

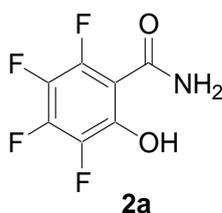
Synthesis and biological activity of polyfluorinated *p*-aminosalicylic acids and their amides

Yanina V. Burgart, Irina V. Shchur, Evgeny V. Shchegolkov and Victor I. Saloutin

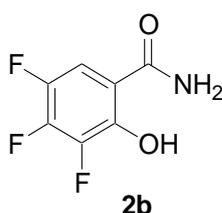
Chemistry

All solvents, chemicals, and reagents were obtained commercially and used without purification. Melting points were measured in open capillaries on a Stuart SMP30 melting point apparatus and uncorrected. The ^1H NMR spectra were registered on a Bruker Avance^{III} 500 or on a Bruker DRX-400 spectrometer (500 or 400 MHz) relative to SiMe_4 . The ^{19}F NMR spectra were obtained on a Bruker Avance^{III} 500 or on a Bruker DRX-400 spectrometer (470 or 376 MHz respectively) using C_6F_6 (δ -162.9 ppm) as an internal standard. The chemical shifts were converted from C_6F_6 to CCl_3F . The microanalyses (C, H, N) were carried out on a Perkin Elmer PE 2400 series II elemental analyzer.

2,3,4,5-Tetrafluoro- (**3a**) [S1] and 3,4,5-trifluoro-6-hydroxybenzoic (**3b**) [S1] acids and their methyl esters **1a,b** [S2] were obtained as reported.

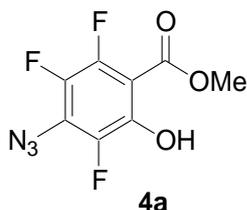


2,3,4,5-Tetrafluoro-6-hydroxybenzamide (2a). A mixture of ester **1a** (0.45 g, 2 mmol) and 25% NH_4OH (aq., 0.35 g, 10 mmol) in MeOH (10 ml) was refluxed for 8 h. The mixture was cooled and quenched with 10% HCl (10 ml). The precipitate was filtered, washed with hexane and dried to give product **2a** (0.36 g, 85%) as a white powder, mp 186–187 °C. ^1H NMR ($\text{DMSO}-d_6$, 500 MHz): δ 8.03, 8.24 (both s, 2H, NH_2); 13.37 (s, 1H, OH). ^{19}F NMR ($\text{DMSO}-d_6$, 470 MHz): δ -171.85 (ddd, 1F, F_{Ar} , J 25.2, 22.6, 5.3 Hz); -162.66 (ddd, 1F, F_{Ar} , J 22.1, 9.0, 5.3 Hz); -155.14 (td, 1F, F_{Ar} , J 22.1, 3.1 Hz); -142.27 (dd, 1F, F_{Ar} , J 25.2, 9.0 Hz). Anal. calcd. for $\text{C}_7\text{H}_3\text{F}_4\text{NO}_2$ C, 40.21; H, 1.45; N, 6.70; F, 36.34. Found: C, 39.99; H, 1.42; N, 6.55; F, 36.19.

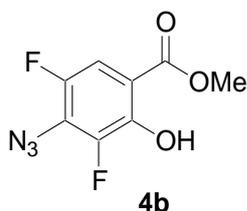


3,4,5-Trifluoro-2-hydroxybenzamide (2b) was obtained from ester **1b** (0.41 g, 2 mmol) similarly to compound **2a**. Yield 0.31 g (82%), white powder, mp 184–185 °C. ^1H NMR ($\text{DMSO}-d_6$, 500 MHz): δ 7.86–7.90 (m, 1H, H_{Ar}); 8.31, 8.55 (both s, 2H, NH_2); 13.71 (s, 1H, OH). ^{19}F NMR ($\text{DMSO}-d_6$, 470 MHz): δ -157.91 (dd, 1F, $F(3)_{\text{Ar}}$, J 20.2, 1.2 Hz); -152.95 (ddd, 1F, $F(4)_{\text{Ar}}$, J 23.0, 20.2,

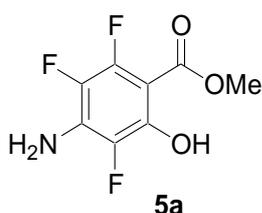
8.5 Hz); -148.47 (dd, 1F, F(5)_{Ar}, J 23.0, 11.2 Hz). Anal. calcd. for C₇H₄F₃NO₂ C, 43.99; H, 2.11; N, 7.33; F, 29.82. Found: C, 43.91; H, 2.02; N, 7.27; F, 29.97.



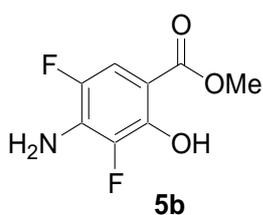
Methyl 4-azido-2,3,5-trifluoro-6-hydroxybenzoate (4a). A mixture of NaN₃ (0.98 g, 15 mmol) and ester **1a** (1.12 g, 5 mmol) of in acetone (30 ml) and water (6 ml) was refluxed for 16 h. The mixture was cooled and then poured into water (50 ml). The precipitate was filtered, washed with water, and dried to give 0.86 g (70%) of **4a**. Recrystallization from *n*-hexane gave an analytical sample of **4a** as yellow-grey powder, mp 93-94 °C. ¹H NMR (CDCl₃, 500 MHz): δ 4.02 (s, 3H, OMe); 11.18 (s, 1H, OH). ¹⁹F NMR (CDCl₃, 470 MHz): δ -160.69 (dd, 1F, F(2)_{Ar}, J 21.3, 2.8 Hz); -153.01 (dd, 1F, F(5)_{Ar}, J 12.0, 2.8 Hz); -136.95 (dd, 1F, F(3)_{Ar}, J 21.3, 12.0 Hz). Anal. calcd. for C₈H₄F₃N₃O₃ C, 38.88; H, 1.63; N, 17.00; F, 23.06. Found: C, 38.93; H, 1.71; N, 17.13; F, 23.12.



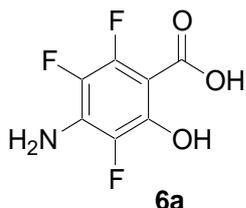
Methyl 4-azido-3,5-difluoro-2-hydroxybenzoate (4b). A mixture of NaN₃ (0.98 g, 15 mmol) of and ester **1b** (1.03 g, 5 mmol) of in acetone (10 ml) and water (3 ml) was refluxed for 40 h. The mixture was cooled and then poured into water (15 ml). The precipitate was filtered, washed with water, and dried to give 0.82 g (72%) of **4b**. Recrystallization from Et₂O gave an analytical sample of **4b** as off-white powder, mp 97-98 °C. ¹H NMR (CDCl₃, 500 MHz): δ 3.97 (s, 3H, OMe); 7.37 (dd, 1H, H_{Ar}, J 10.9, 2.3 Hz); 11.18 (s, 1H, OH). ¹⁹F NMR (CDCl₃, 470 MHz): δ -145.72 (dd, 1F, F(3)_{Ar}, J 2.3, 1.1 Hz); -135.65 (dd, 1F, F(5)_{Ar}, J 10.9, 1.1 Hz). Anal. calcd. for C₈H₅F₂N₃O₃ C, 41.93; H, 2.20; N, 18.34; F, 16.58. Found: C, 41.80; H, 2.29; N, 18.14; F, 16.54.



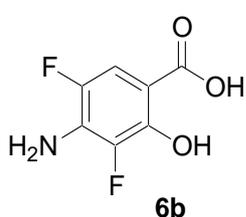
Methyl 4-amino-2,3,5-trifluoro-6-hydroxybenzoate (5a). A mixture of azido ester **4a** (0.74 g, 3 mmol), zinc dust (0.26 g, 4 mmol) and NH₄Cl (0.37 g, 7 mmol) in methanol (30 ml) and water (6 ml) was refluxed for 4 h. The mixture was cooled and then added to 10% NH₄OH (5 ml). The resulting solution was extracted with methyl acetate (30 ml) and chloroform (30 ml). The solvent was removed *in vacuo*, the crude product was washed with hot hexane to give 0.56 g (85%) of **5a** as pink-brown powder, mp 180-181 °C. ¹H NMR (DMSO-*d*₆, 500 MHz): δ 3.86 (s, 3H, OMe); 6.63 (s, 2H, NH₂); 10.90 (s, 1H, OH). ¹⁹F NMR (DMSO-*d*₆, 470 MHz): δ -168.70 (dd, 1F, F(2)_{Ar}, J 22.8, 6.1 Hz); -162.67 (dd, 1F, F(5)_{Ar}, J 9.2, 6.1 Hz); -141.00 (dd, 1F, F(3)_{Ar}, J 22.8, 9.2 Hz). Anal. calcd. for C₈H₆F₃NO₃ C, 43.45; H, 2.73; N, 6.33; F, 25.77. Found: C, 43.23; H, 2.80; N, 6.21; F, 25.62.



Methyl 4-amino-3,5-difluoro-2-hydroxybenzoate (5b) was obtained from azido ester **4b** (0.69 g, 3 mmol) similarly to compound **5a**. Yield 0.53 g (87%), beige powder, mp 147-148 °C. ¹H NMR (CDCl₃, 400 MHz): δ 3.91 (s, 3H, OMe); 4.27 (s, 2H, NH₂); 7.27 (dd, 1H, H_{Ar}, *J* 10.8, 1.9 Hz); 10.76 (s, 1H, OH). ¹⁹F NMR (CDCl₃, 376 MHz): δ -158.99 (dd, 1F, F(3)_{Ar}, *J* 7.8, 1.9 Hz); -145.07 (dd, 1F, F(5)_{Ar}, *J* 10.8, 7.8 Hz). Anal. calcd. for C₈H₇F₂NO₃ C, 47.30; H, 3.47; N, 6.90; F, 18.70. Found: C, 47.23; H, 3.37; N, 6.83; F, 18.64.



4-Amino-2,3,5-trifluoro-6-hydroxybenzoic acid (6a). A mixture of amino ester **5a** (0.44 g, 2 mmol), morpholine (0.52 g, 6 mmol) and DIPEA (0.26 g, 2 mmol) of in MeCN (10 ml) was refluxed for 8 h. The mixture was cooled and quenched with 10% HCl (15 ml). The precipitate was filtered, washed with hot hexane and chloroform, and dried to give 0.27 g (65%) of **6a** as pale-brown powder, mp 200 °C (subl.). ¹H NMR (DMSO-*d*₆, 400 MHz): δ 6.58 (s, 2H, NH₂); 2 OH were not observed due to deuterium exchange with solvent. ¹⁹F NMR (DMSO-*d*₆, 376 MHz): δ -169.43 (dm, 1F, F(2)_{Ar}, *J* 23.8 Hz); -163.96 (dd, 1F, F(5)_{Ar}, *J* 9.5, 5.6 Hz); -140.59 (dm, 1F, F(3)_{Ar}, *J* 23.8 Hz). Anal. calcd. for C₇H₄F₃NO₃ C, 40.60; H, 1.95; N, 6.76; F, 27.52. Found: C, 40.68; H, 2.03; N, 6.97; F, 27.62.

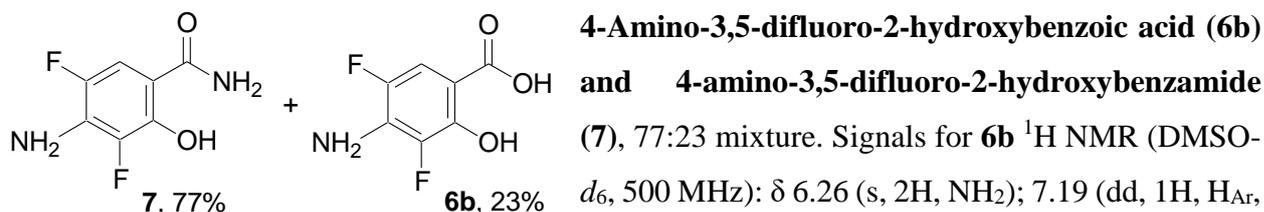


4-Amino-3,5-difluoro-2-hydroxybenzoic acid (6b) was obtained from amino ester **5b** (0.41 g, 2 mmol) similarly to compound **6a**. Yield 0.25 g (67%), beige powder, mp 220 °C subl. ¹H NMR (DMSO-*d*₆, 500 MHz): δ 6.25 (s, 2H, NH₂); 7.19 (dd, 1H, H_{Ar}, *J* 11.4, 1.8 Hz); 11.35, 13.61 (both br. s, 2 H, 2 OH). ¹⁹F NMR (DMSO-*d*₆, 470 MHz): δ -158.16 (dd, 1F, F(3)_{Ar}, *J* 9.7, 1.8 Hz); -142.49 (dd, 1F, F(5)_{Ar}, *J* 11.4, 9.7 Hz). Anal. calcd. for C₇H₅F₂NO₃ C, 44.46; H, 2.67; N, 7.41; F, 20.09. Found: C, 44.41; H, 2.78; N, 7.37; F, 19.84.



3-Amino-2,4-difluorophenol (8). A mixture of amino ester **4b** (0.20 g, 1 mmol), 25% NH₄OH (aq., 0.17 g, 5 mmol) and MeOH (7 ml) was refluxed for 8 h. Then, 10% HCl (7 ml) was added, and the mixture was heated at 60-80 °C for 1 h. After cooling, the precipitate was filtered, washed with hexane and dried to give 98 mg (68%) of **8** as white powder, mp 140-141 °C. ¹H NMR (DMSO-*d*₆, 400 MHz): δ 5.02 (s, 2H, NH₂); 6.07 (td, 1H, H(6)_{Ar}, *J* 9.1, 5.1 Hz); 6.64 (ddd, 1H, H(5)_{Ar}, *J* 10.9, 9.1, 2.1 Hz); 9.31 (s, 1H, OH). ¹⁹F NMR (DMSO-*d*₆, 376 MHz): δ -154.22...-154.17 (m, 1F, F(2)_{Ar}); -143.45

(ddd, 1F, F(4)_{Ar}, *J* 10.9, 7.8, 5.1 Hz). Anal. calcd. for C₆H₅F₂NO C, 49.66; H, 3.47; N, 9.65; F, 26.19. Found: C, 49.75; H, 3.35; N, 9.73; F, 26.39.

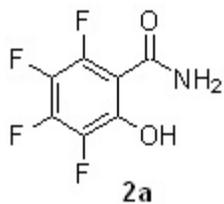


Biological tests

Experiments in the study of anti-inflammatory activity and acute toxicity [S2] and tuberculostatic activity [S1] were performed according to the methods described by us earlier.

References

- [S1] E. V. Shchegol'kov, I. V. Shchur, Y. V. Burgart, V. I. Saloutin, S. Y. Solodnikov, O. P. Krasnykh and M. A. Kravchenko, *Bioorg. Med. Chem. Lett.*, 2016, **26**, 2455–2458.
- [S2] E. V. Shchegol'kov, I. V. Shchur, Y. V. Burgart, V. I. Saloutin, A. N. Trefilova, G. A. Ljushina, S. Y. Solodnikov, L. N. Markova, V. V. Maslova, O. P. Krasnykh, S. S. Borisevich and S. L. Khursan, *Bioorg. Med. Chem.*, 2017, **25**, 91–99.



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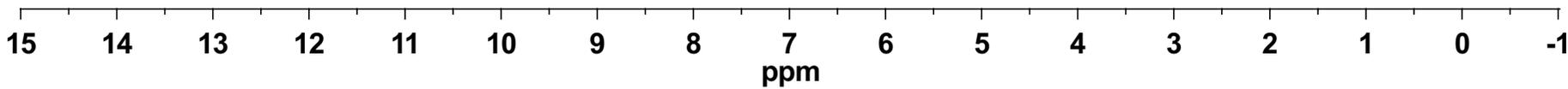
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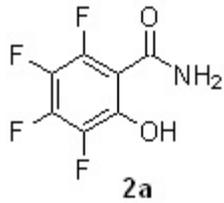
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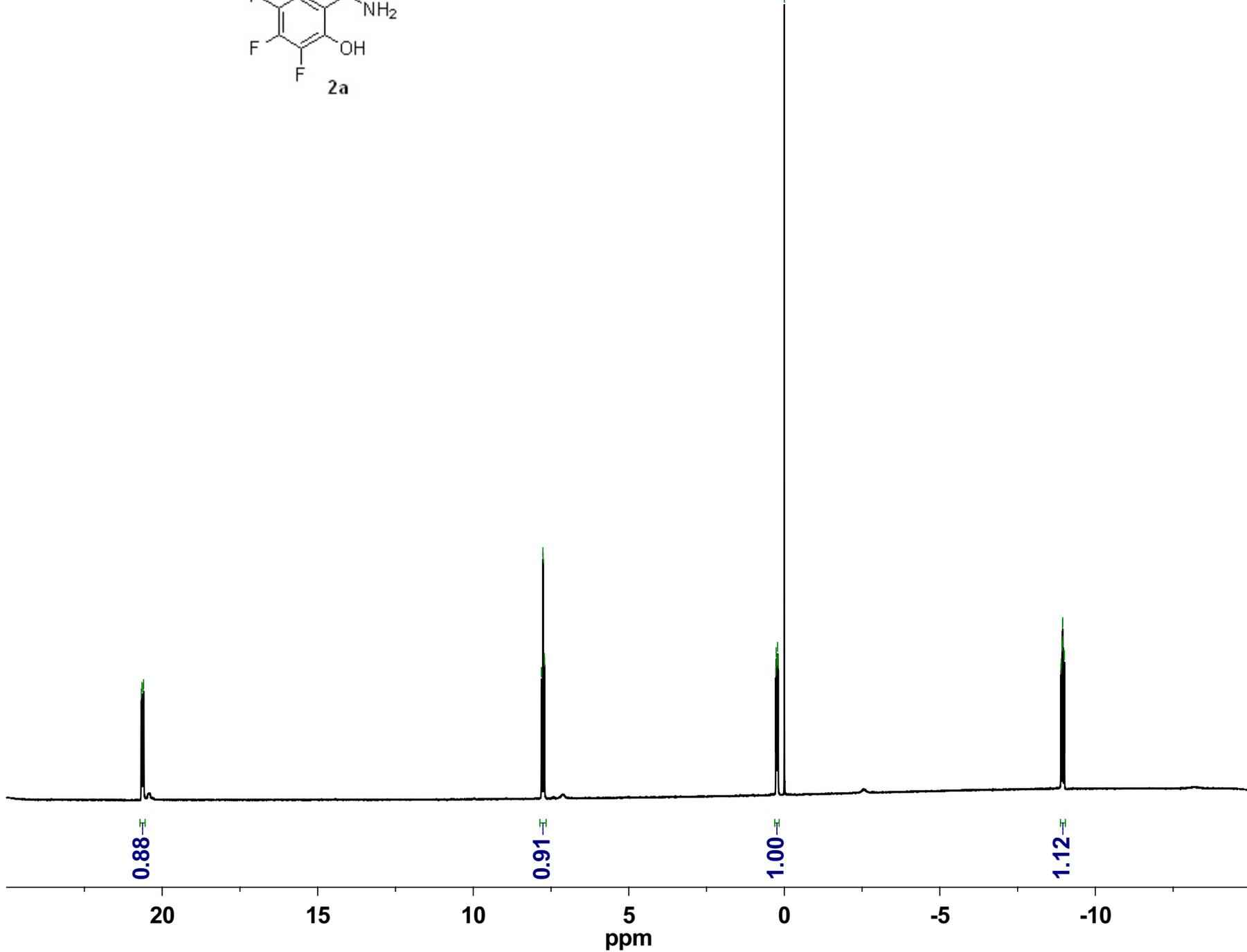
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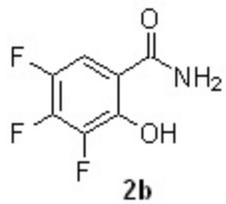
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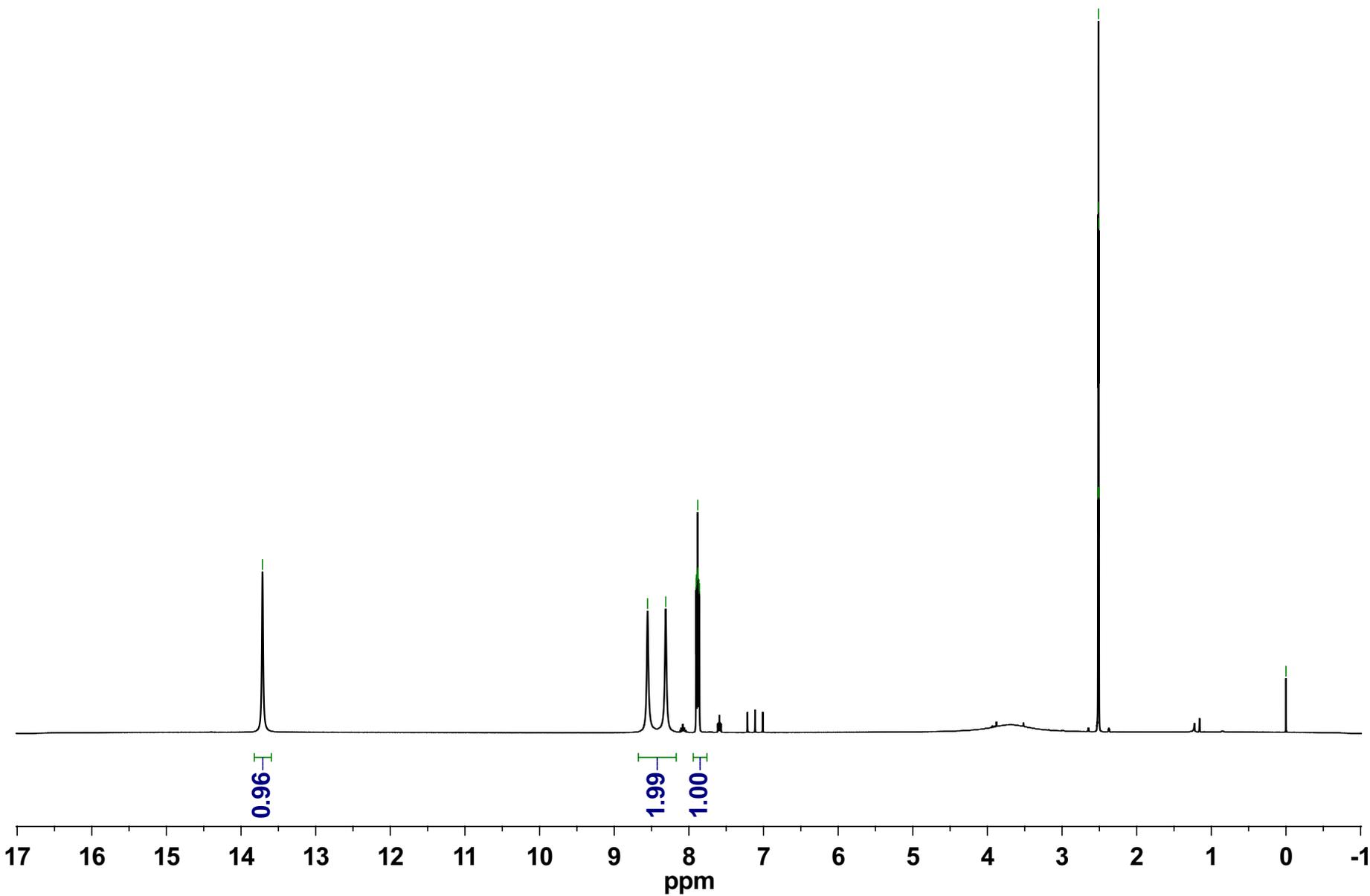


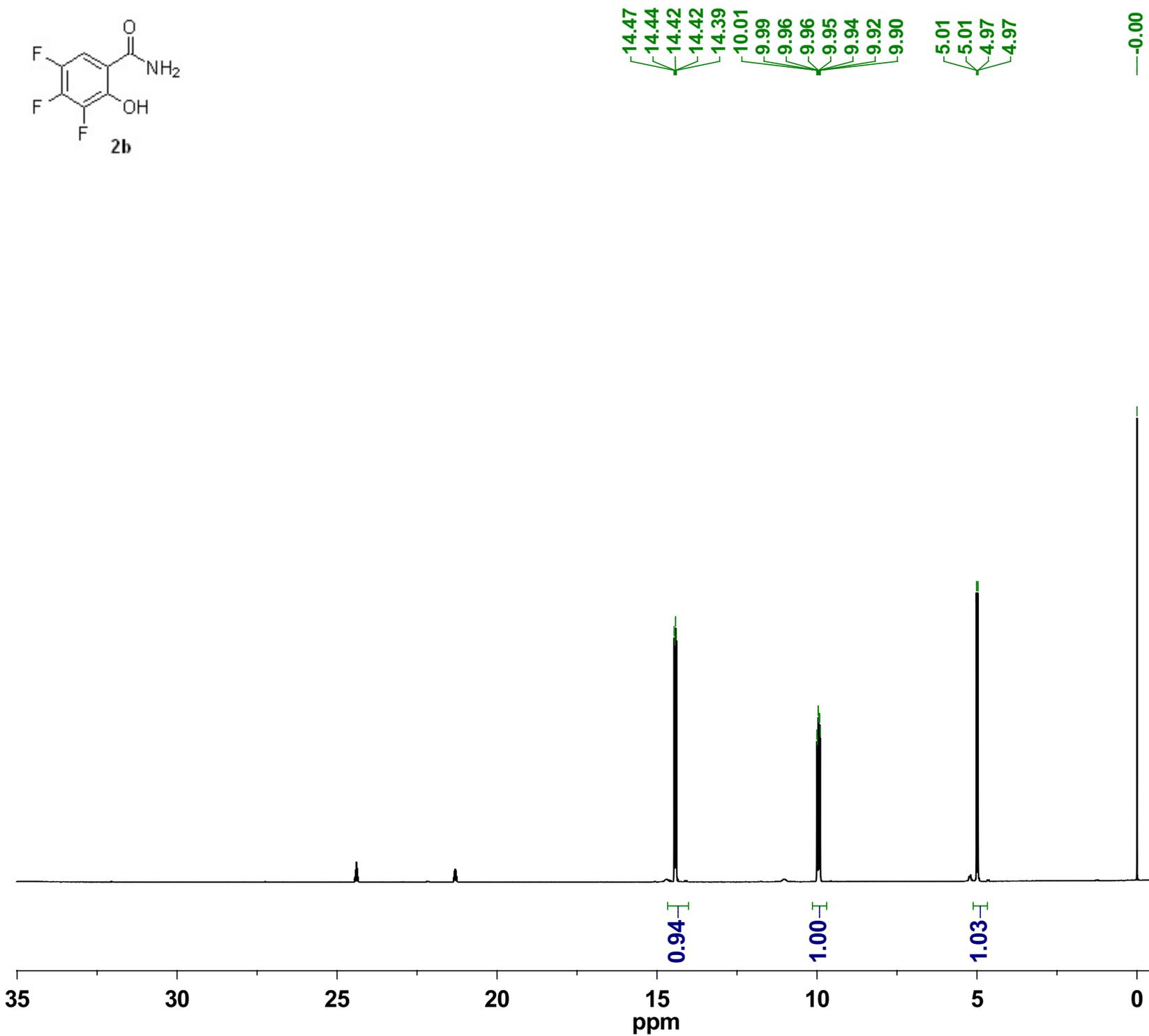
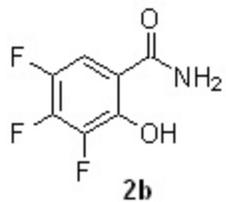
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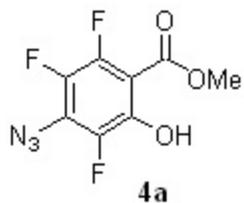
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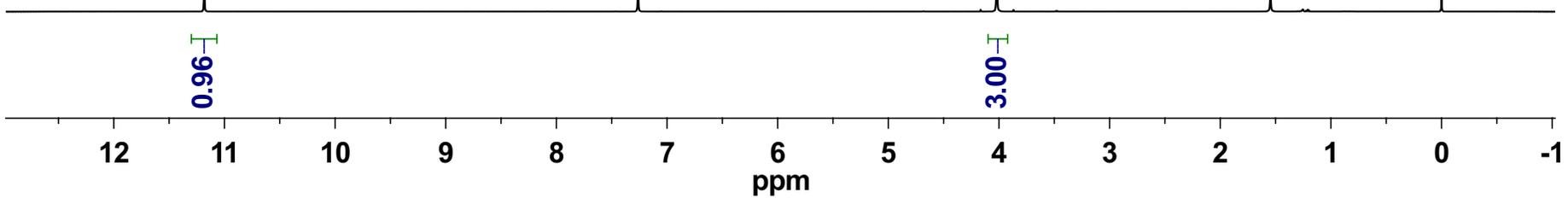
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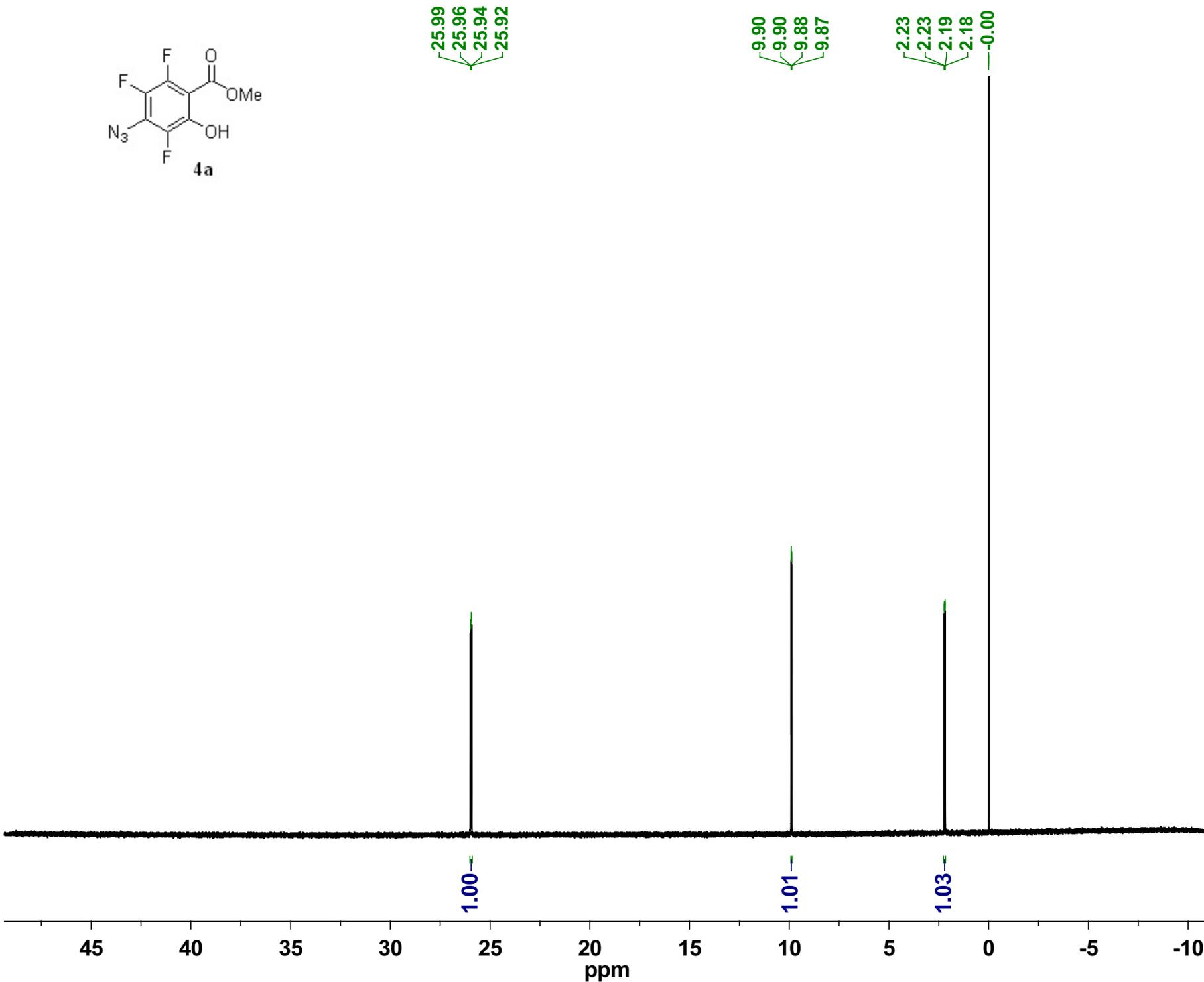
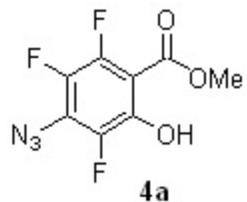
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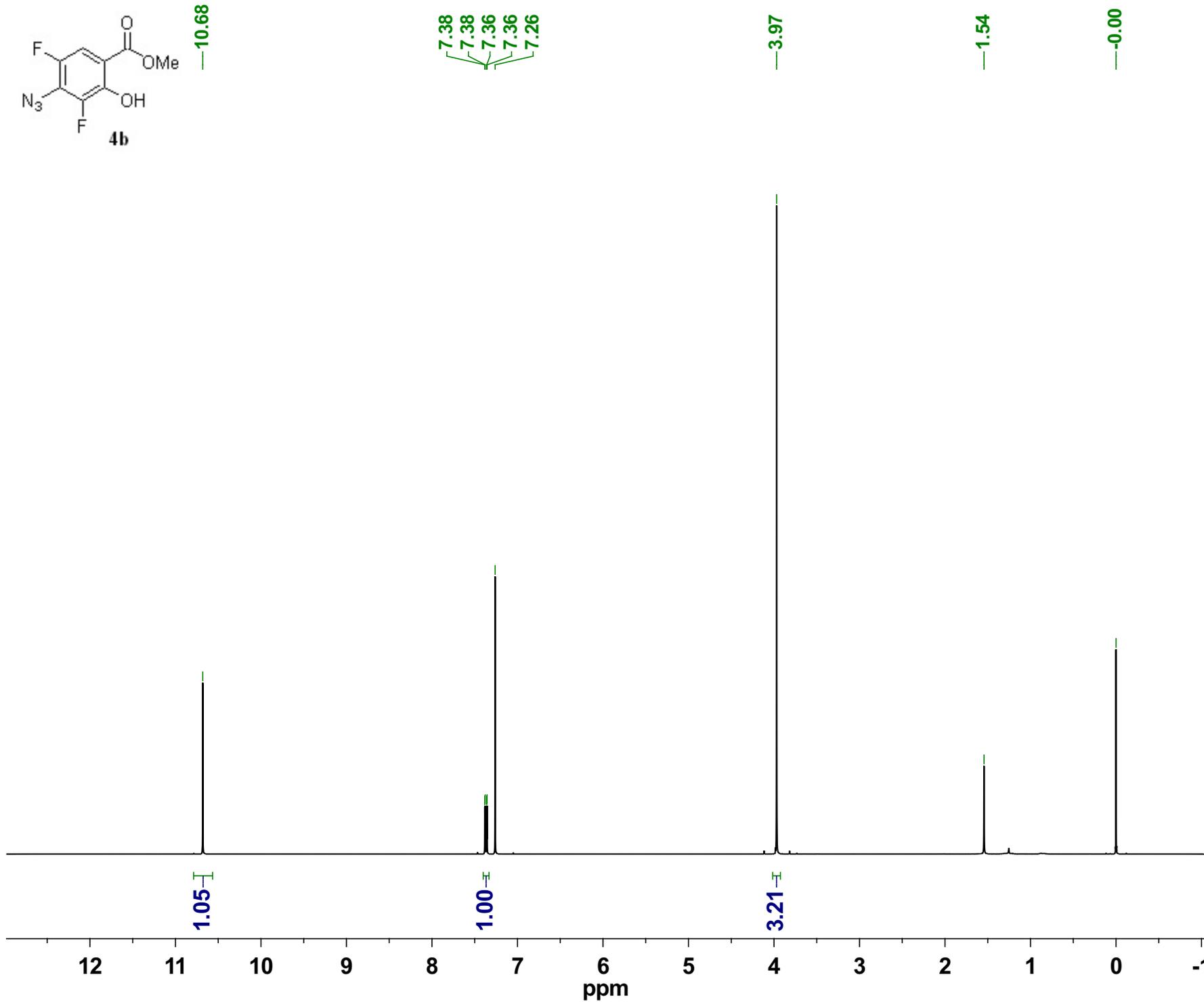
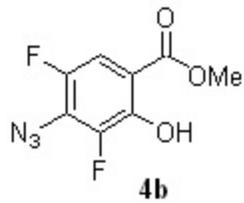
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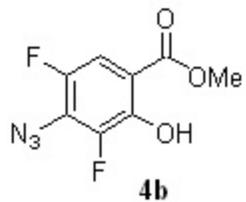
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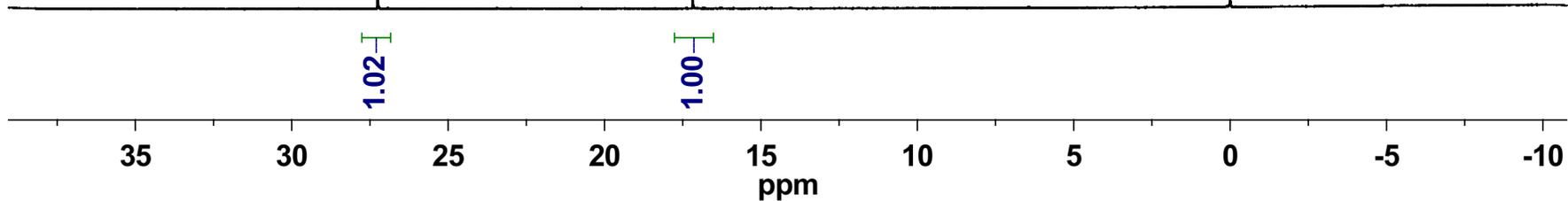
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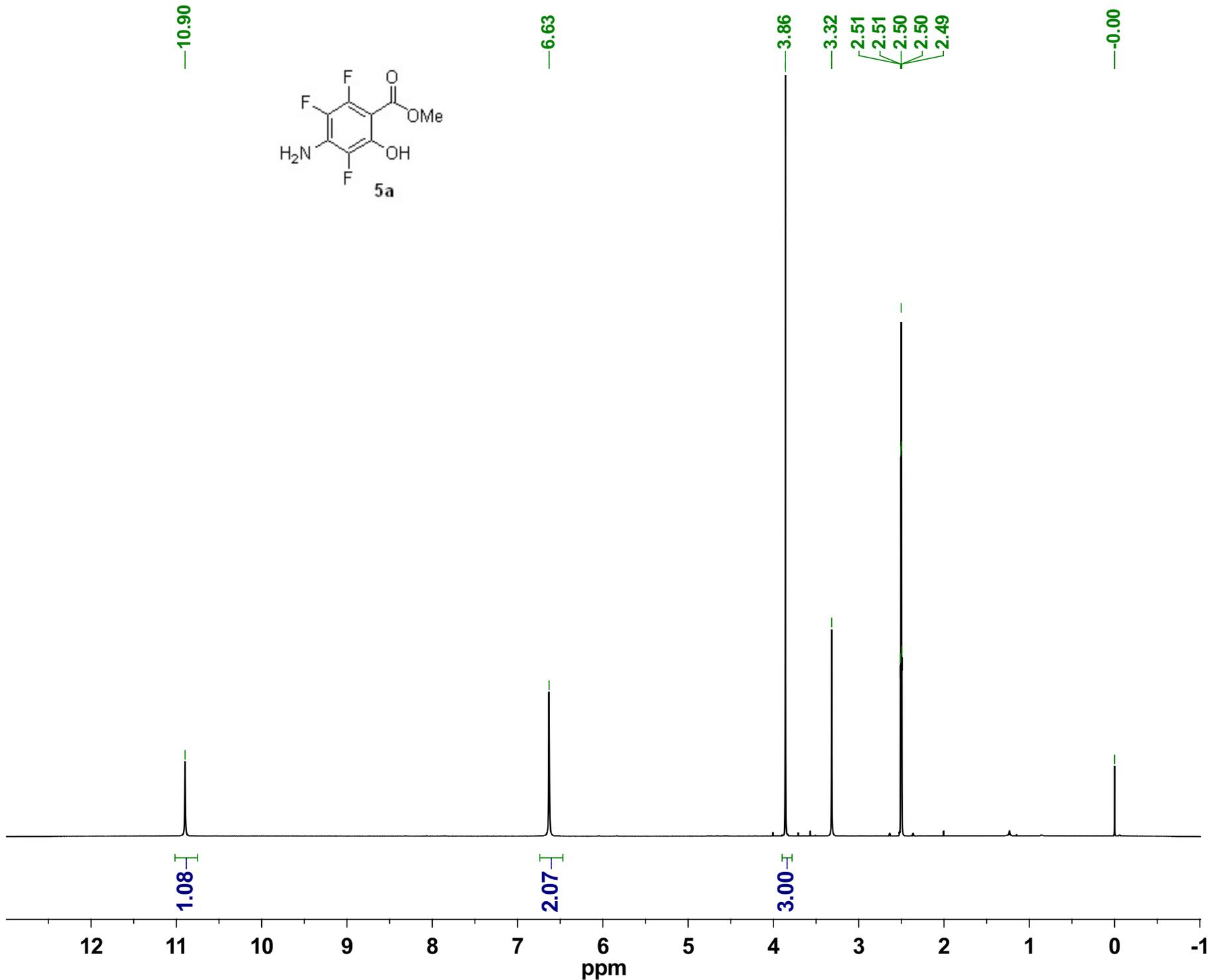
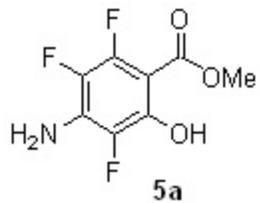
17.19
17.18
17.18
17.18

0.00



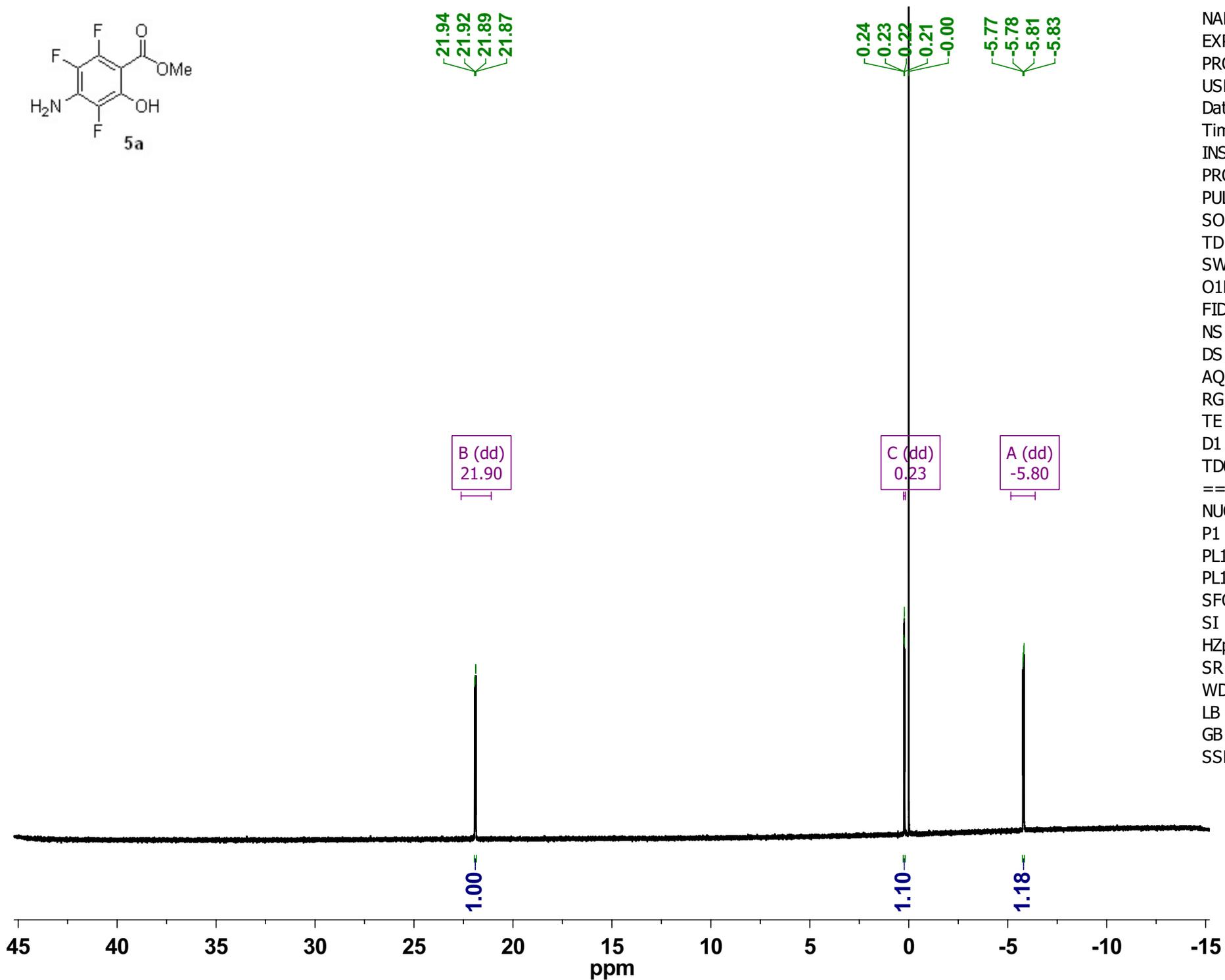
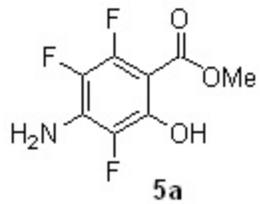
```

NAME      IVS104d1
EXPNO     19
PROCNO    1
USER      uralnmr
Date_     20141031
Time      14.03
INSTRUM   AV500
PROBHD    5 mm PABBO BB-
PULPROG   zgflqn
SOLVENT   CDCl3
TD         131072
SW         49.8116 ppm
O1P        15.000 ppm
FIDRES     0.178814 Hz
NS         16
DS         2
AQ         2.7962527 sec
RG         203
TE         296.4 K
D1         1.00000000 sec
TD0        1
===== CHANNEL f1 =====
NUC1       19F
P1         6.00 usec
PL1        -5.00 dB
PL1W       46.07103729 W
SFO1       470.5229377 MHz
ND0        2
TD         256
SFO1       125.7667 MHz
FIDRES     77.746742 Hz
SW         158.255 ppm
FnMODE     States-TPPI
SI         131072
HZpPT     0.178814 Hz
SR         401.28 Hz
WDW        EM
LB         0.00 Hz
GB         0
SSB        0
  
```



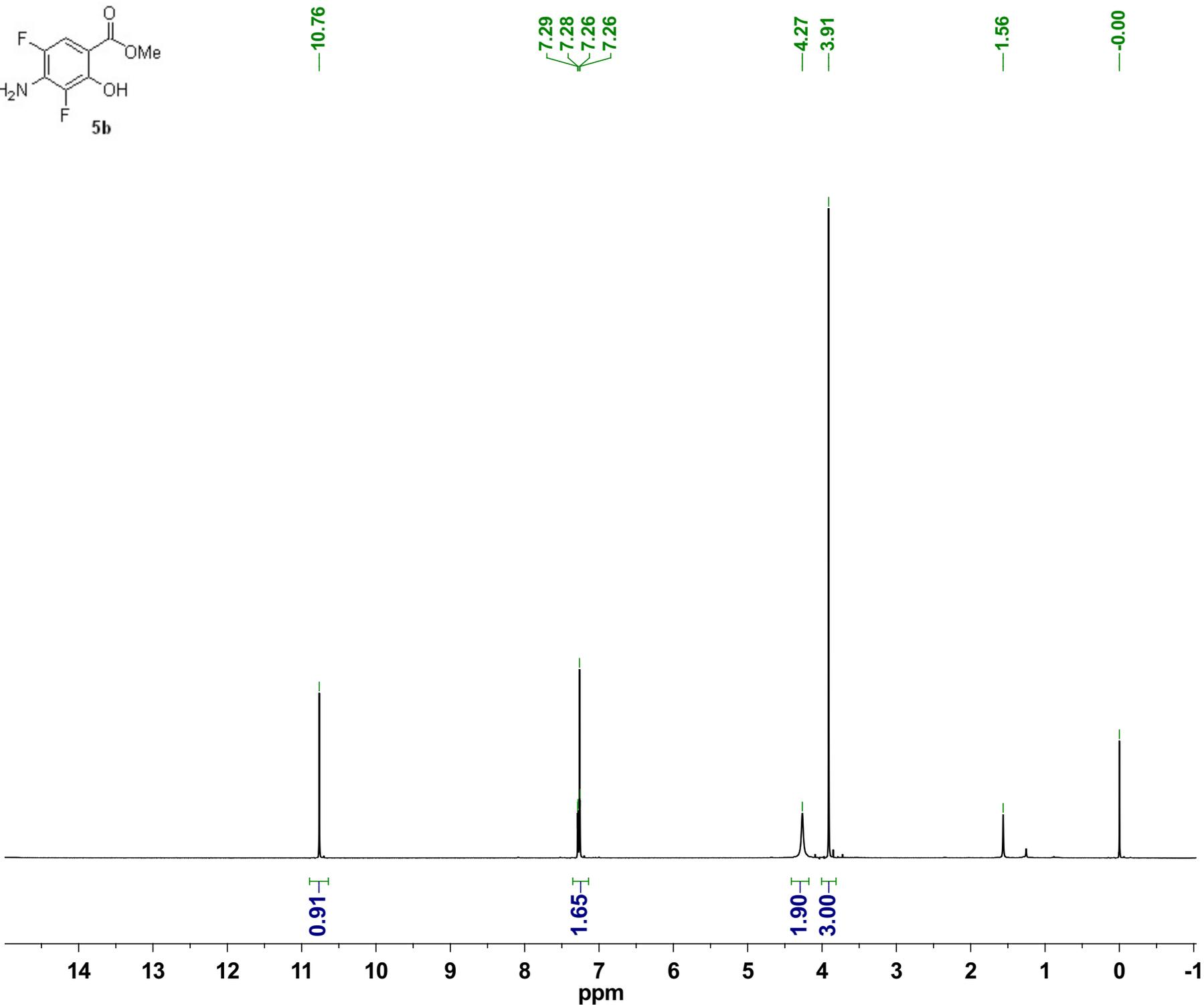
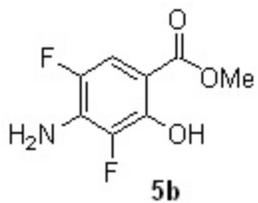
```

NAME      IVS135
EXPNO     1
PROCNO    1
USER      uralnmr
Date_     20150130
Time      15.57
INSTRUM   AV500
PROBHD    5 mm PABBO BB-
PULPROG   zg30
SOLVENT   DMSO
TD         32768
SW         14.0019 ppm
O1P        6.000 ppm
FIDRES     0.213709 Hz
NS         16
DS         2
AQ         2.3396852 sec
RG         203
TE         296.5 K
D1         1.00000000 sec
TD0        1
===== CHANNEL f1 =====
NUC1       1H
P1         12.00 usec
PL1        1.00 dB
PL1W       16.10176659 W
SFO1       500.1330008 MHz
SI         32768
HZpPT     0.213709 Hz
SR         4.17 Hz
WDW        EM
LB         0.00 Hz
GB         0
SSB        0
  
```



```

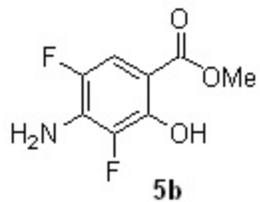
NAME      IVS135
EXPNO     19
PROCNO    1
USER      uralnmr
Date_     20150130
Time      16.04
INSTRUM   AV500
PROBHD    5 mm PABBO BB-
PULPROG   zgfgqn
SOLVENT   DMSO
TD         131072
SW         60.3777 ppm
O1P       15.000 ppm
FIDRES    0.216744 Hz
NS         16
DS         2
AQ         2.3069172 sec
RG         203
TE         296.6 K
D1         1.00000000 sec
TD0        1
==== CHANNEL f1 =====
NUC1       19F
P1         6.00 usec
PL1        -5.00 dB
PL1W       46.07103729 W
SFO1       470.5229377 MHz
SI         131072
HZpPT     0.216744 Hz
SR         -4.30 Hz
WDW        EM
LB         0.00 Hz
GB         0
SSB        0
  
```



Current Data Parameters
 NAME IVS107a
 EXPNO 1
 PROCNO 1
 USER uralnmr

F2 - Acquisition Parameters
 Date_ 20150923
 Time 12.51
 INSTRUM DRX400
 PROBHD 5 mm SEF 19F-1
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 6410.256 Hz
 FIDRES 0.195625 Hz
 AQ 2.5559540 sec
 RG 574.7
 DW 78.000 usec
 DE 6.00 usec
 TE 297.2 K
 D1 1.00000000 sec
 MCREST 0.00000000 sec
 MCWRK 0.01500000 sec
 === CHANNEL f1 =====
 NUC1 1H
 P1 20.00 usec
 PL1 0.00 dB
 SFO1 400.1328009 MHz

F2 - Processing parameters
 SI 32768
 HZpPT 0.195625 Hz
 SF 400.1300085 MHz
 SR 8.51 Hz
 WDW EM
 LB 0.00 Hz
 GB 0
 SSB 0
 PC 4.00



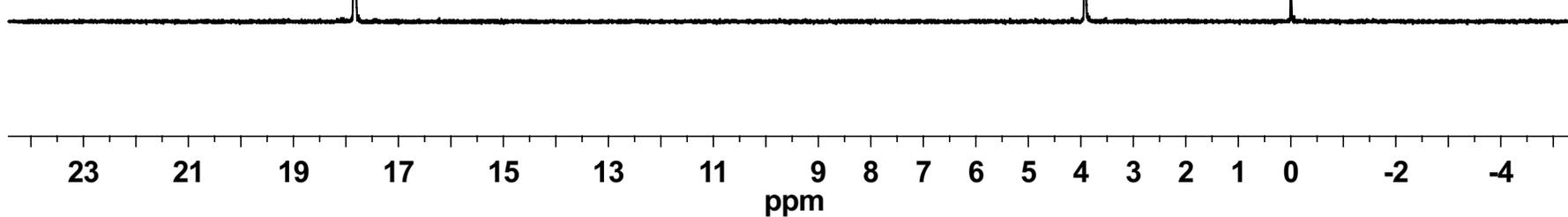
17.86
17.84
17.83
17.81

3.93
3.93
3.91
3.91

-0.00

B (dd)
17.83

A (dd)
3.92



Current Data Parameters

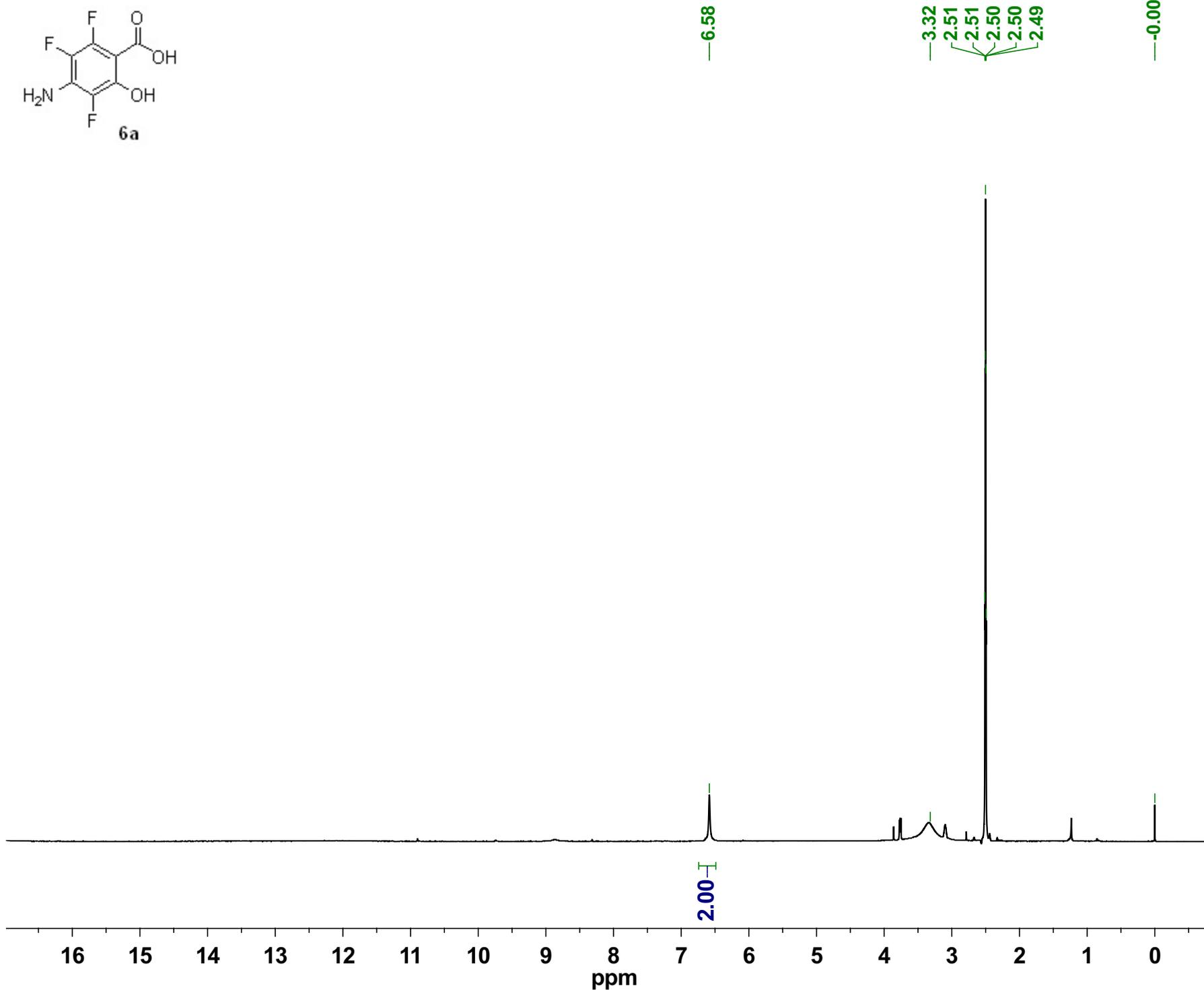
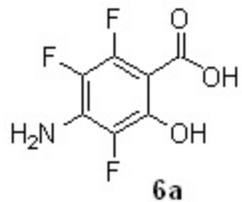
NAME IVS107a
EXPNO 19
PROCNO 1
USER uralnmr

F2 - Acquisition Parameters

Date_ 20150923
Time 12.57
INSTRUM DRX400
PROBHD 5 mm SEF 19F-1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 11261.262 Hz
FIDRES 0.171833 Hz
AQ 2.9098485 sec
RG 2580.3
DW 44.400 usec
DE 6.00 usec
TE 297.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
==== CHANNEL f1 =====
NUC1 19F
P1 10.10 usec
PL1 0.00 dB
SFO1 376.4410494 MHz

F2 - Processing parameters

SI 65536
HZpPT 0.171833 Hz
SF 376.4374849 MHz
SR 199.86 Hz
WDW EM
LB 0.00 Hz
GB 0
SSB 0
PC 2.00



Current Data Parameters

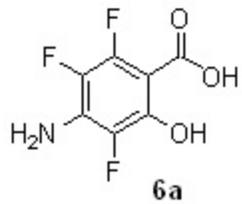
NAME IVS245b
 EXPNO 1
 PROCNO 1
 USER uralnmr

F2 - Acquisition Parameters

Date_ 20190211
 Time 10.45
 INSTRUM DRX400
 PROBHD 5 mm SEF 19F-1
 PULPROG zg30
 TD 32768
 SOLVENT DMSO
 NS 16
 DS 2
 SWH 7183.908 Hz
 FIDRES 0.219235 Hz
 AQ 2.2807028 sec
 RG 724.1
 DW 69.600 usec
 DE 6.50 usec
 TE 297.2 K
 D1 1.00000000 sec
 MCREST 0.00000000 sec
 MCWRK 0.01500000 sec
 ===== CHANNEL f1 =====
 NUC1 1H
 P1 20.00 usec
 PL1 0.00 dB
 SFO1 400.1332010 MHz

F2 - Processing parameters

SI 32768
 HZpPT 0.219235 Hz
 SF 400.1300019 MHz
 SR 1.94 Hz
 WDW EM
 LB 0.00 Hz
 GB 0
 SSB 0
 PC 4.00



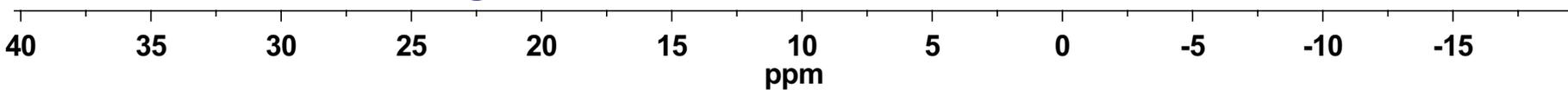
22.29

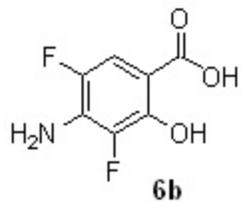
0.00
1.04
1.06
1.07
1.08
6.50
6.57

Current Data Parameters
 NAME IVS245b
 EXPNO 19
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20190208
 Time 12.10
 INSTRUM DRX400
 PROBHD 5 mm SEF 19F-1
 PULPROG zg30
 TD 131072
 SOLVENT DMSO
 NS 32
 DS 2
 SWH 22522.523 Hz
 FIDRES 0.171833 Hz
 AQ 2.9097984 sec
 RG 5792.6
 DW 22.200 usec
 DE 6.50 usec
 TE 297.2 K
 D1 1.00000000 sec
 MCREST 0 sec
 MCWRK 0.01500000 sec
 ===== CHANNEL f1 =====
 NUC1 19F
 P1 10.10 usec
 PL1 0 dB
 SFO1 376.4410494 MHz

F2 - Processing parameters
 SI 131072
 SF 376.4371609 MHz
 WDW EM
 SSB 0
 LB 0 Hz
 GB 0
 PC 3.00





13.61

11.35

7.20

7.20

7.18

7.18

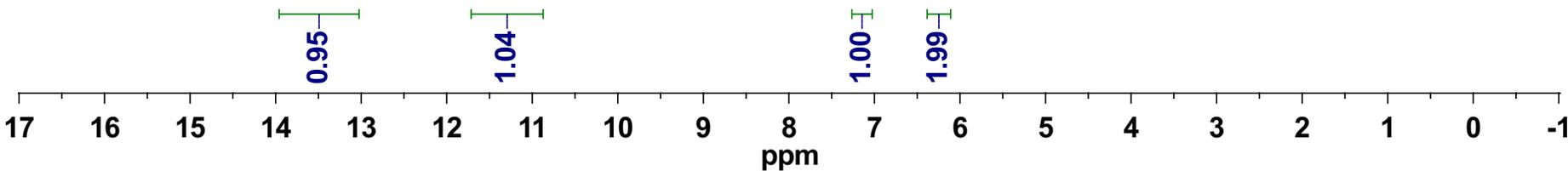
6.25

2.51

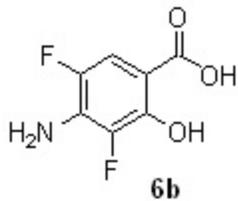
2.50

2.50

0.00



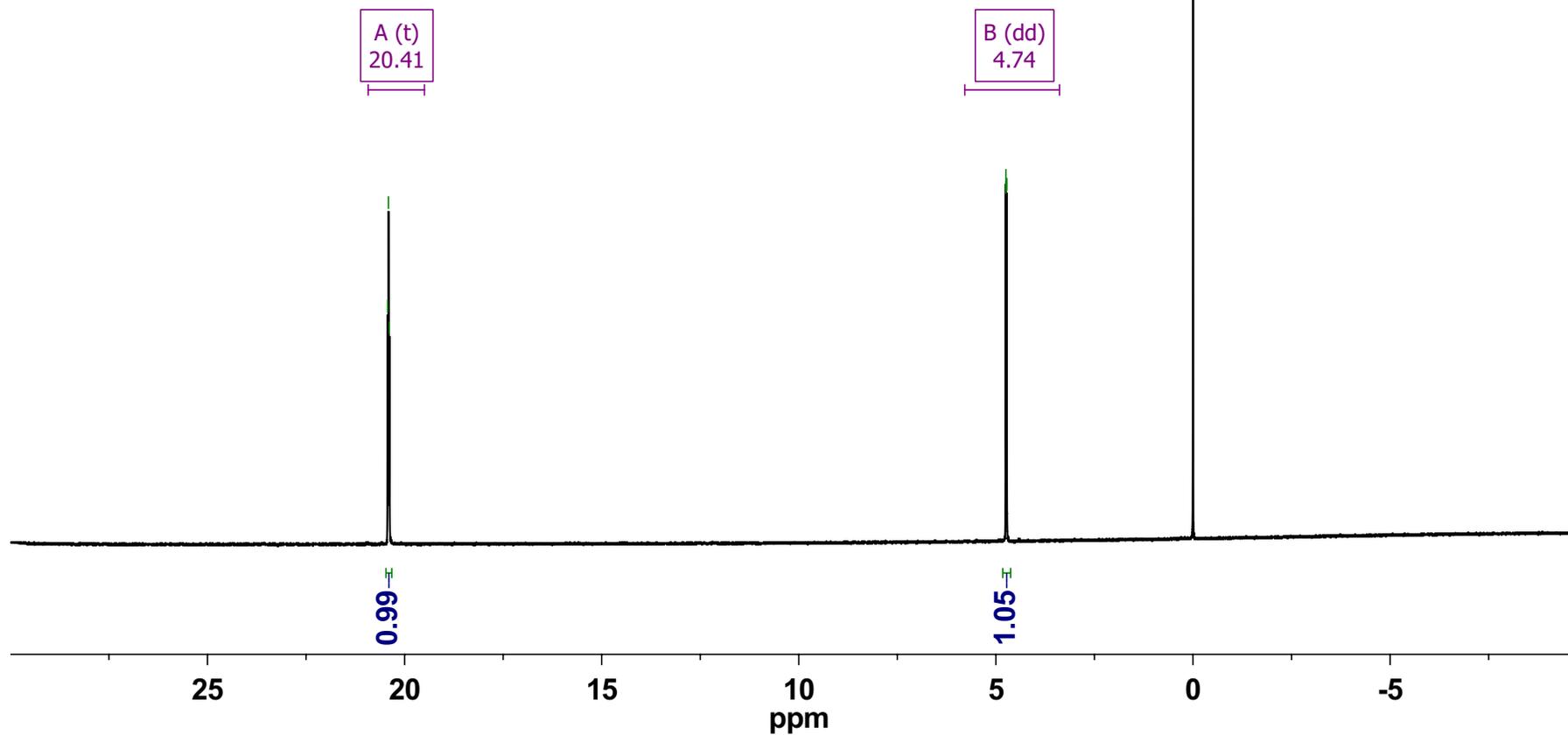
NAME	IVS124a
EXPNO	1
PROCNO	1
USER	uralnmr
Date_	20140321
Time	14.51
INSTRUM	AV500
PROBHD	5 mm PABBO BB-
PULPROG	zg30
SOLVENT	DMSO
TD	32768
SW	18.0240 ppm
O1P	8.000 ppm
FIDRES	0.275098 Hz
NS	16
DS	2
AQ	1.8175818 sec
RG	114
TE	296.7 K
D1	1.00000000 sec
TD0	1
==== CHANNEL f1 ====	
NUC1	1H
P1	12.00 usec
PL1	1.00 dB
PL1W	16.10176659 W
SFO1	500.1340010 MHz
SI	32768
HZpPT	0.275098 Hz
SR	2.74 Hz
WDW	EM
LB	0.00 Hz
GB	0
SSB	0



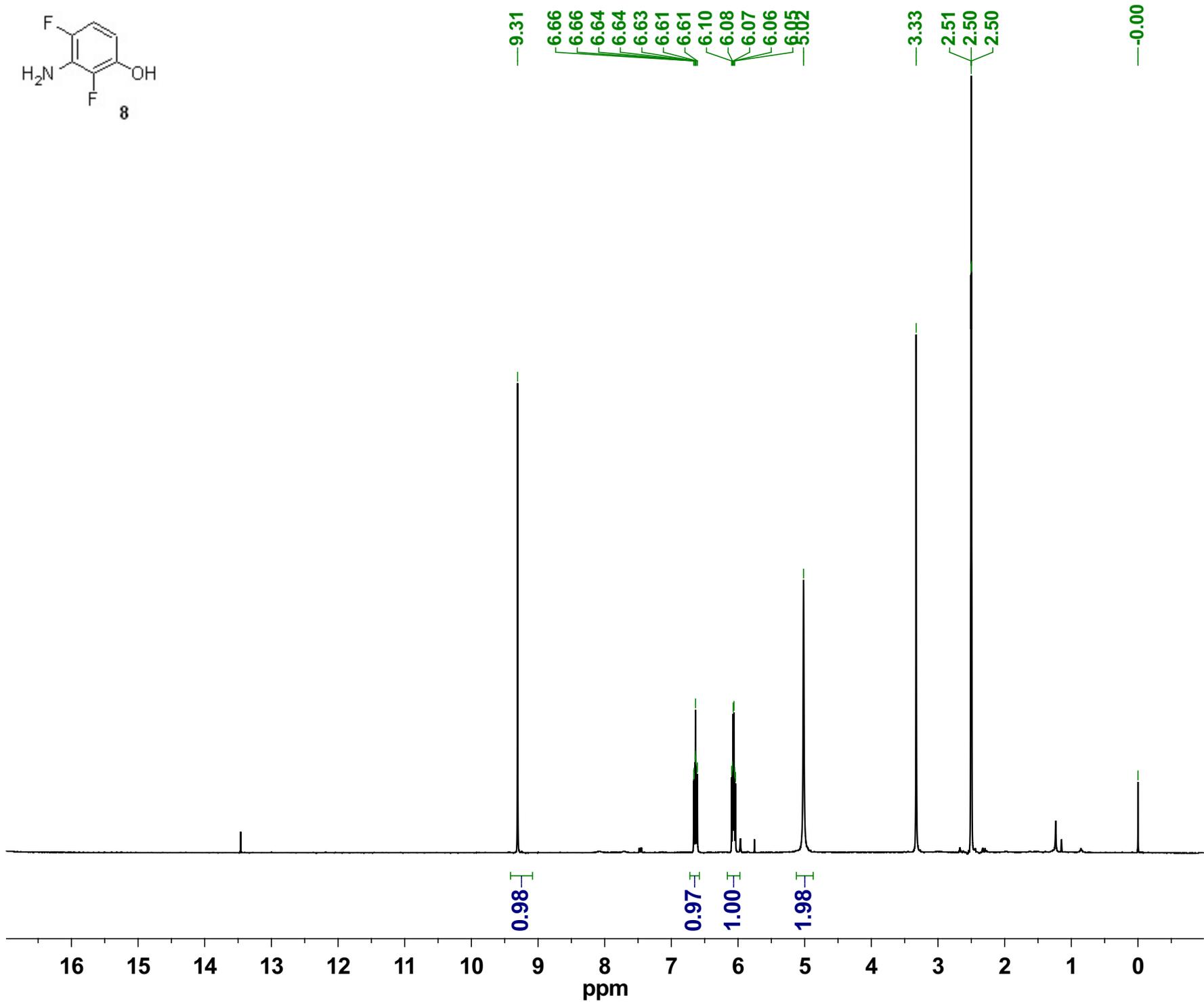
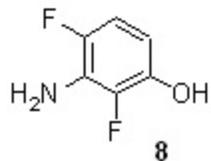
20.43
20.41
20.39

4.75
4.75
4.73
4.73

0.00



NAME	IVS124a
EXPNO	19
PROCNO	1
USER	uralnmr
Date_	20140321
Time	14.59
INSTRUM	AV500
PROBHD	5 mm PABBO BB-
PULPROG	zgflqg
SOLVENT	DMSO
TD	131072
SW	39.9494 ppm
O1P	10.000 ppm
FIDRES	0.143410 Hz
NS	16
DS	2
AQ	3.4865651 sec
RG	128
TE	296.7 K
D1	1.0000000 sec
TD0	1
==== CHANNEL f1 ====	
NUC1	19F
P1	13.90 usec
PL1	-5.00 dB
PL1W	46.07103729 W
SFO1	470.5205852 MHz
ND0	2
TD	256
SFO1	125.7667 MHz
FIDRES	77.746742 Hz
SW	158.255 ppm
FnMODE	States-TPPI
SI	131072
HZpPT	0.143410 Hz
SR	-3.40 Hz
WDW	EM
LB	0.00 Hz
GB	0
SSB	0



Current Data Parameters

NAME	IVS148a
EXPNO	1
PROCNO	1
USER	uralnmr

F2 - Acquisition Parameters

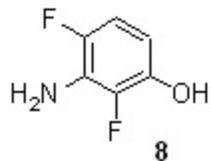
Date_	20160208
Time	13.13
INSTRUM	DRX400
PROBHD	5 mm SEF 19F-1
PULPROG	zg30
TD	32768
SOLVENT	DMSO
NS	16
DS	2
SWH	7183.908 Hz
FIDRES	0.219235 Hz
AQ	2.2807028 sec
RG	574.7
DW	69.600 usec
DE	6.00 usec
TE	297.2 K
D1	1.50000000 sec
MCREST	0.00000000 sec
MCWRK	0.01500000 sec

==== CHANNEL f1 =====

NUC1	1H
P1	20.00 usec
PL1	0.00 dB
SFO1	400.1332010 MHz

F2 - Processing parameters

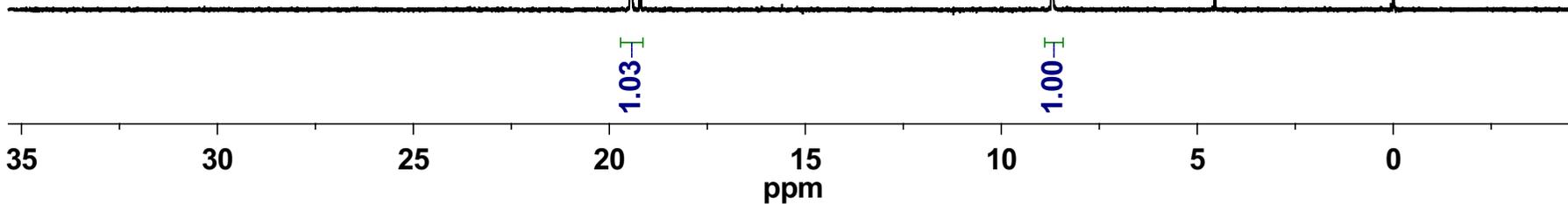
SI	32768
HZpPT	0.219235 Hz
SF	400.1300015 MHz
SR	1.51 Hz
WDW	EM
LB	0.00 Hz
GB	0
SSB	0
PC	4.00



19.48
19.47
19.46
19.45
19.45
19.44
19.43
19.42

8.73
8.72
8.70
8.68
8.68

0.00



Current Data Parameters

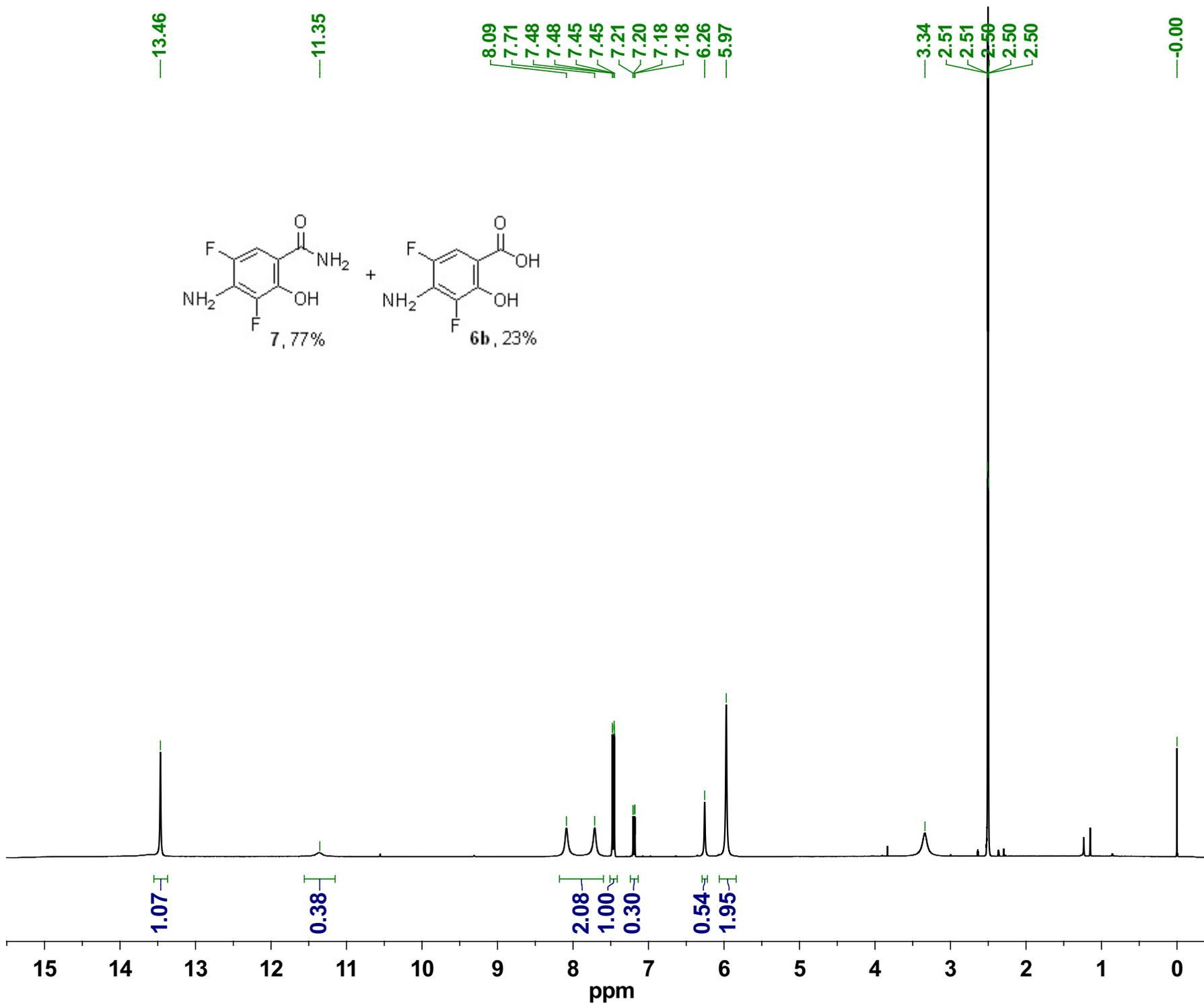
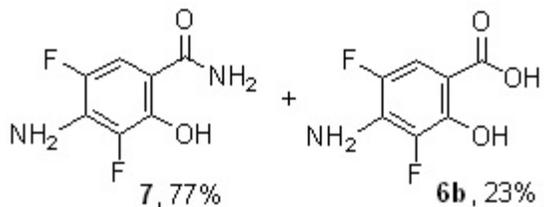
NAME IVS148a
EXPNO 19
PROCNO 1
USER uralnmr

F2 - Acquisition Parameters

Date_ 20160208
Time 13.07
INSTRUM DRX400
PROBHD 5 mm SEF 19F-1
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 16
DS 2
SWH 15060.241 Hz
FIDRES 0.229801 Hz
AQ 2.1758451 sec
RG 4096
DW 33.200 usec
DE 6.00 usec
TE 297.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
==== CHANNEL f1 =====
NUC1 19F
P1 10.10 usec
PL1 0.00 dB
SFO1 376.4429316 MHz

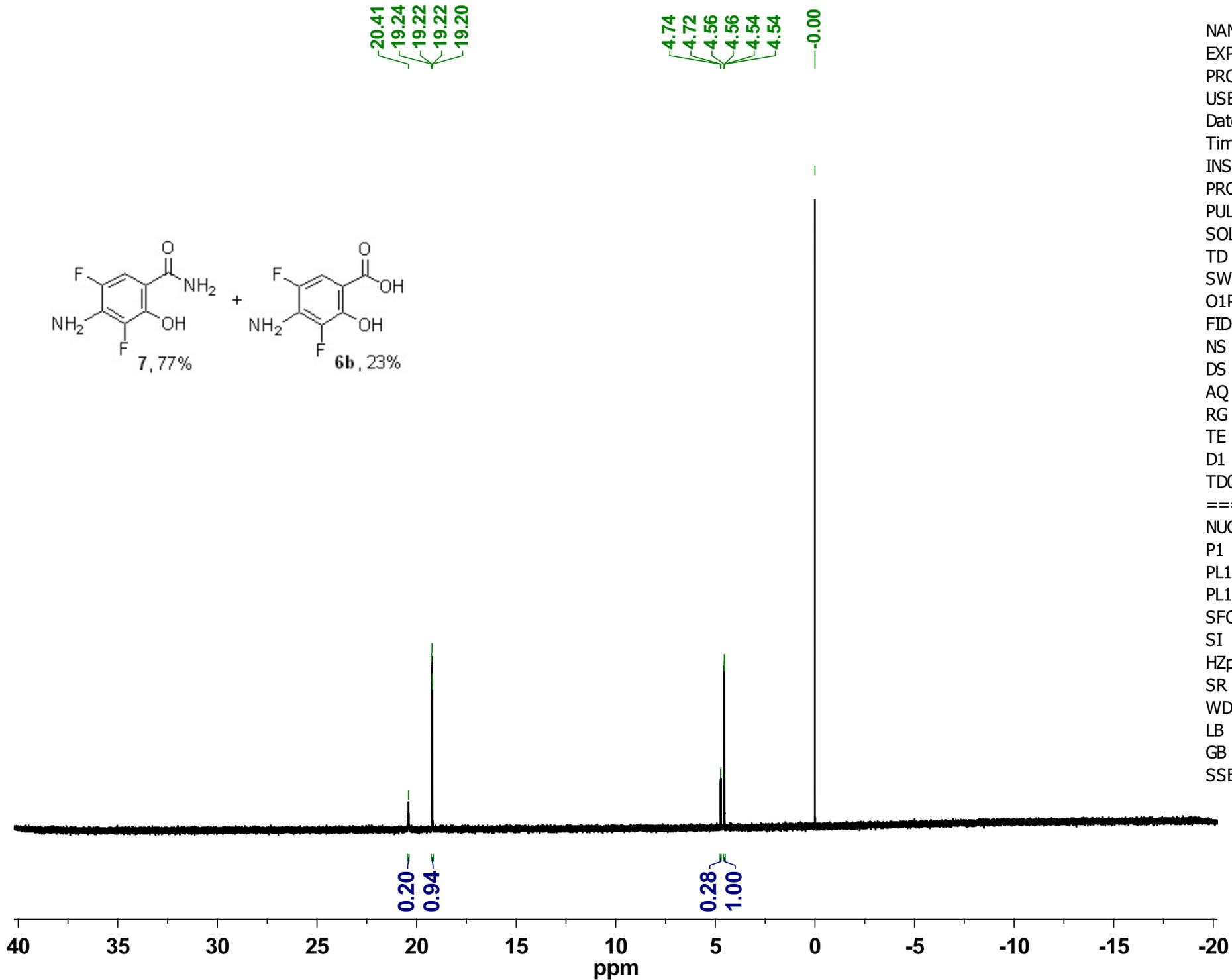
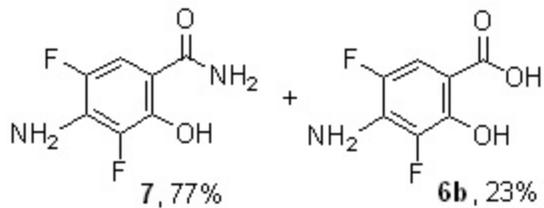
F2 - Processing parameters

SI 65536
HZpPT 0.229801 Hz
SF 376.4371618 MHz
SR -123.22 Hz
WDW EM
LB 0.00 Hz
GB 0
SSB 0
PC 2.00



```

NAME      IVS142d
EXPNO     1
PROCNO    1
USER      uralnmr
Date_     20151119
Time      13.42
INSTRUM   AV500
PROBHD    5 mm PABBO BB-
PULPROG   zg30
SOLVENT   DMSO
TD         32768
SW         16.0214 ppm
O1P       7.500 ppm
FIDRES    0.244532 Hz
NS         16
DS         2
AQ         2.0447731 sec
RG         181
TE         295.7 K
D1         1.00000000 sec
TDO        1
===== CHANNEL f1 =====
NUC1       1H
P1         12.00 usec
PL1        1.00 dB
PL1W       16.10176659 W
SFO1       500.1337510 MHz
SI         32768
HZpPT     0.244532 Hz
SR         3.53 Hz
WDW        EM
LB         0.00 Hz
GB         0
SSB        0
  
```



NAME IVS142d
 EXPNO 19
 PROCNO 1
 USER uralnrm
 Date_ 20151119
 Time 13.49
 INSTRUM AV500
 PROBHD 5 mm PABBO BB-
 PULPROG zgflqn
 SOLVENT DMSO
 TD 131072
 SW 60.3780 ppm
 O1P 10.000 ppm
 FIDRES 0.216744 Hz
 NS 16
 DS 2
 AQ 2.3069172 sec
 RG 203
 TE 295.7 K
 D1 1.00000000 sec
 TD0 1
 ===== CHANNEL f1 =====
 NUC1 19F
 P1 6.00 usec
 PL1 -5.00 dB
 PL1W 46.07103729 W
 SFO1 470.5205852 MHz
 SI 131072
 HZpPT 0.216744 Hz
 SR -1.57 Hz
 WDW EM
 LB 0.00 Hz
 GB 0
 SSB 0