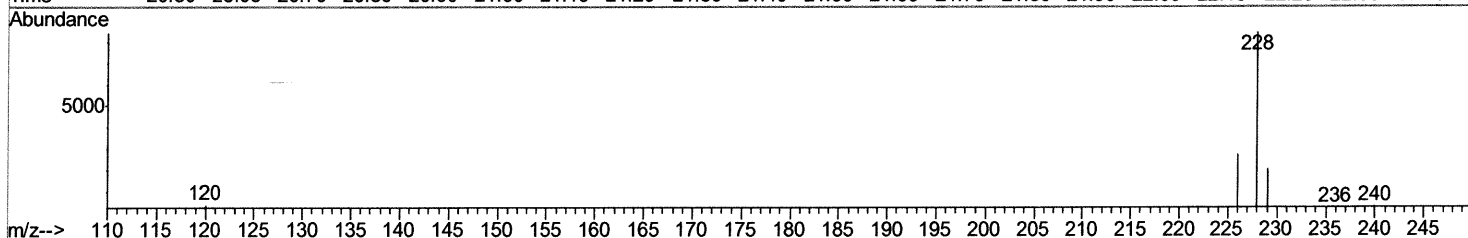
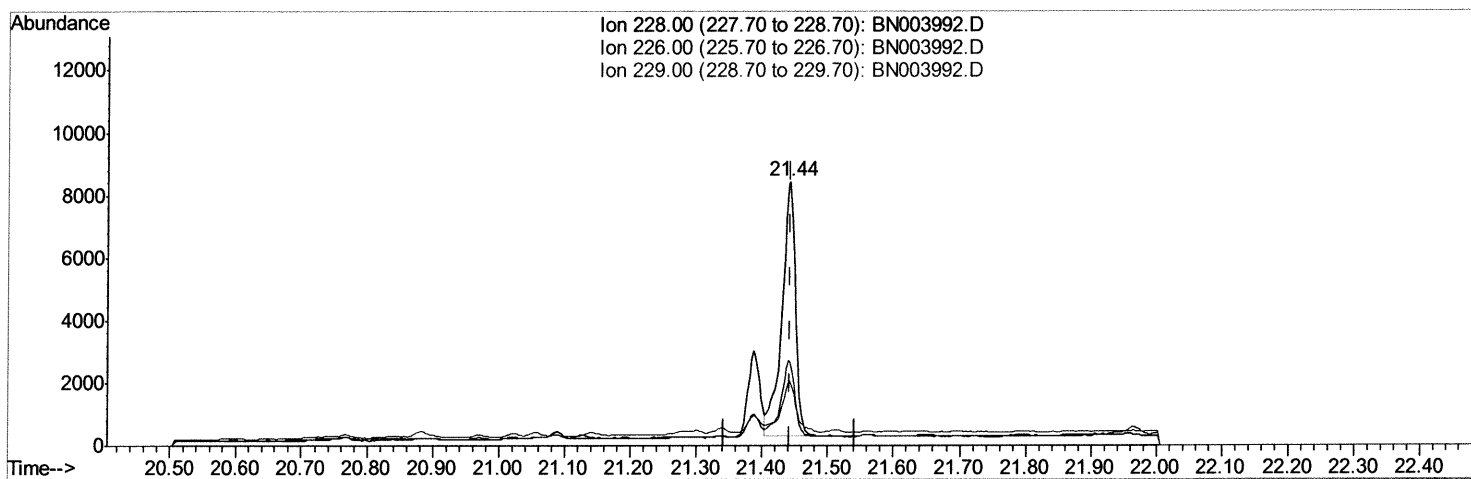
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(19) Chrysene

21.442min (-0.000) 0.21ng/ul m

response 11703

Ion	Exp%	Act%
228.00	100	100
226.00	30.00	31.88
229.00	19.60	24.44#
0.00	0.00	0.00

> SJ
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

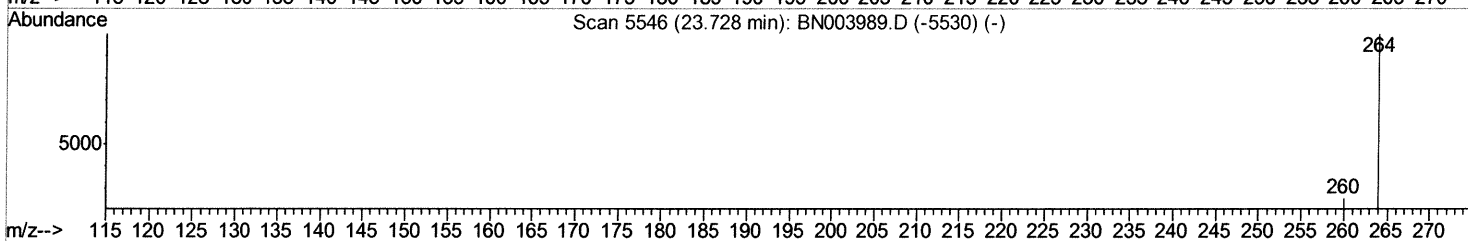
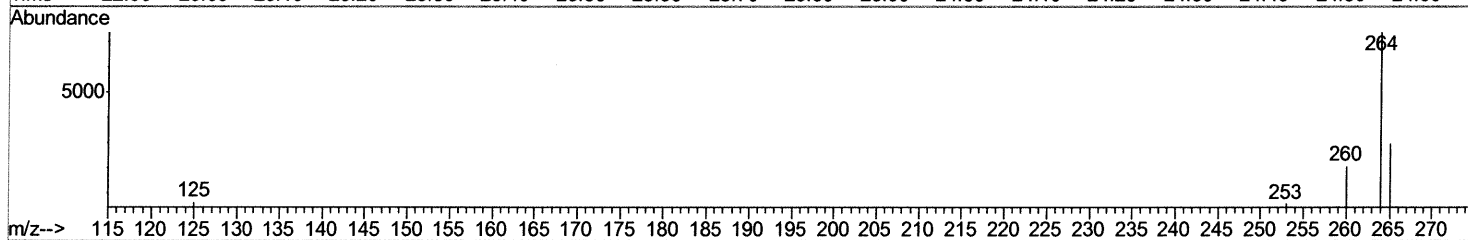
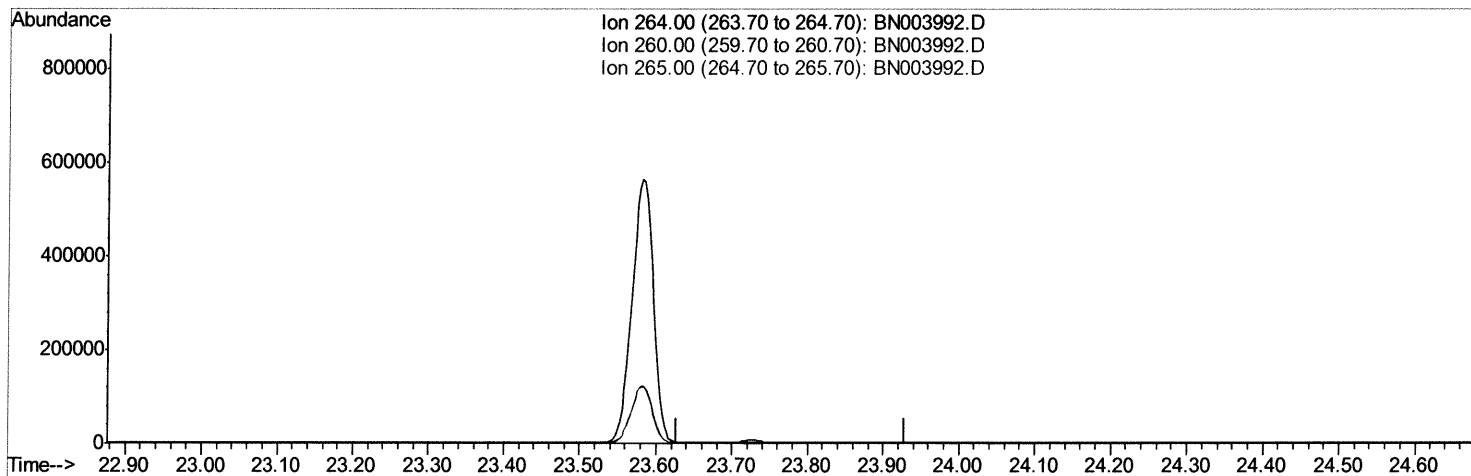
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



TIC: BN003992.D

(20) Perylene-d12 (I)

23.728min (-23.728) 0.00ng/ul

response 0

Ion	Exp%	Act%
264.00	100	0.00
260.00	26.20	0.00#
265.00	33.50	0.00#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

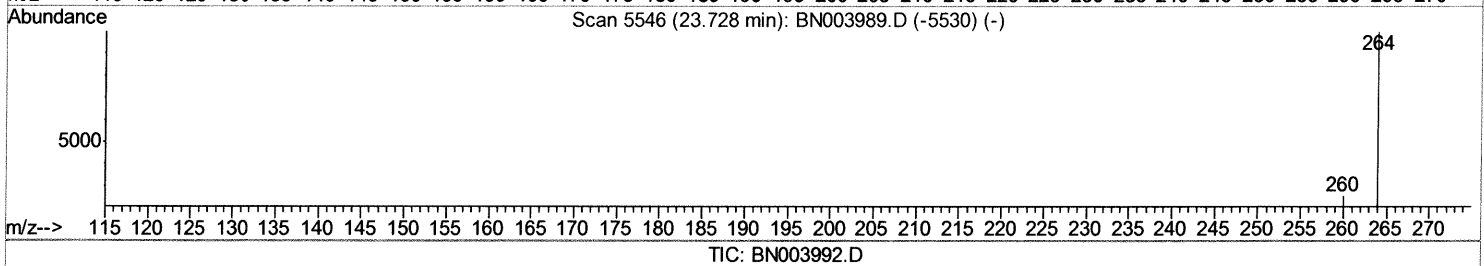
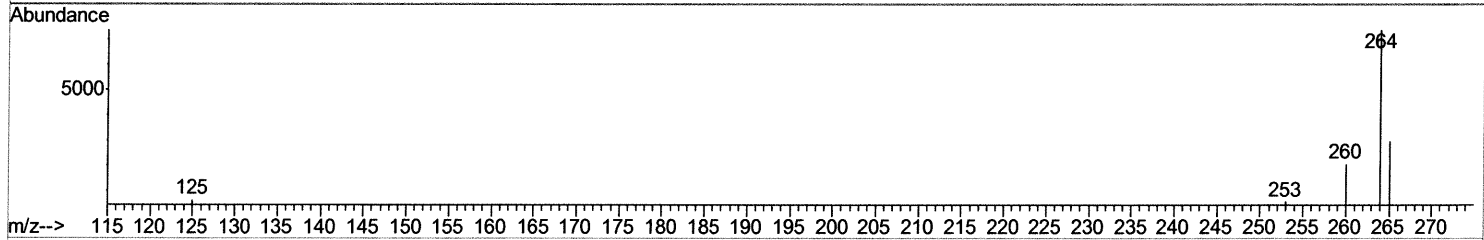
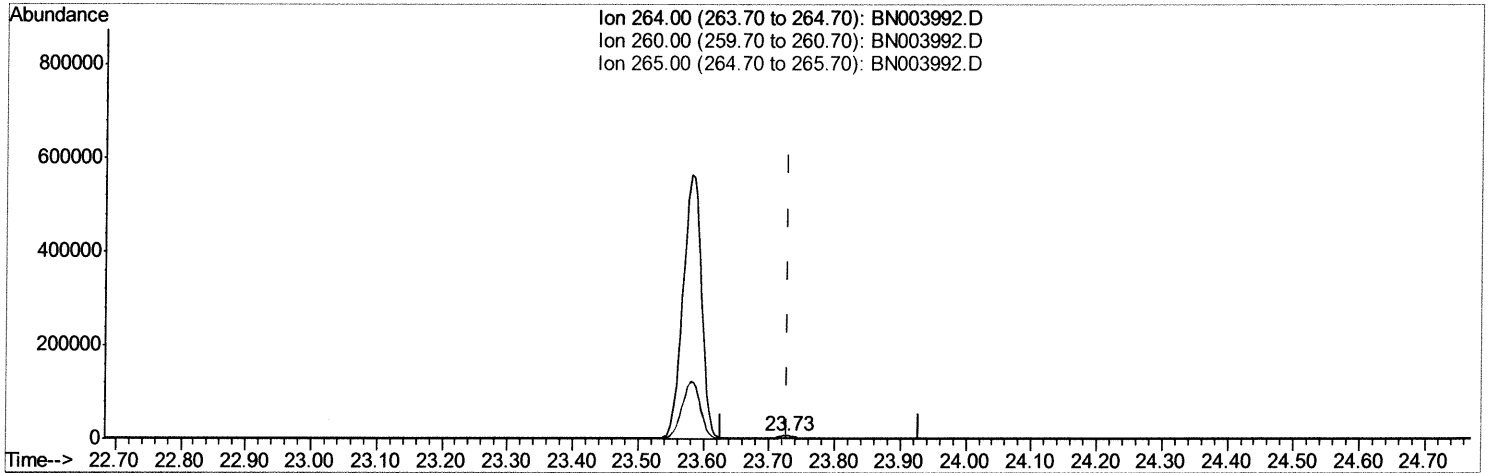
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampled :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:27:07 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(20) Perylene-d12 (I)

23.728min (-0.000) 0.40ng/ul m

response 13284

Ion	Exp%	Act%
264.00	100	100
260.00	26.20	28.16
265.00	33.50	40.21#
0.00	0.00	0.00

> SJ
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

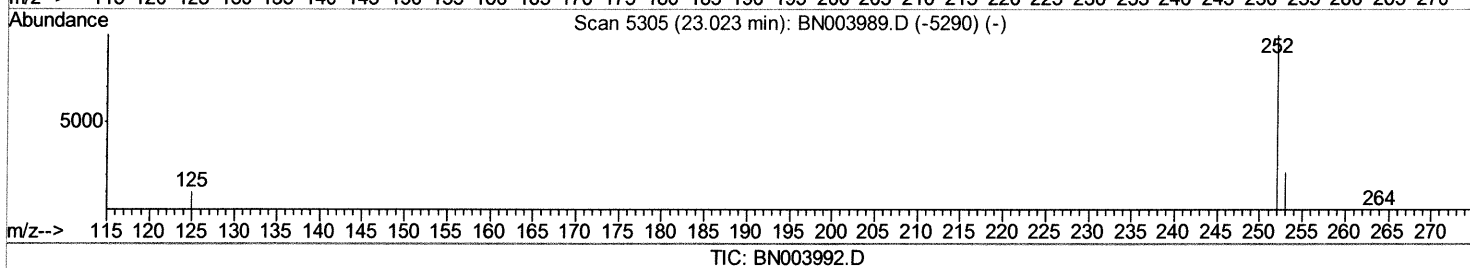
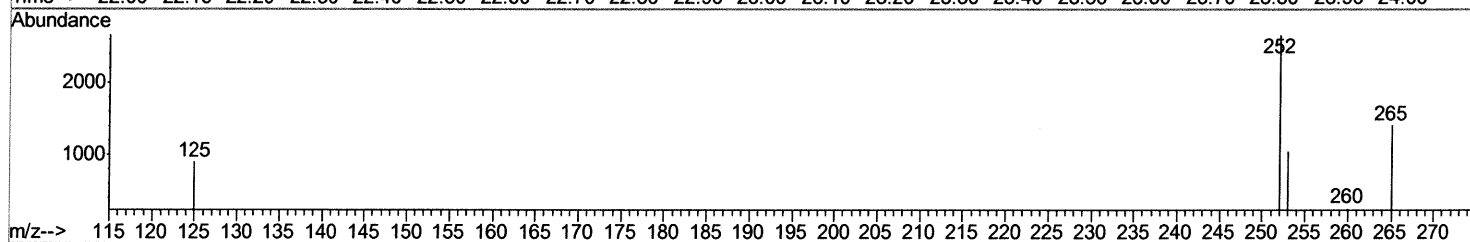
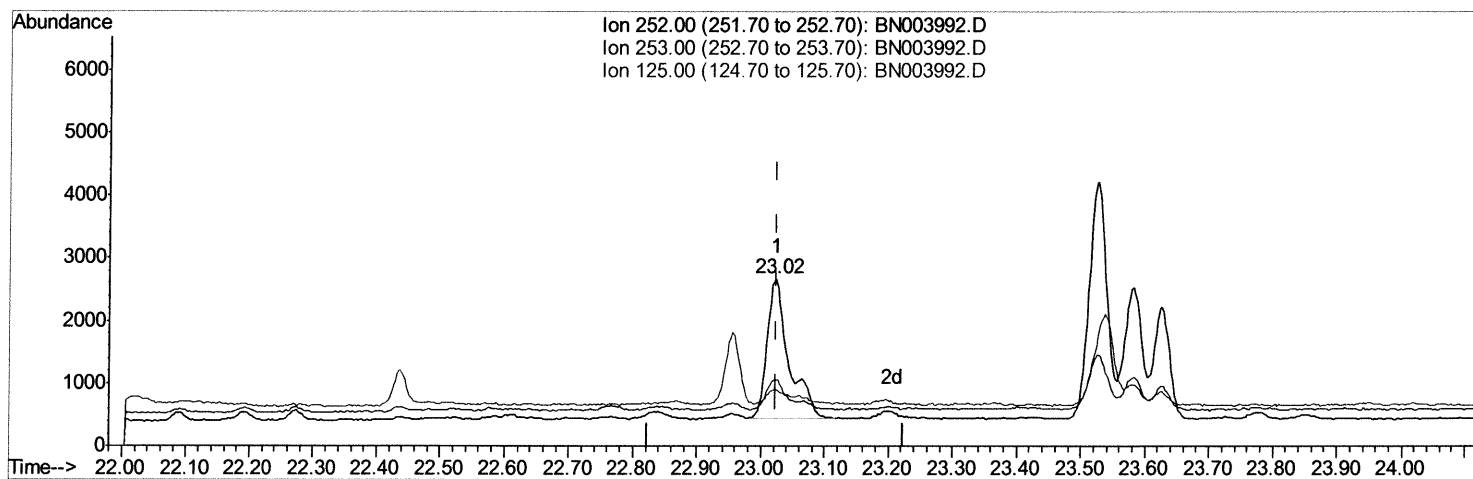
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:28:34 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(21) Benzo(b)fluoranthene
23.023min (-0.000) 0.10ng/ul
response 5280

Ion	Exp%	Act%
252.00	100	100
253.00	23.00	39.37
125.00	11.20	33.62#
0.00	0.00	0.00

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (Qedit)

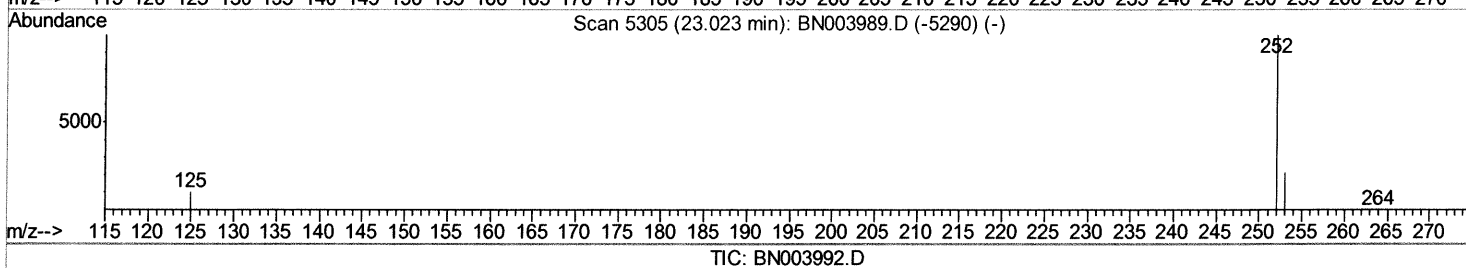
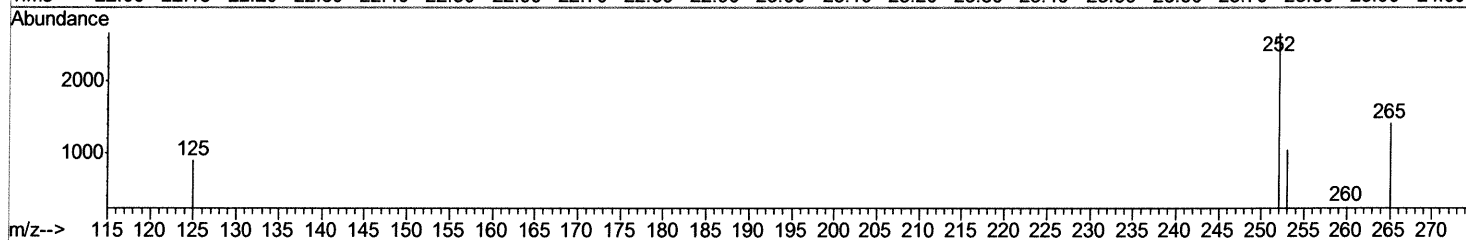
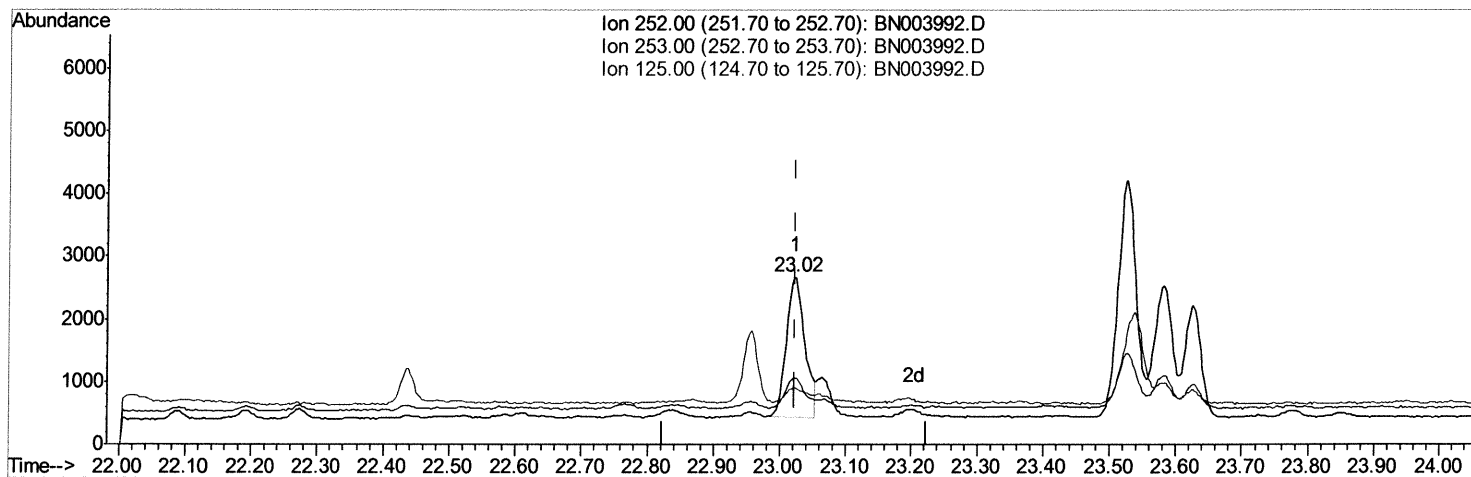
Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:28:34 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration



(21) Benzo(b)fluoranthene

23.023min (-0.000) 0.08ng/ul m

response 4385

Ion	Exp%	Act%
252.00	100	100
253.00	23.00	39.37
125.00	11.20	33.62#
0.00	0.00	0.00

> 53
12/17/18

Data Path : Z:\SVOASRV\HPCHEM1\BNA_N\DATA\BN121618\
Quantitation Report (QT Reviewed)

Data File : BN003992.D
Acq On : 16 Dec 2018 13:25
Operator : JU/SJ
Sample : J6229-15
Misc :
ALS Vial : 5 Sample Multiplier: 1

Instrument :
BNA_N
ClientSampleId :
F9E97

Manual Integrations
APPROVED

Sohil
12/17/2018 4:27:35 PM

Quant Time: Dec 17 04:29:56 2018
Quant Method : Z:\SVOASRV\HPCHEM1\BNA_N\METHODS\SOM-EPA-SIM-BN111918.M
Quant Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
QLast Update : Mon Dec 17 04:06:53 2018
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.84	152	1901	0.40	ng/ul	0.00
2) Naphthalene-d8	10.63	136	9158	0.40	ng/ul	0.00
6) Acenaphthene-d10	14.47	164	5598	0.40	ng/ul	0.00
10) Phenanthrene-d10	17.22	188	13851m	0.40	ng/ul	0.00
16) Chrysene-d12	21.40	240	15695m	0.40	ng/ul	0.00
20) Perylene-d12	23.73	264	13284m	0.40	ng/ul	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
4) 2-Methylnaphthalene-d10	12.22	152	4952	0.35	ng/ul	0.00
14) Fluoranthene-d10	19.25	212	15184m	0.37	ng/ul	0.00

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
5) 2-Methylnaphthalene	12.29	142	395	0.022	ng/ul	99
12) Phenanthrene	17.26	178	6721	0.148	ng/ul	97
15) Fluoranthene	19.28	202	2444m	0.046	ng/ul	
17) Pyrene	19.64	202	6438m	0.114	ng/ul	
18) Benzo(a)anthracene	21.39	228	3503m	0.071	ng/ul	
19) Chrysene	21.44	228	11703m	0.206	ng/ul	
21) Benzo(b)fluoranthene	23.02	252	4385m	0.080	ng/ul	
23) Benzo(a)pyrene	23.63	252	2992	0.063	ng/ul#	51
24) Indeno(1,2,3-cd)pyrene	26.09	276	2033	0.037	ng/ul#	97
26) Benzo(g,h,i)perylene	26.82	276	2654	0.056	ng/ul#	61

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

SJ
12/17/18