ELECTRONIC SUPPORTING INFORMATION FOR

Catalyst-Free Assembly of δ-Lactam-Based Hydrazide–hydrazone Compounds from 3-Arylglutaconic Anhydrides and Aldazines

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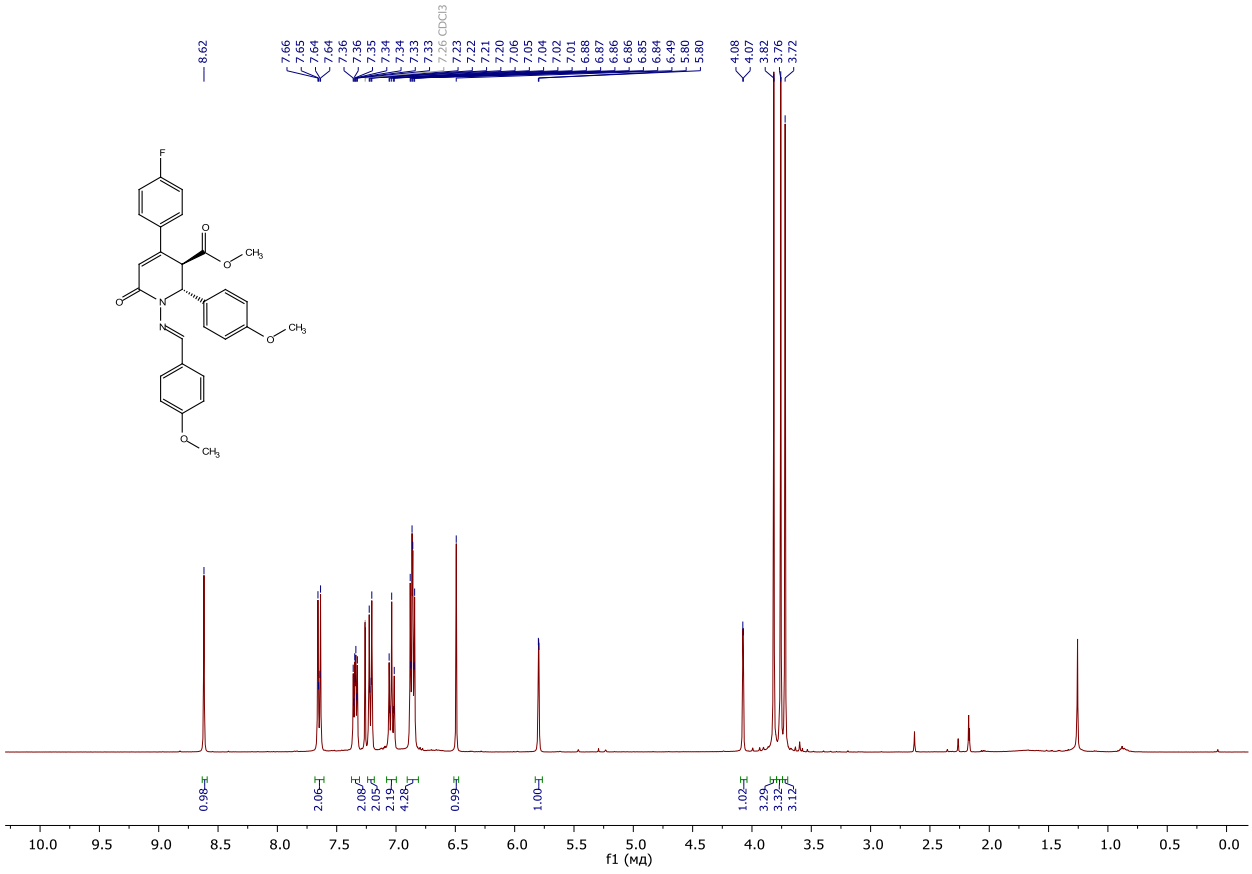
Table S1. Optimization of reaction conditions for preparation of compound 3a

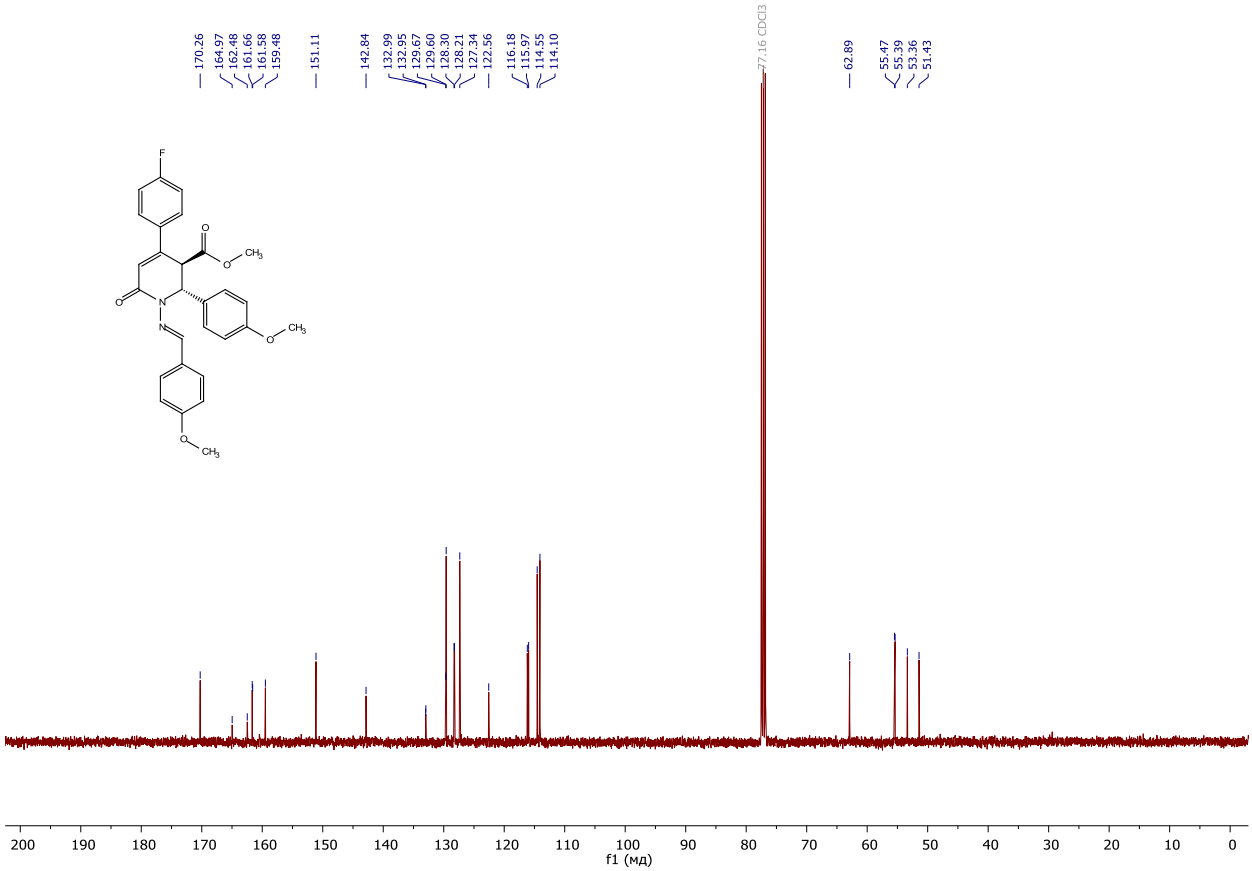
	Reagent	Solvent	T	Loading, equiv.			Yield, %*
				Aldazine **2a**	Anhydride **1a**	Reagent	
	-	DMSO	50	1	2	-	37
1	-	DMSO	80	1	1	-	42
2		DMSO	80	1	2		54
3	-	DMSO	110	1	1	-	39
4	-	DMSO	130	1	1	-	19
5	-	Neat, no solvent	80	1	1		9
6	-	DCE	80	1	2	-	28
7	-	ACN	80	1	2	-	23
8	-	TolH	80	1	2	-	12
9	-	PhH	80	1	2	-	34
11	-	1,4-dioxane	80	1	2	-	9
12	-	Trifluoroethanol	80	1	2	-	28
13	-	DMF	80	1	2	-	40
14	$Sc(OTf)_3$	DMSO	80	1	1	0.1	44
15	BF_3*Et_2O	DMSO	80	1	1	0.1	36
16	DIPEA	DMSO	80	1	1	0.1	32
17	$Yb(OTf)_3$	DMSO	80	1	1	0.1	37
18	$In(OTf)_3$	DMSO	80	1	1	0.1	37
19	$Zn(OTf)_2$	DMSO	80	1	1	0.1	41
20	$Cu(OTf)_2$	DMSO	80	1	1	0.1	19
21	3,4-di$C_6H_5B(OH)_2$	DMSO	80	1	1	0.1	39

* NMR yields were calculated using internal standard (dibromomethane)

Copies of ^{1}H, ^{13}C and ^{19}F NMR spectra of prepared compounds

^{1}H, ^{13}C NMR and ^{19}F spectra of compound **3a**



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O
CH3
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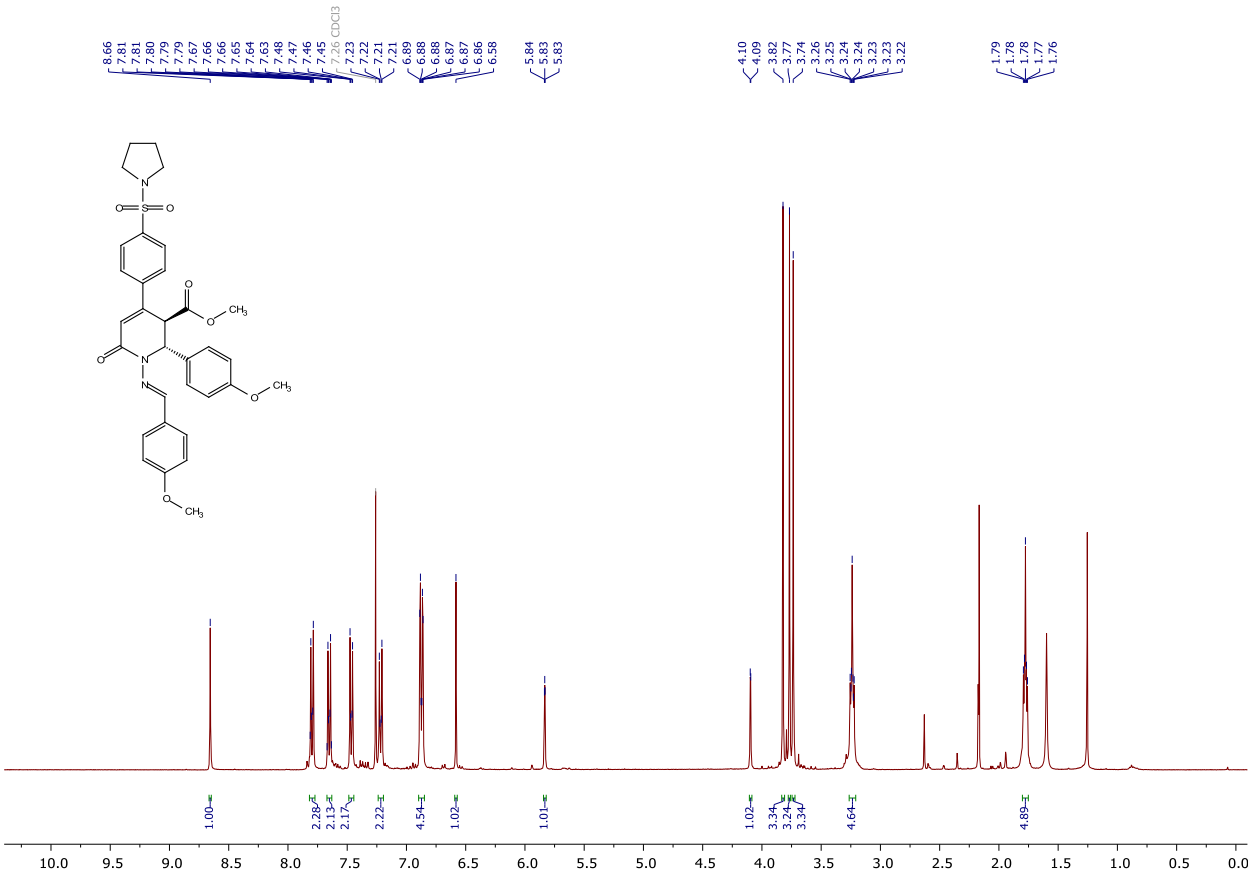
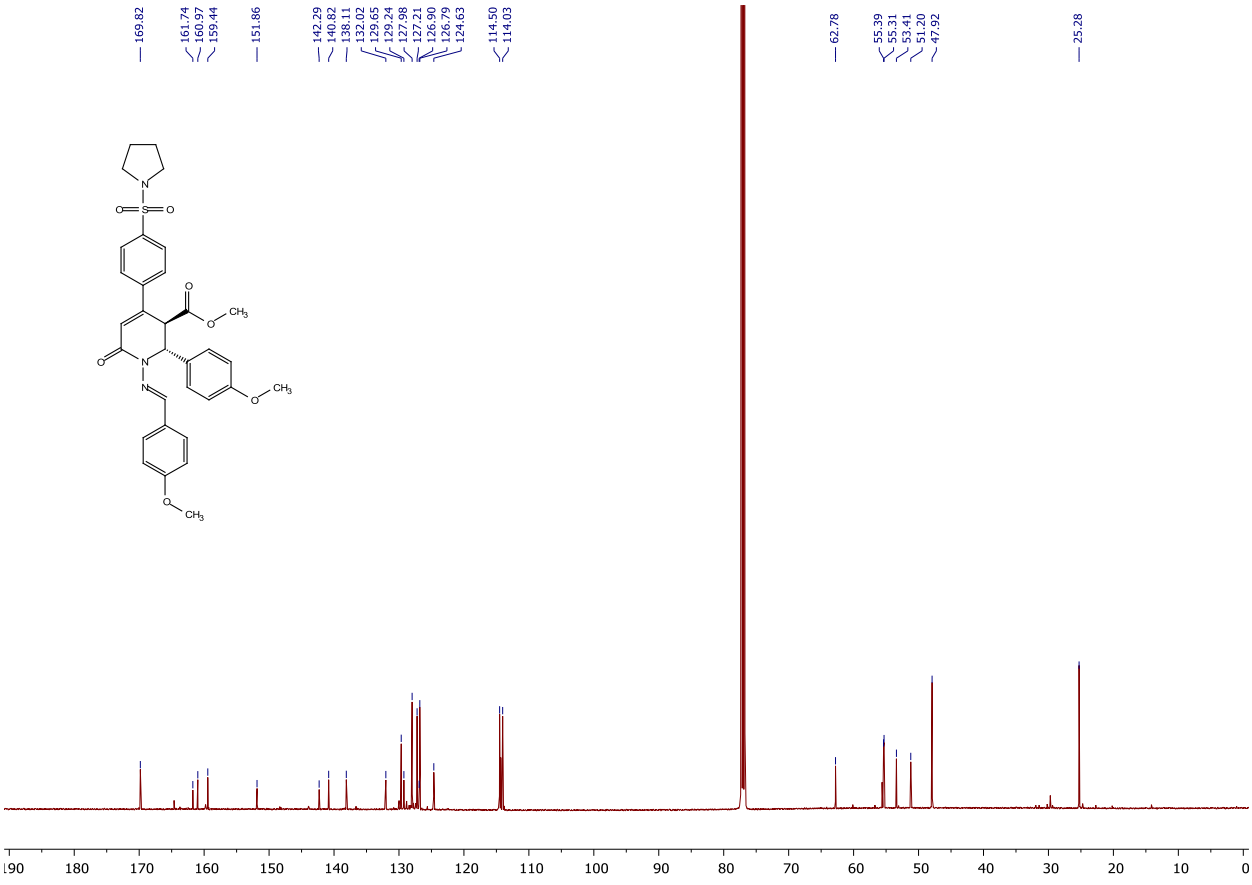
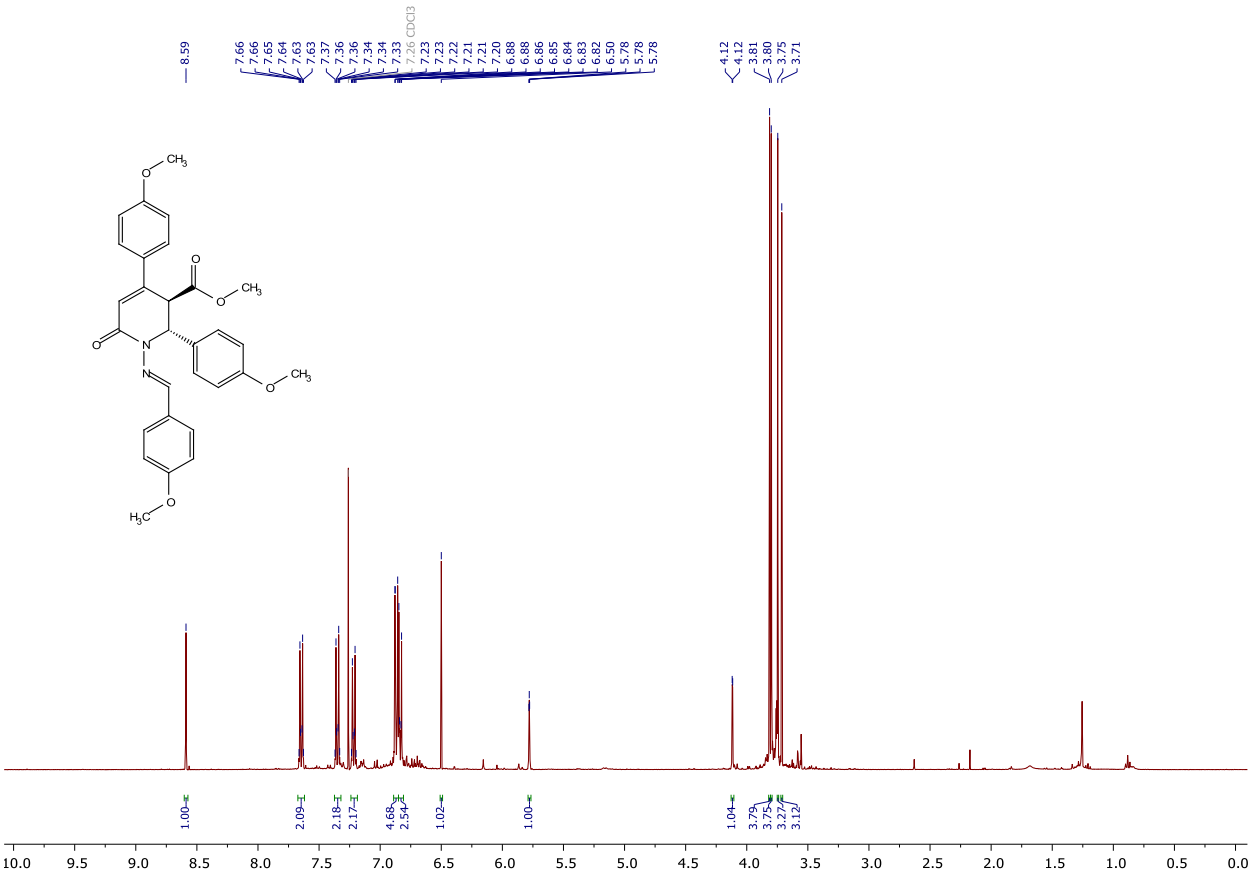
f1 (мд)

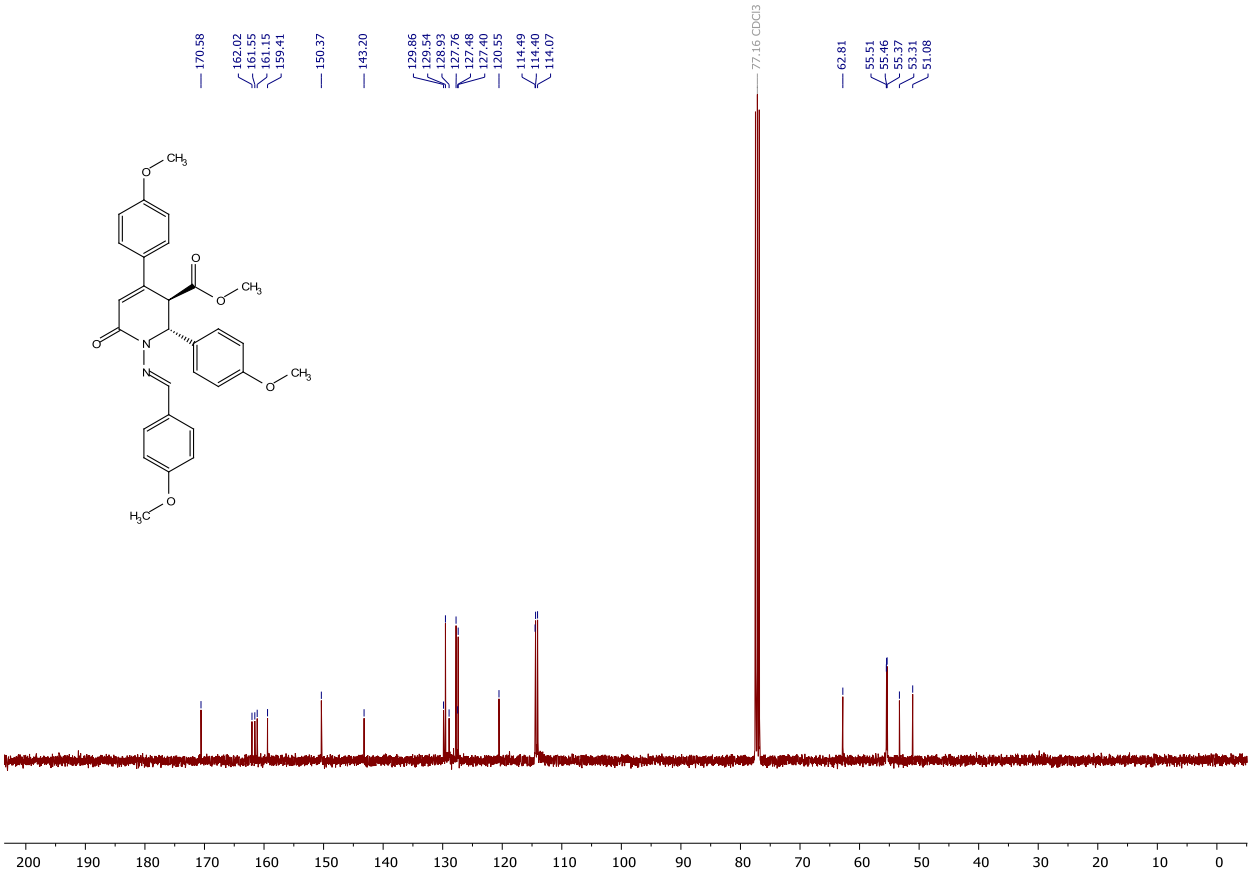
^{1}H and ^{13}C NMR spectra of compound **3b**



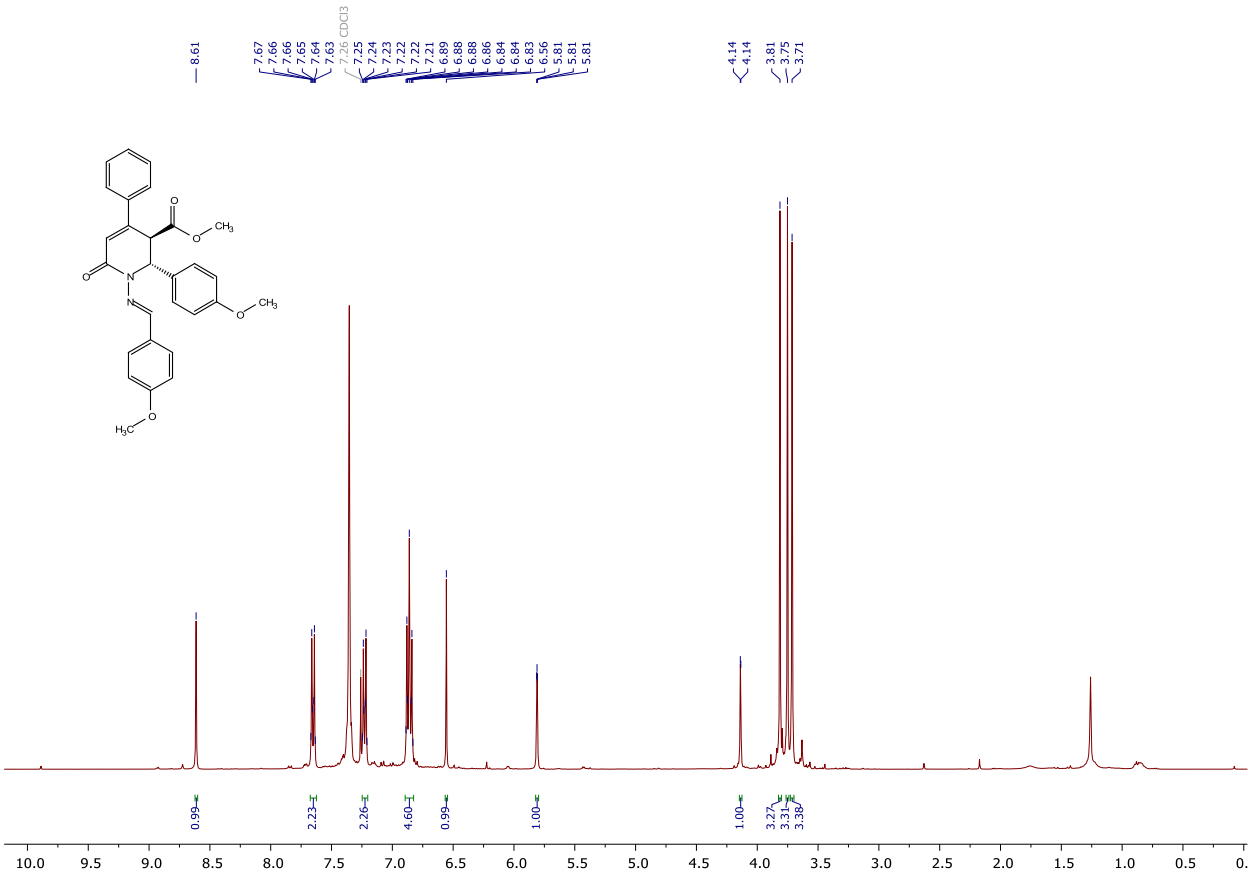


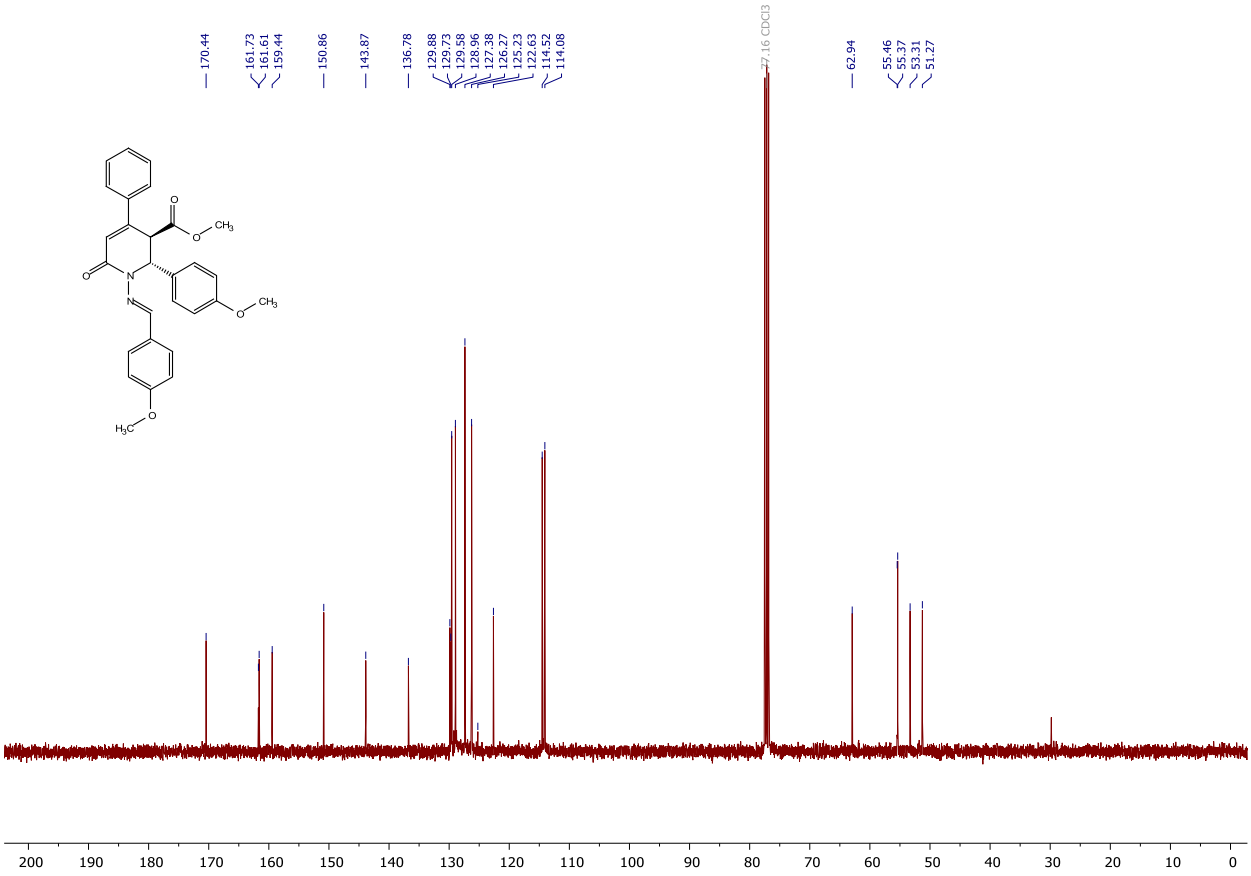
^{1}H and ^{13}C NMR spectra of compound **3c**



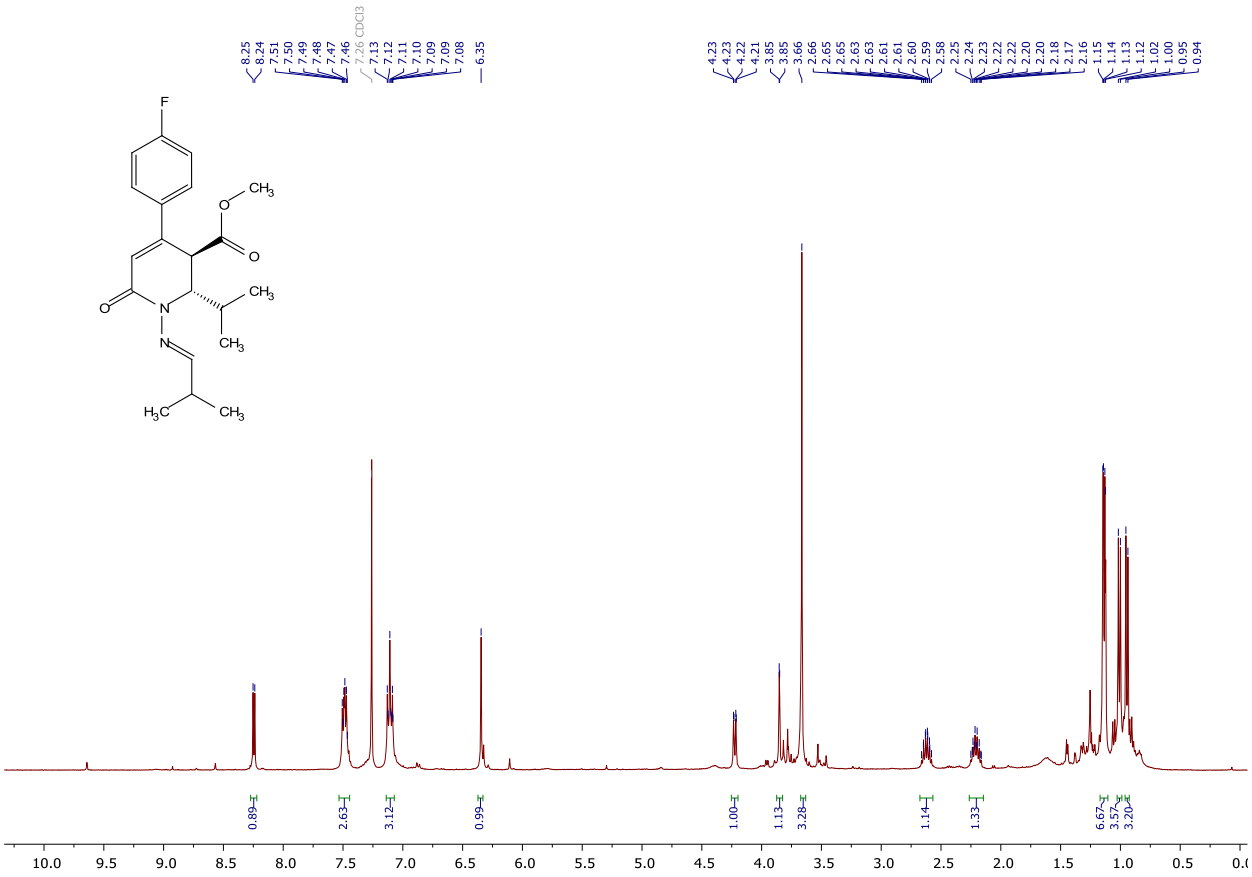


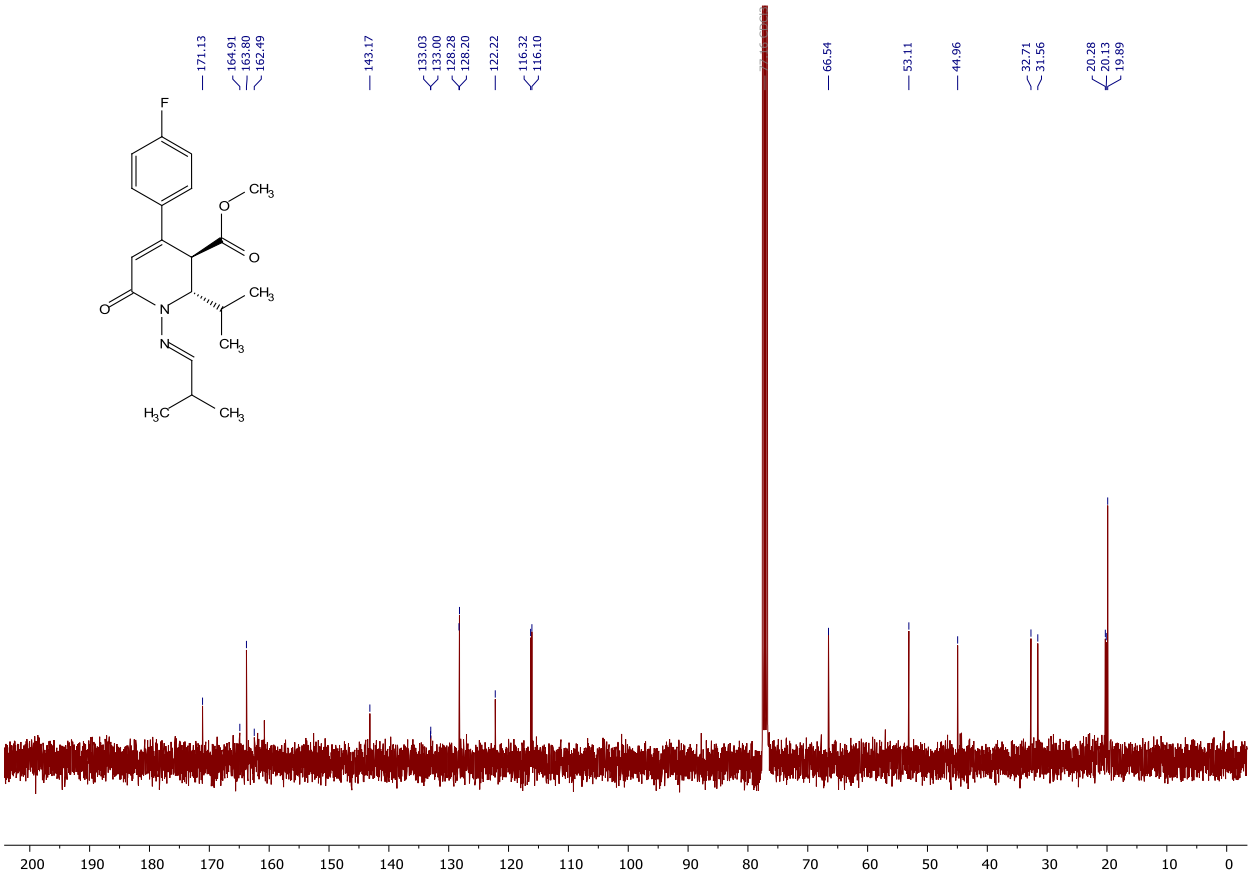
^{1}H and ^{13}C NMR spectra of compound **3d**

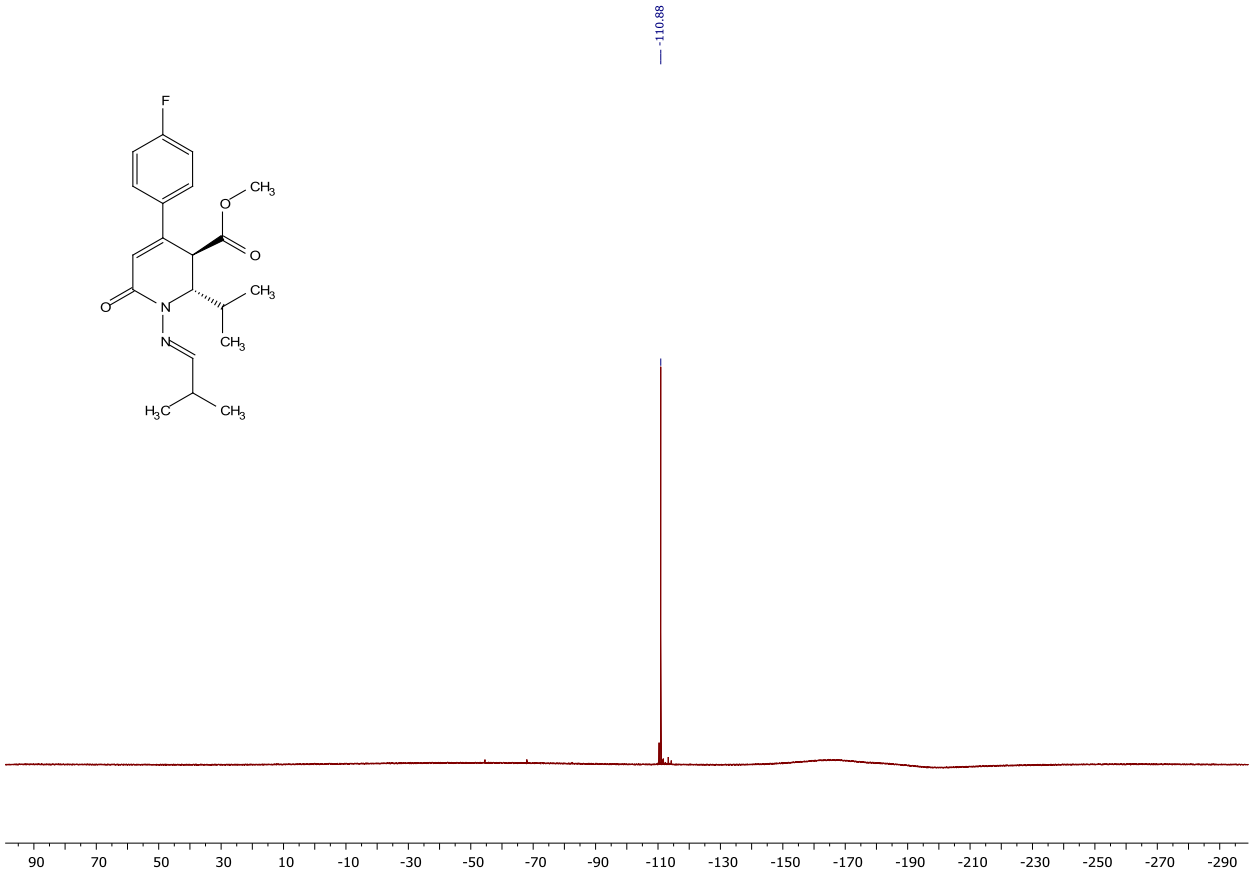




^{1}H, ^{13}C NMR and ^{19}F spectra of compound **3e**



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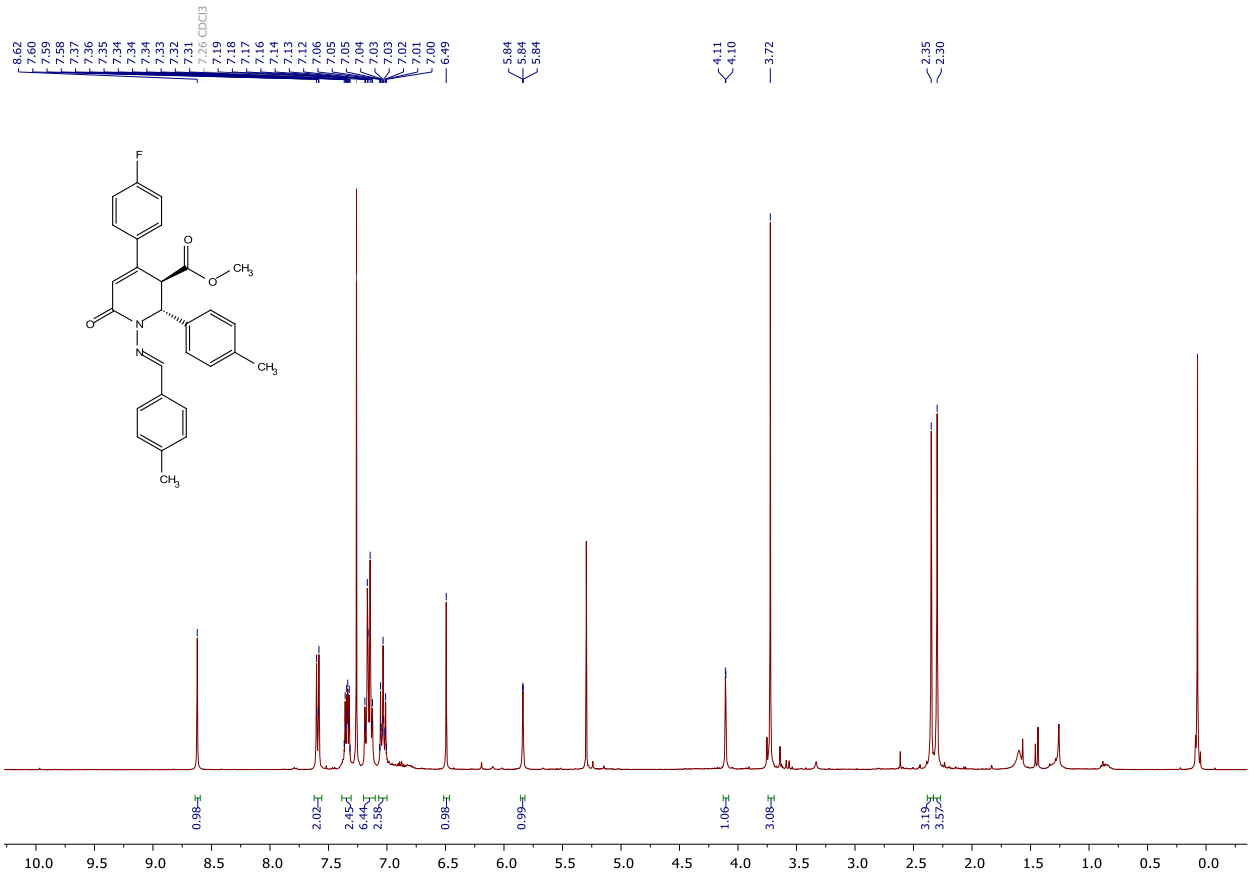
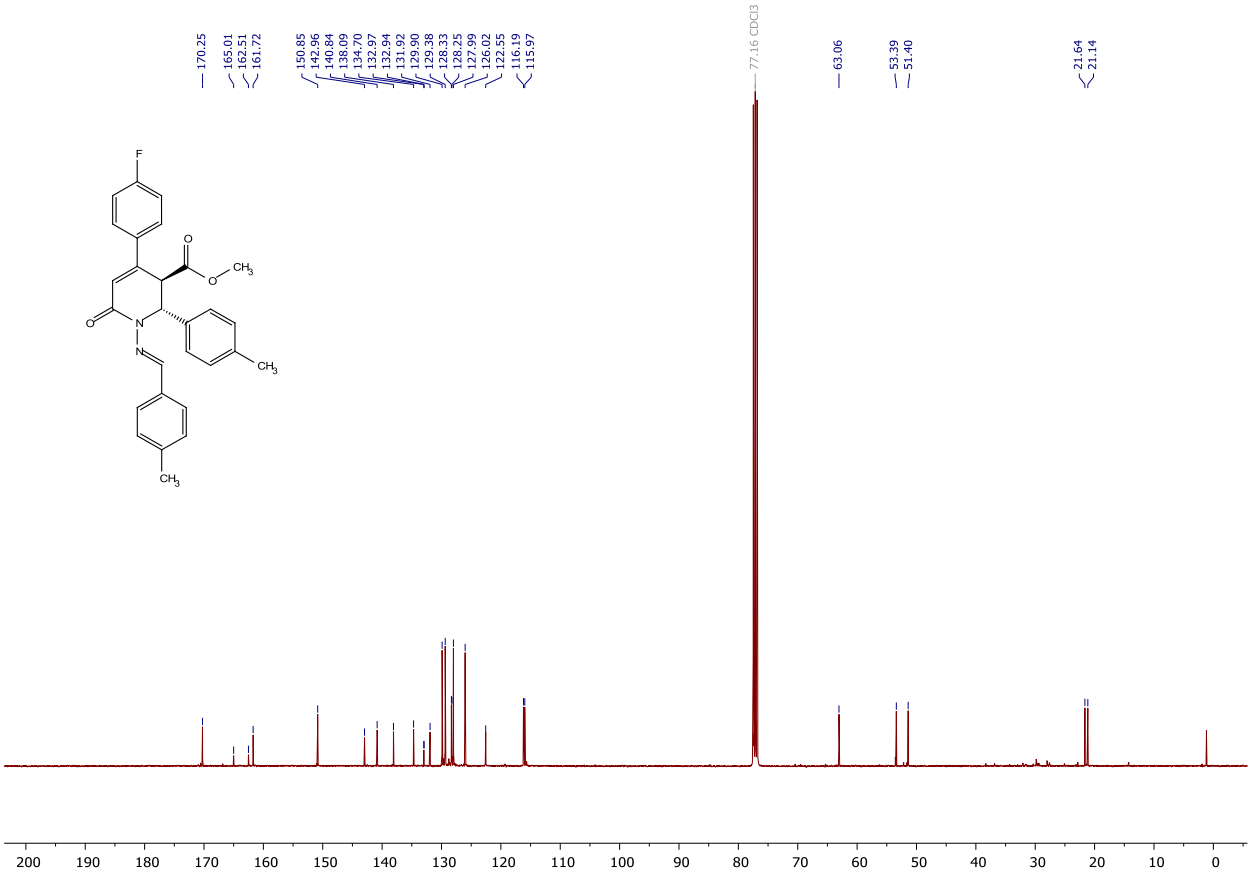
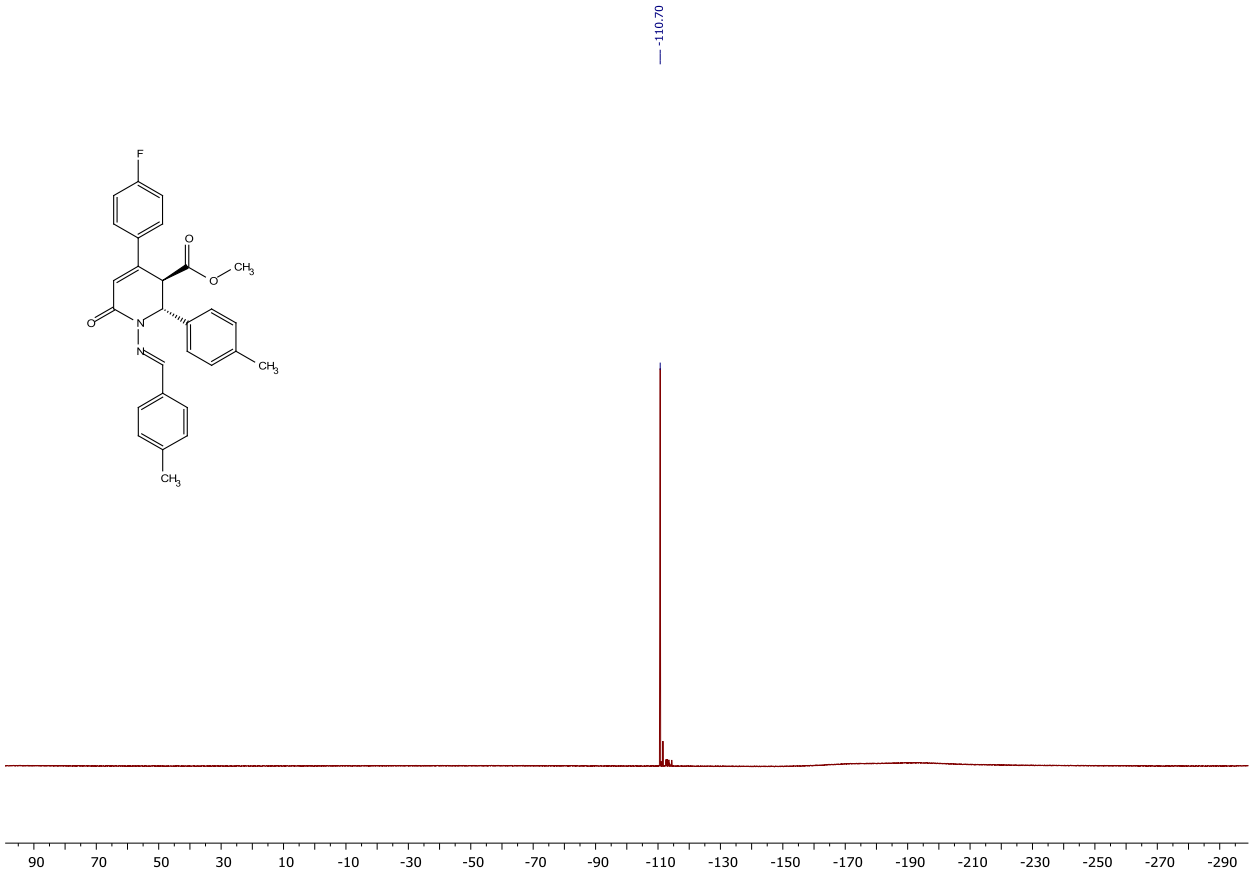
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **3f**



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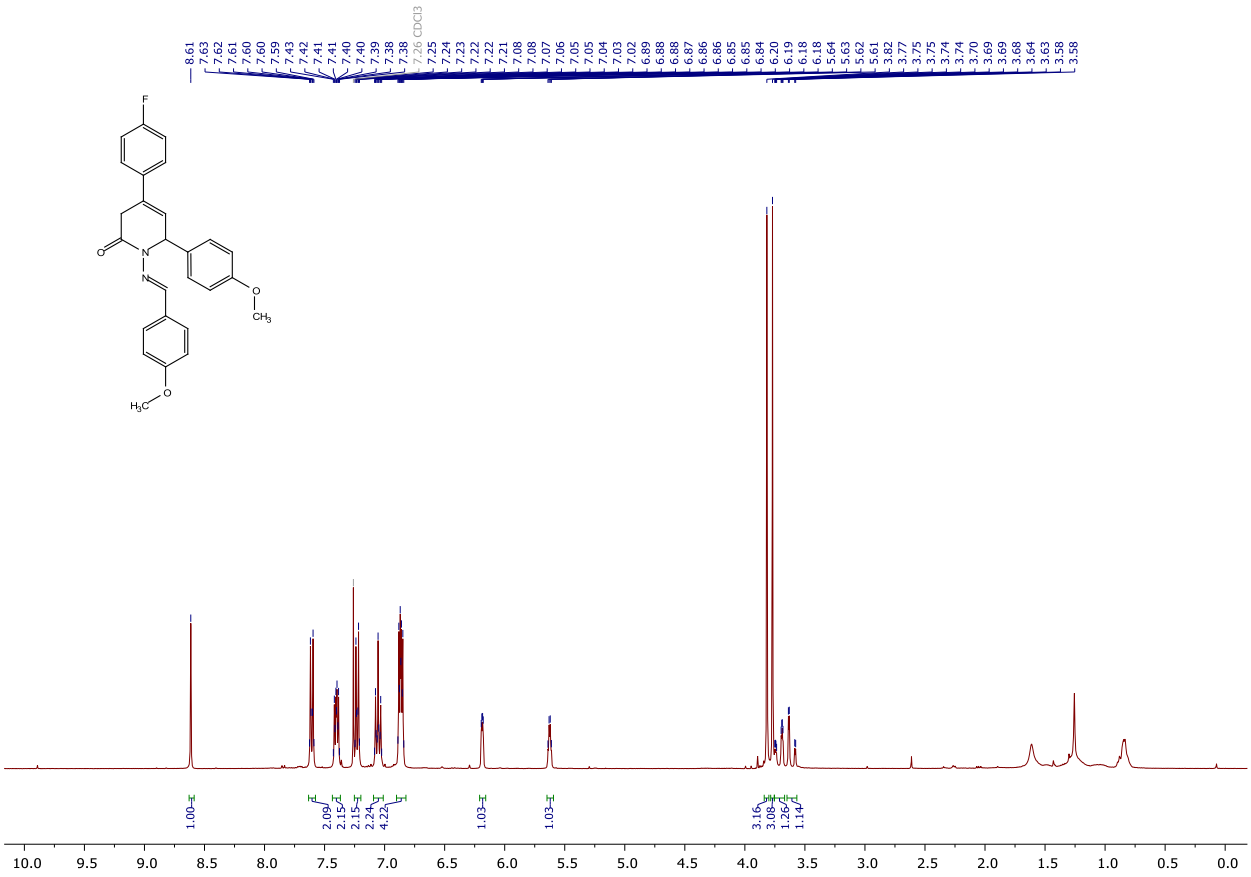
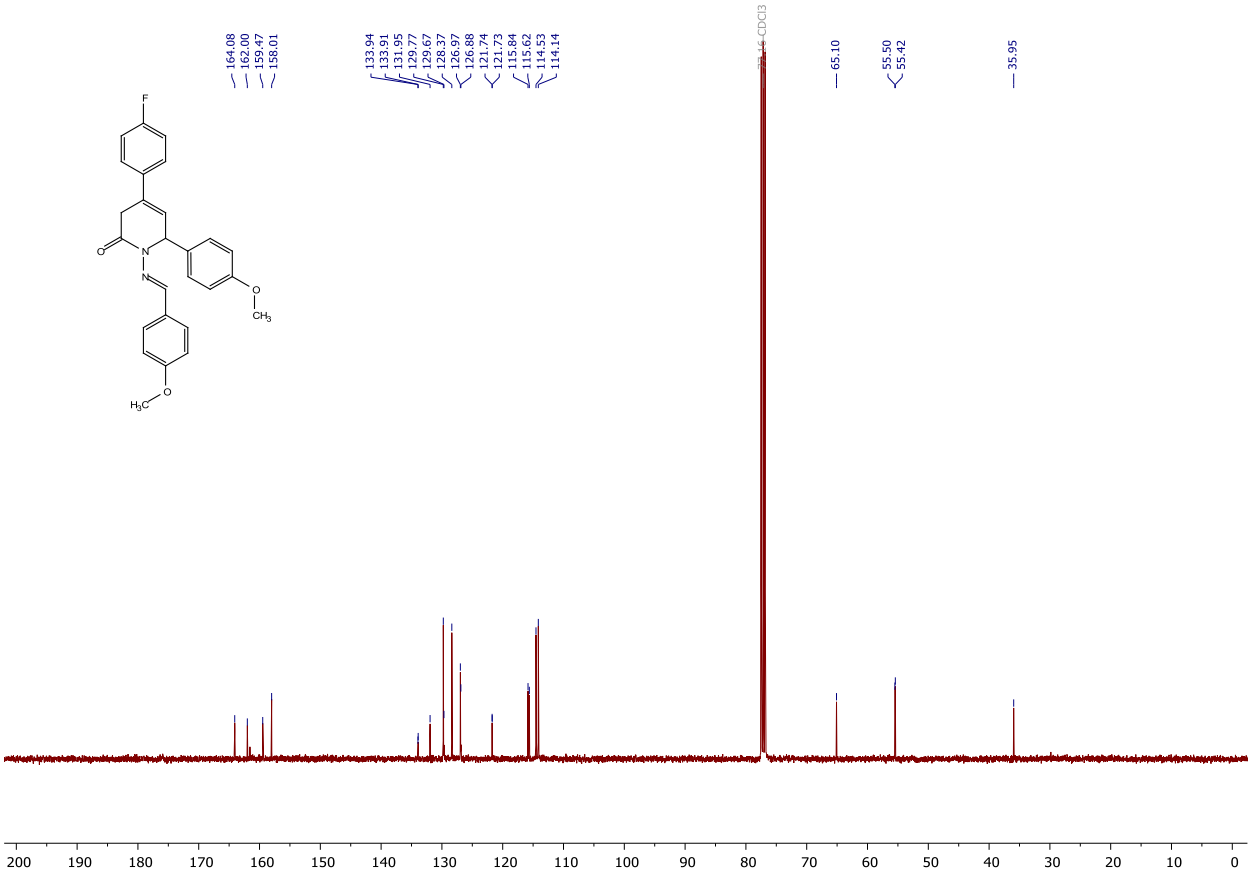
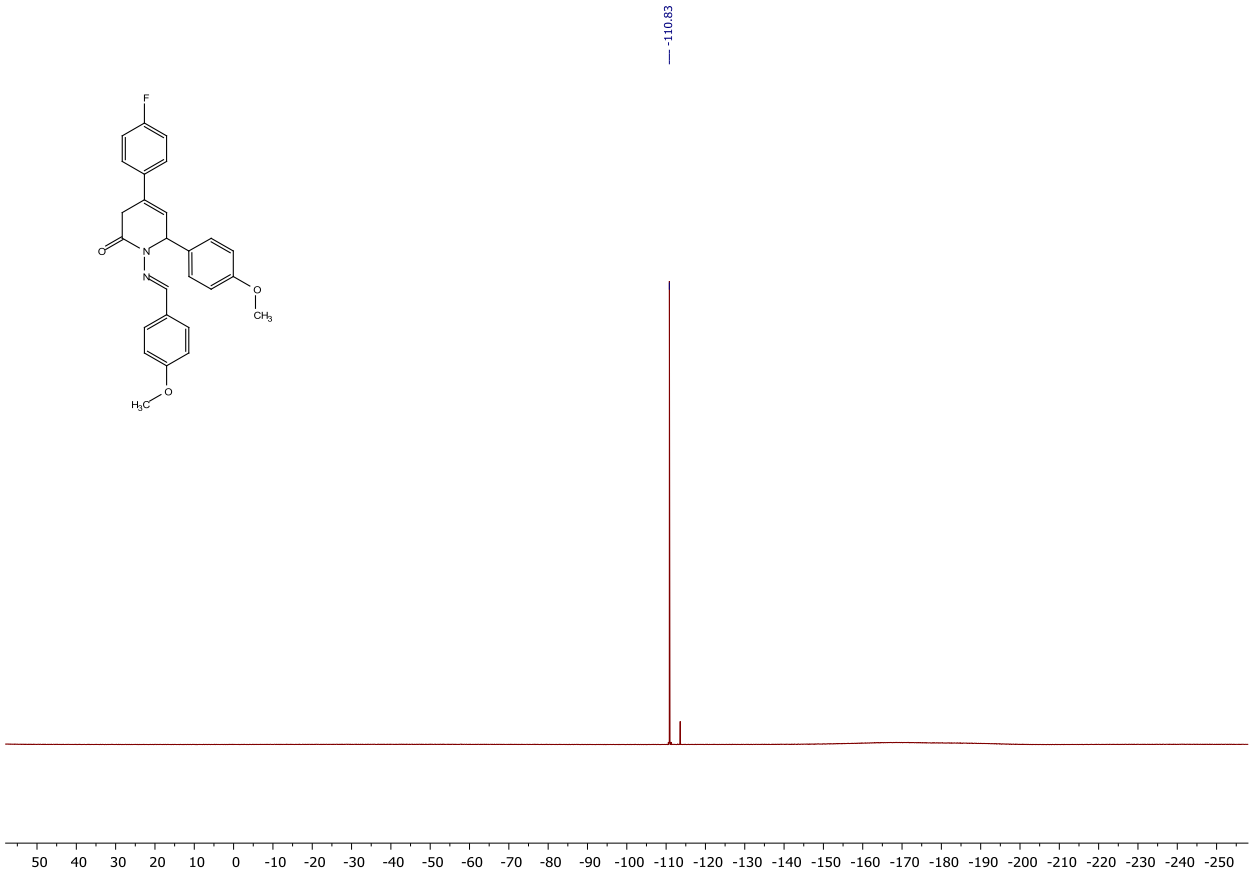
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **4a**



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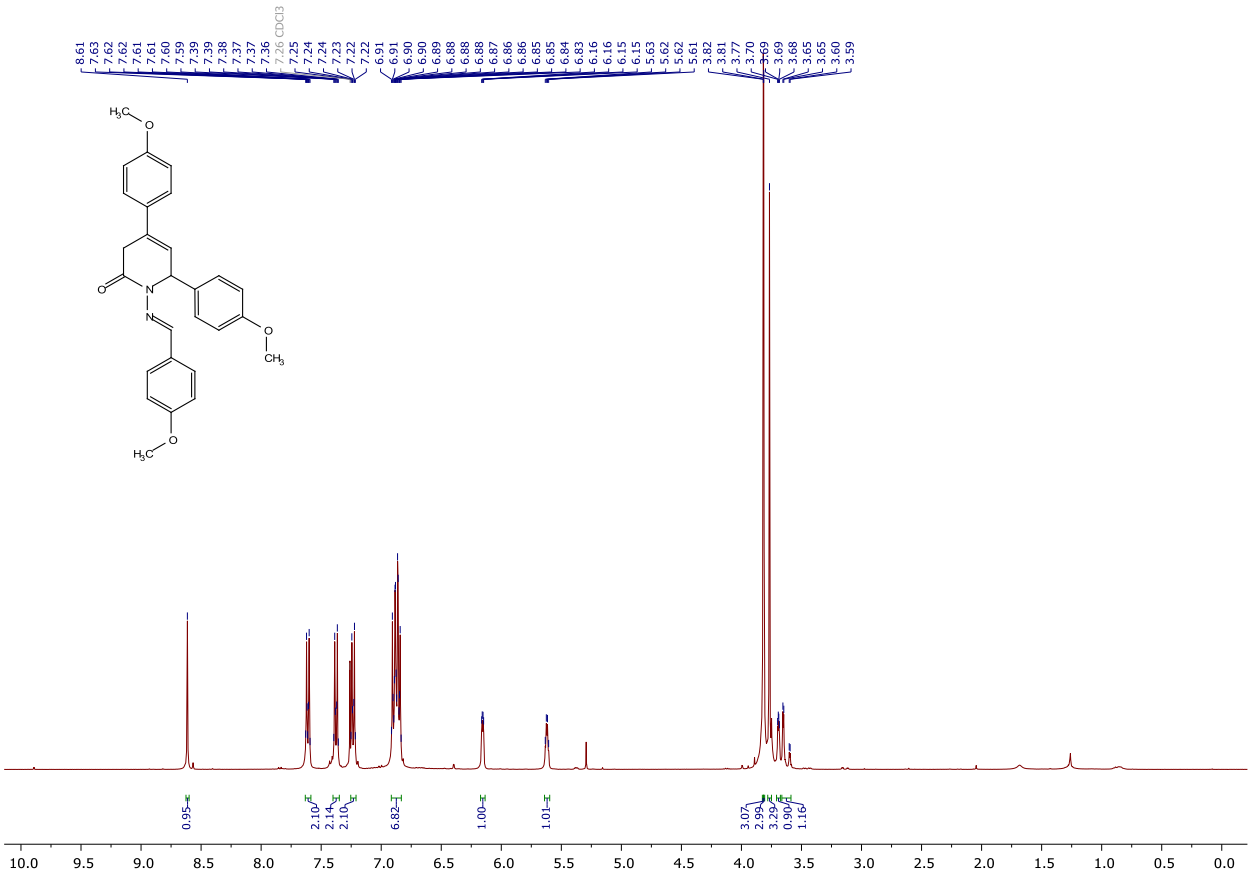
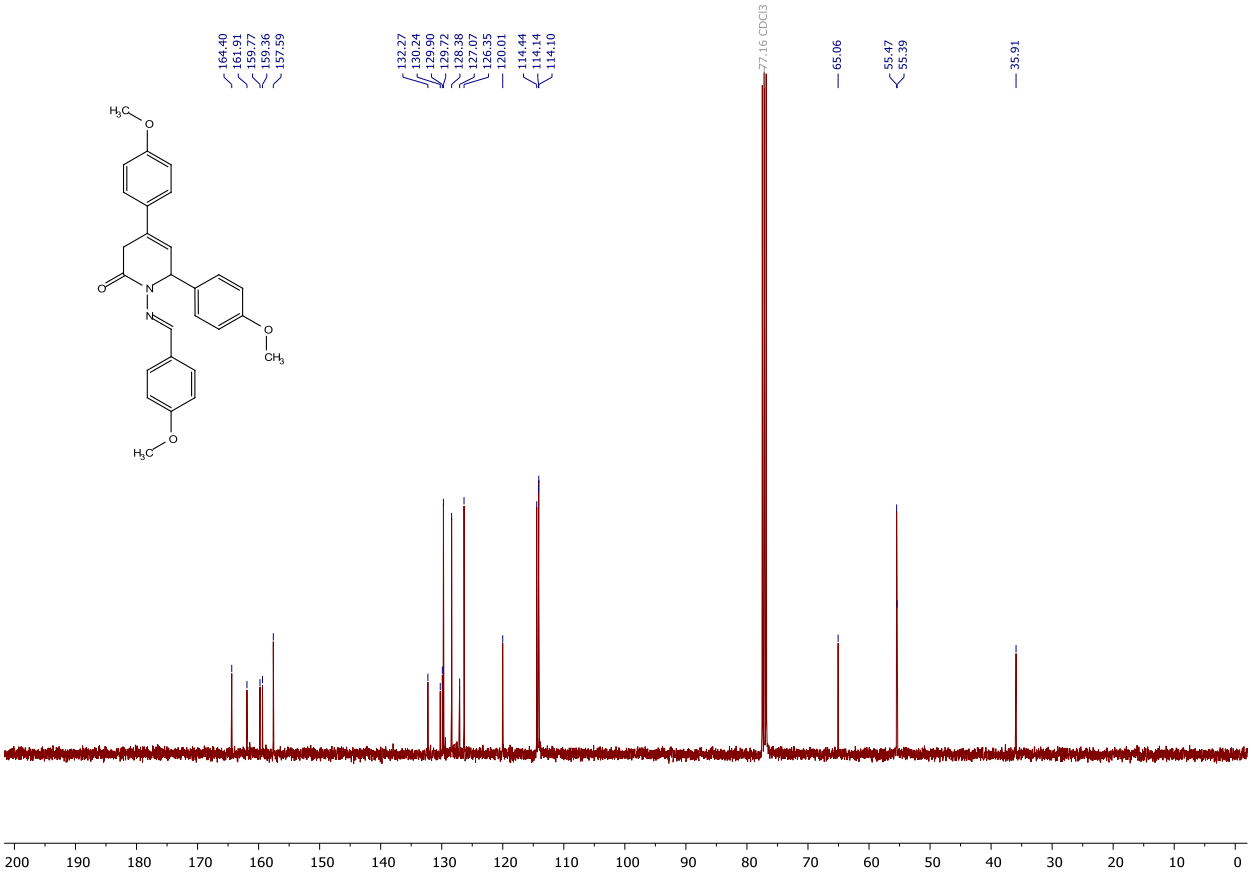
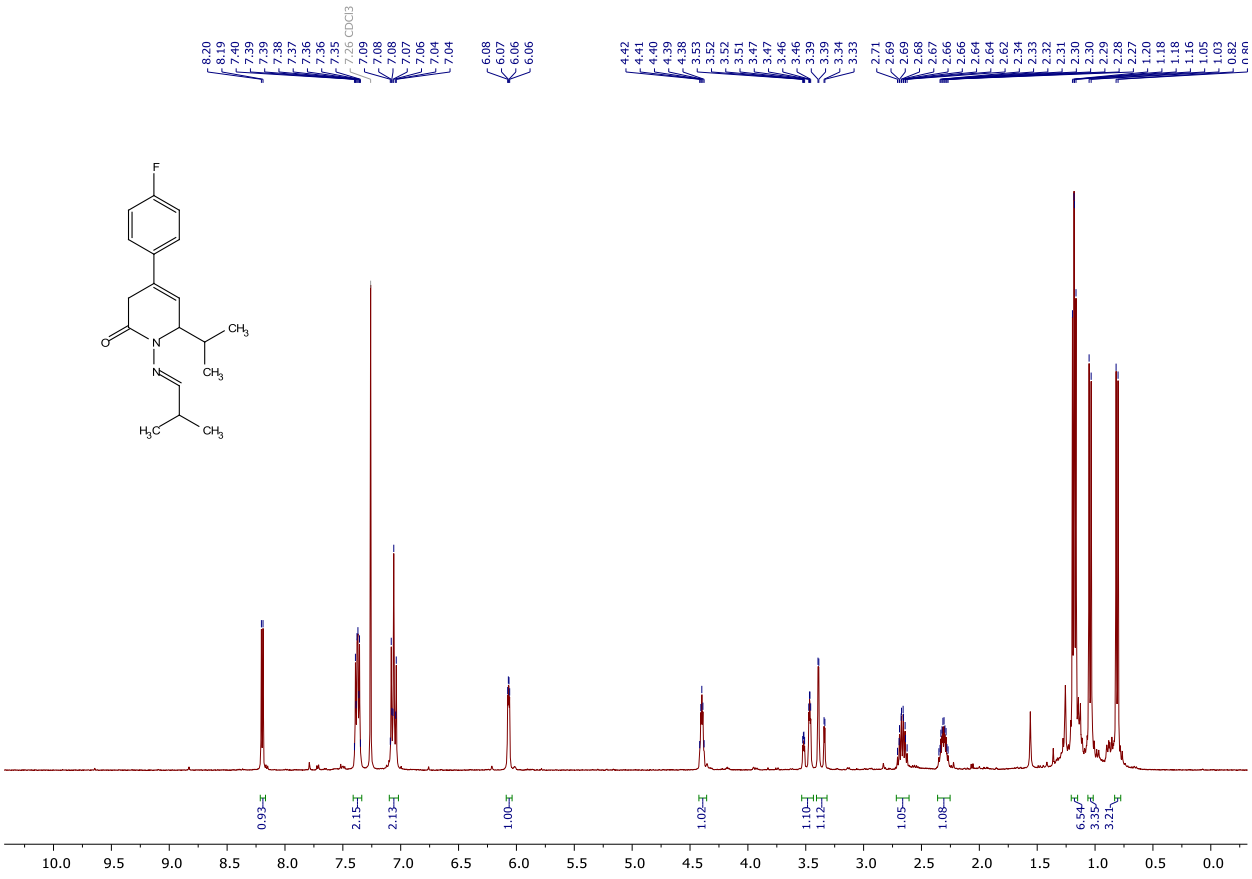
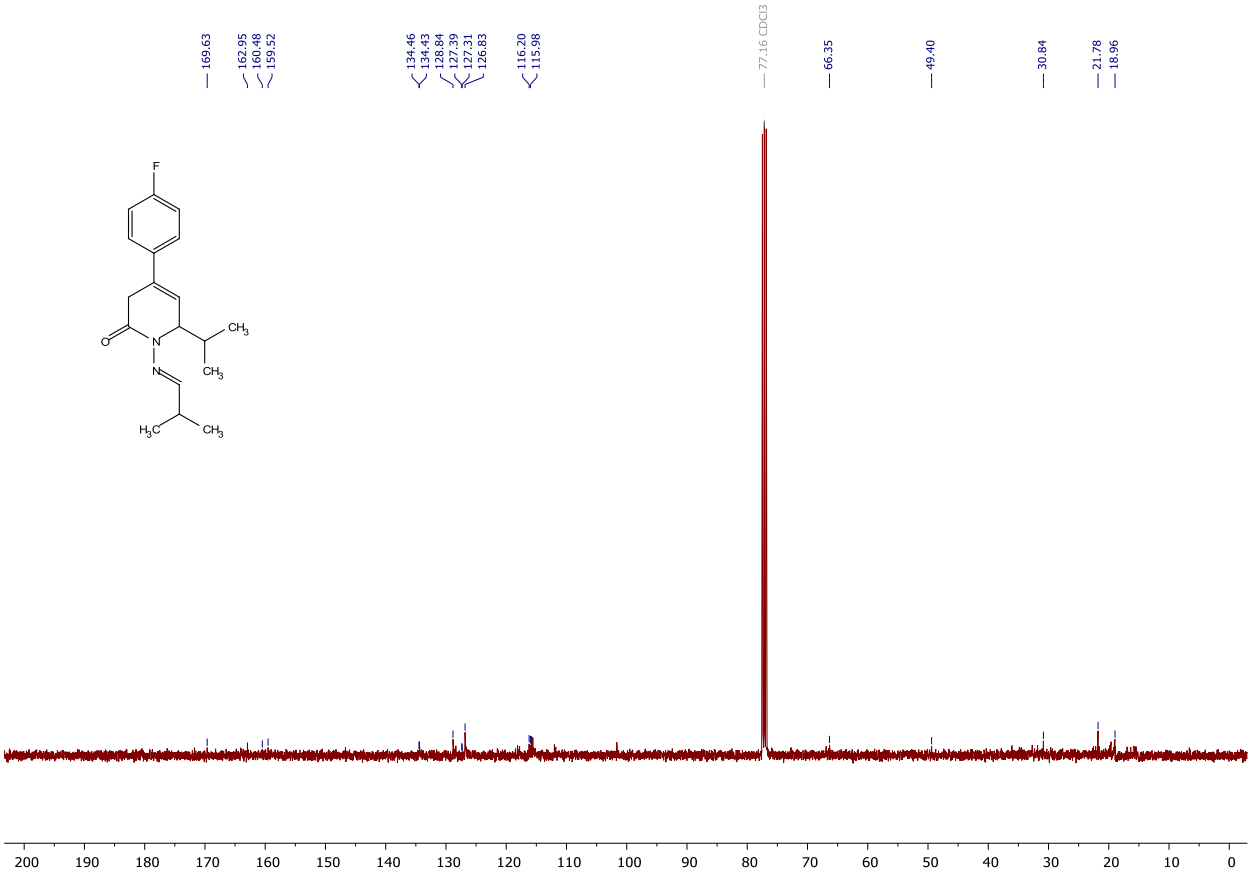
^{1}H and ^{13}C NMR spectra of compound **4b**



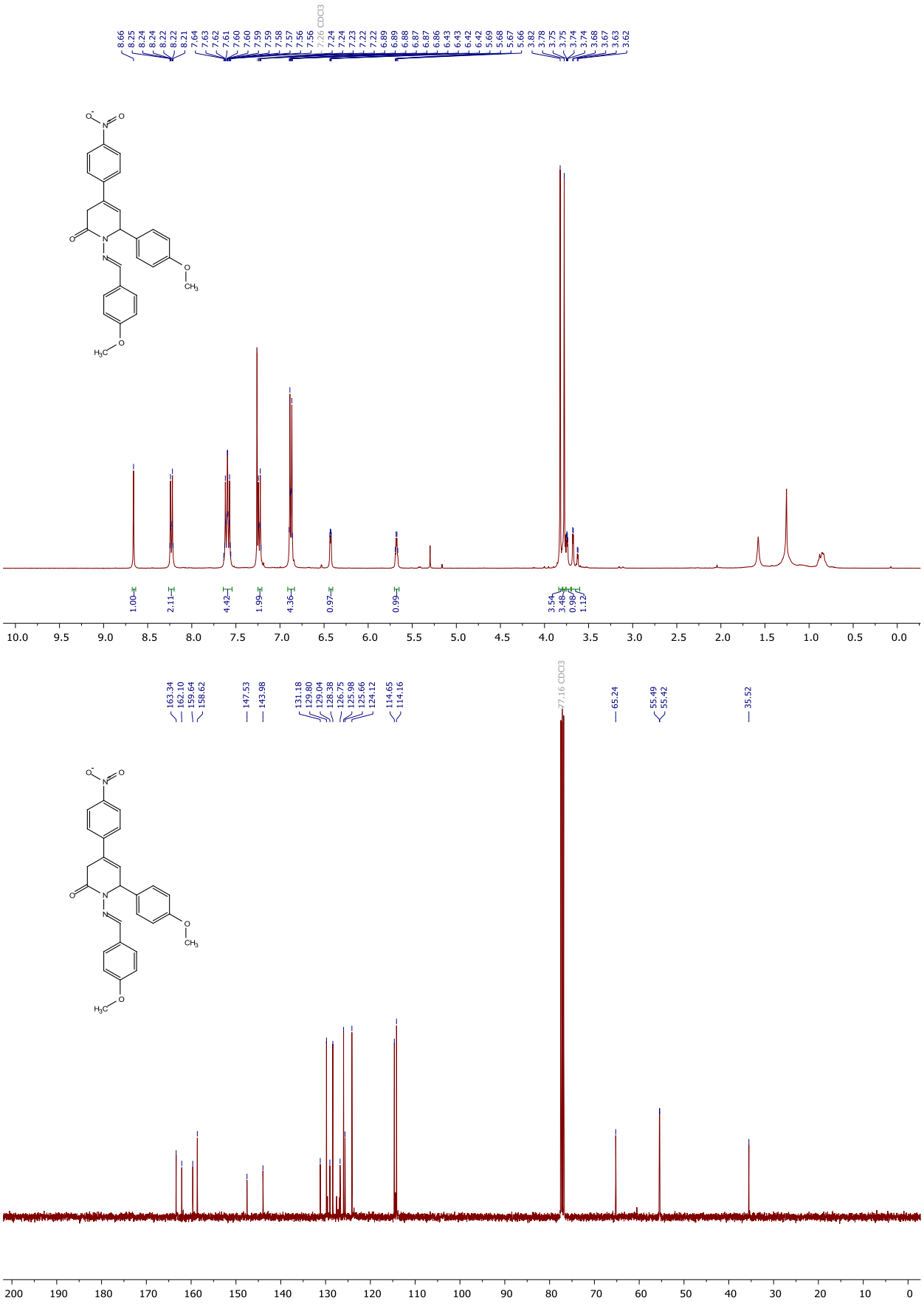


^{1}H and ^{13}C NMR spectra of compound **4c**

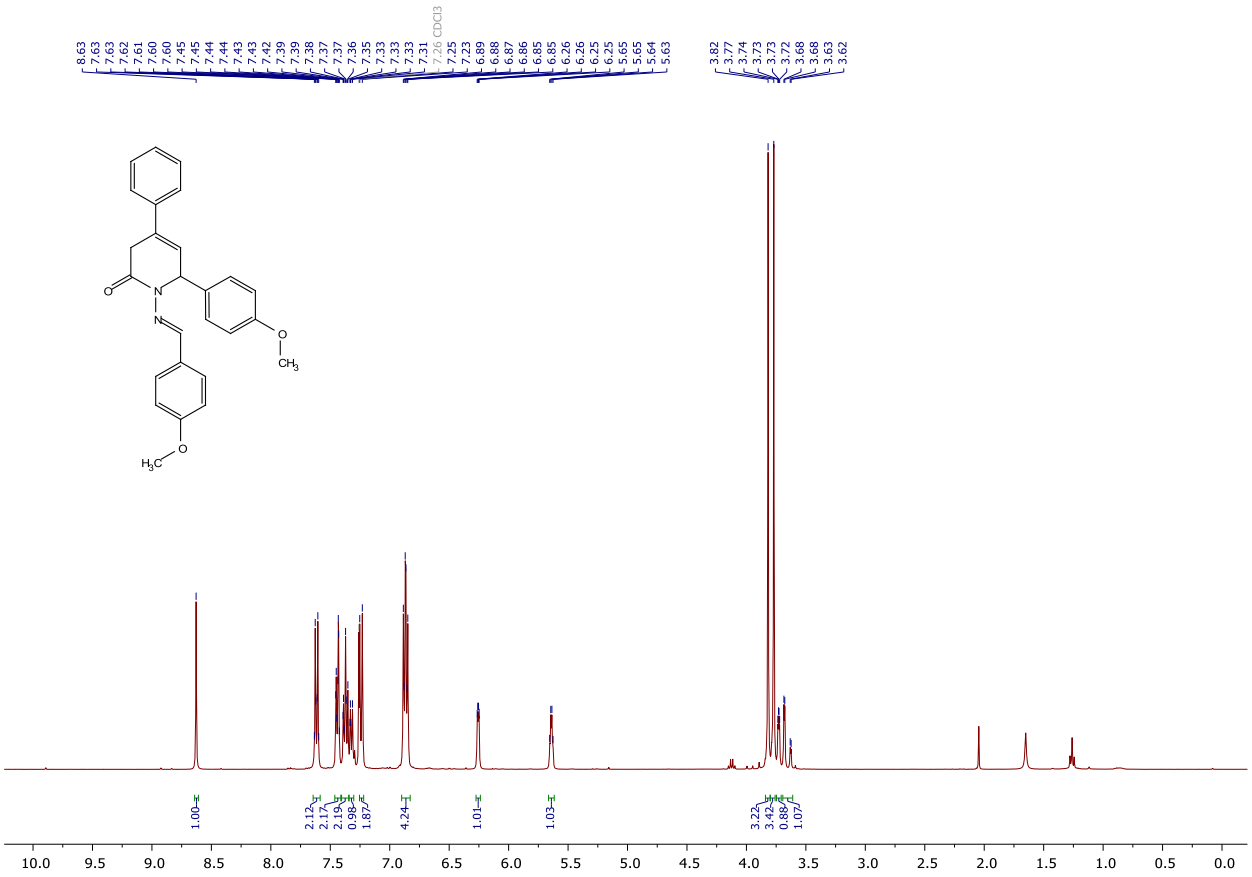


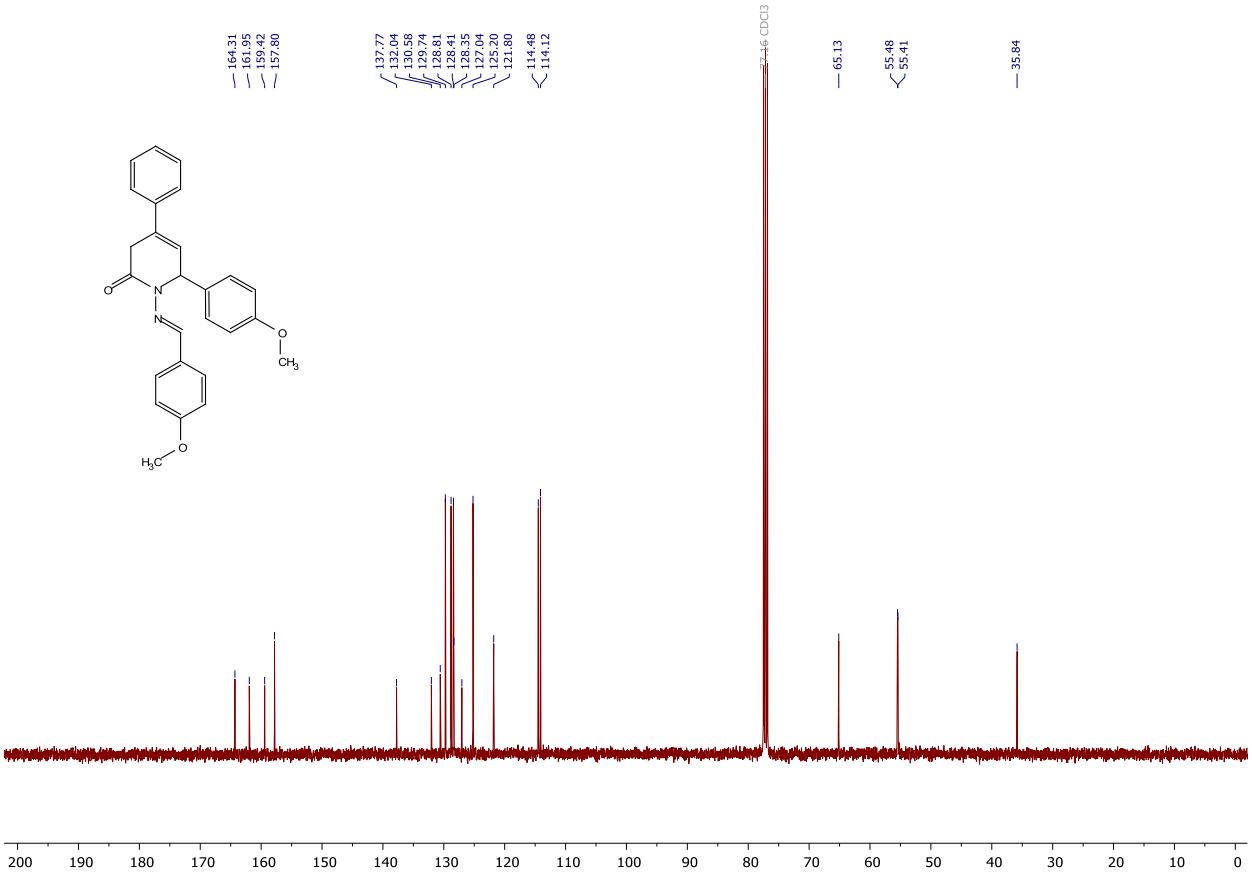


^{1}H and ^{13}C NMR spectra of compound **4d**

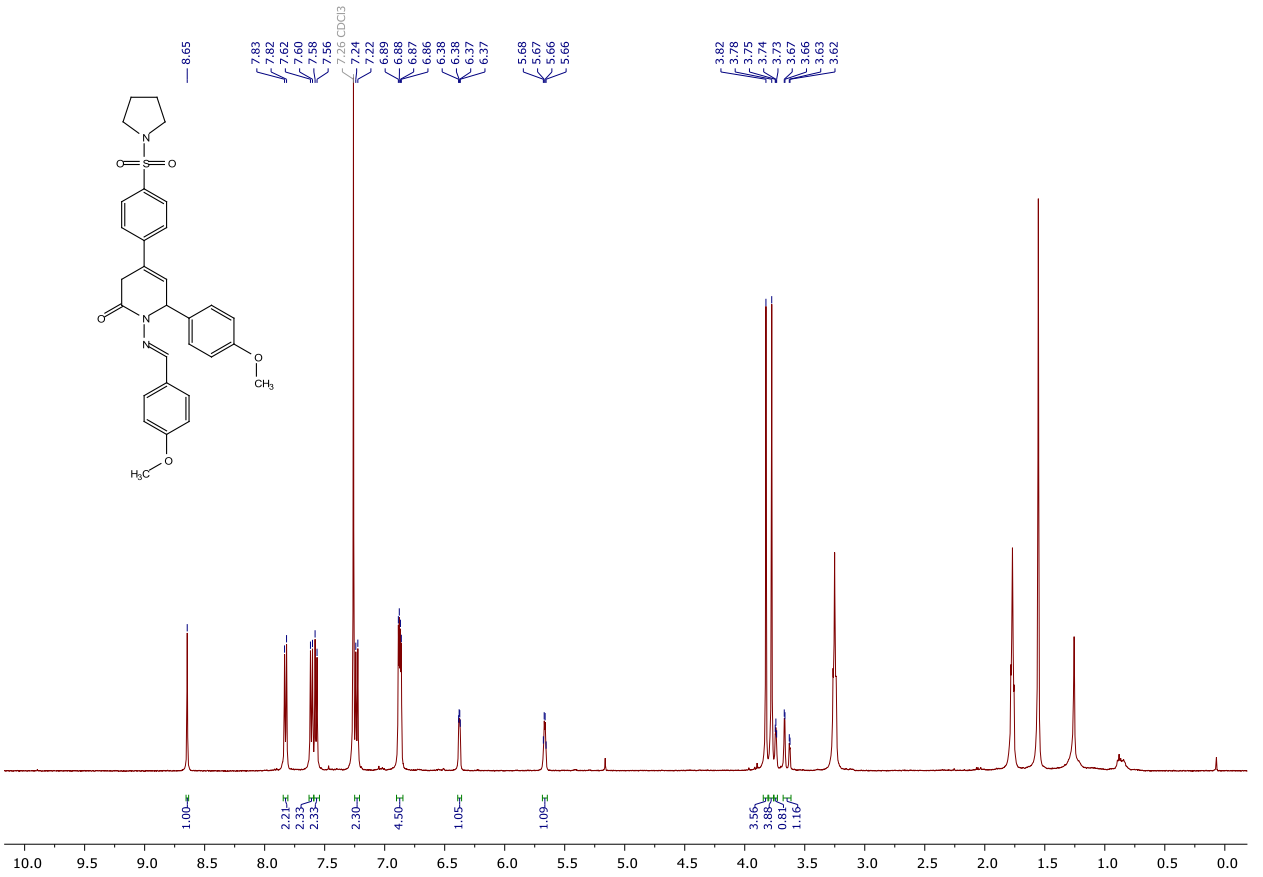


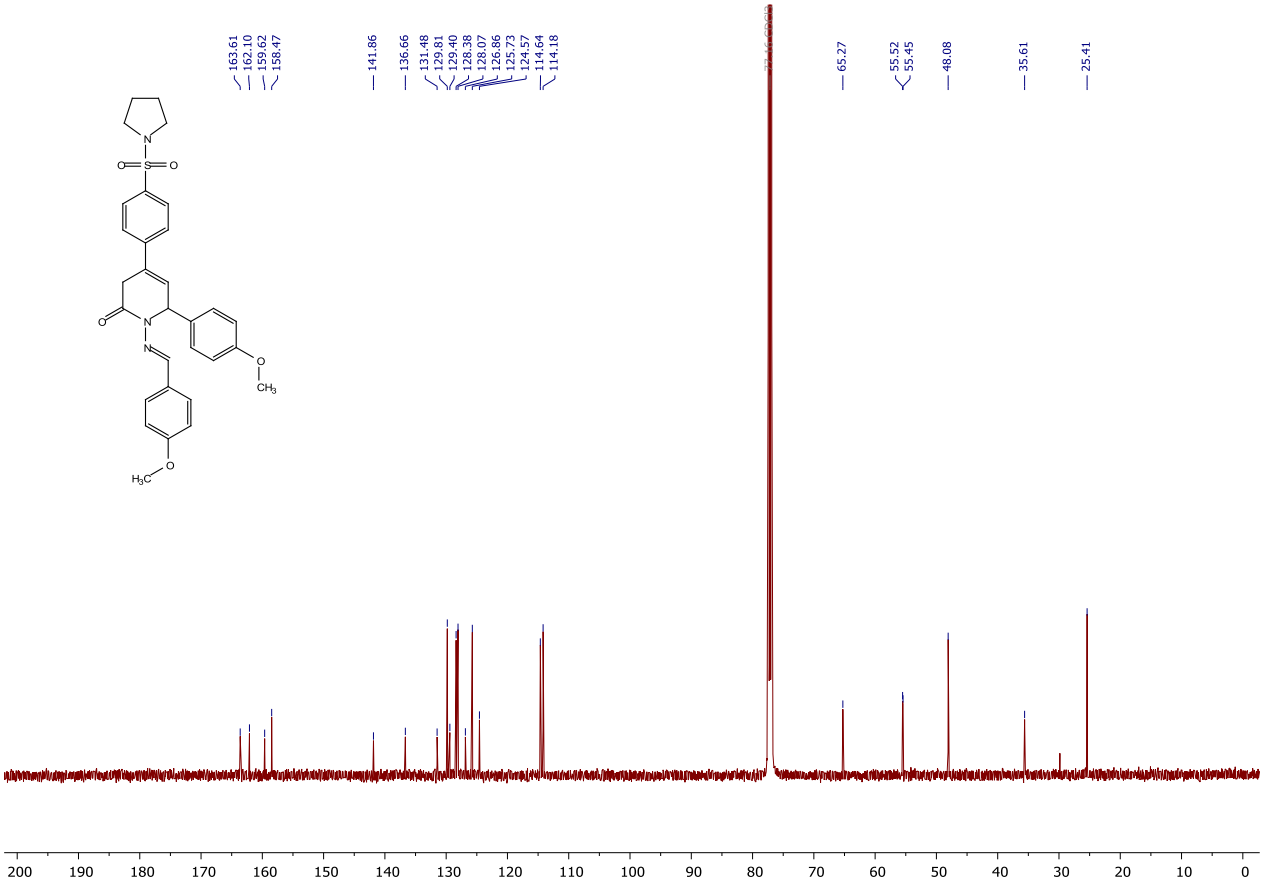
^{1}H and^{13}C NMR and ^{19}F spectra of compound **4e**



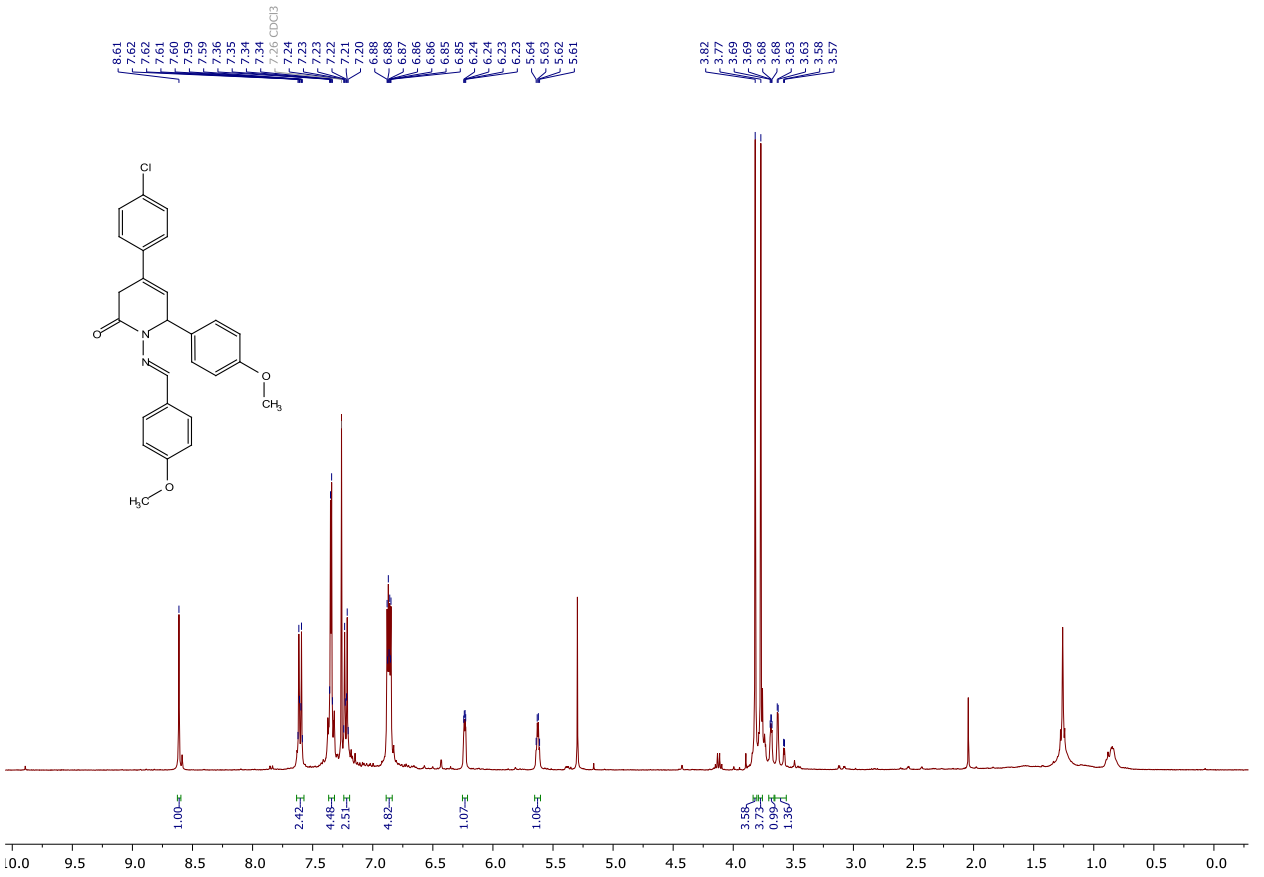


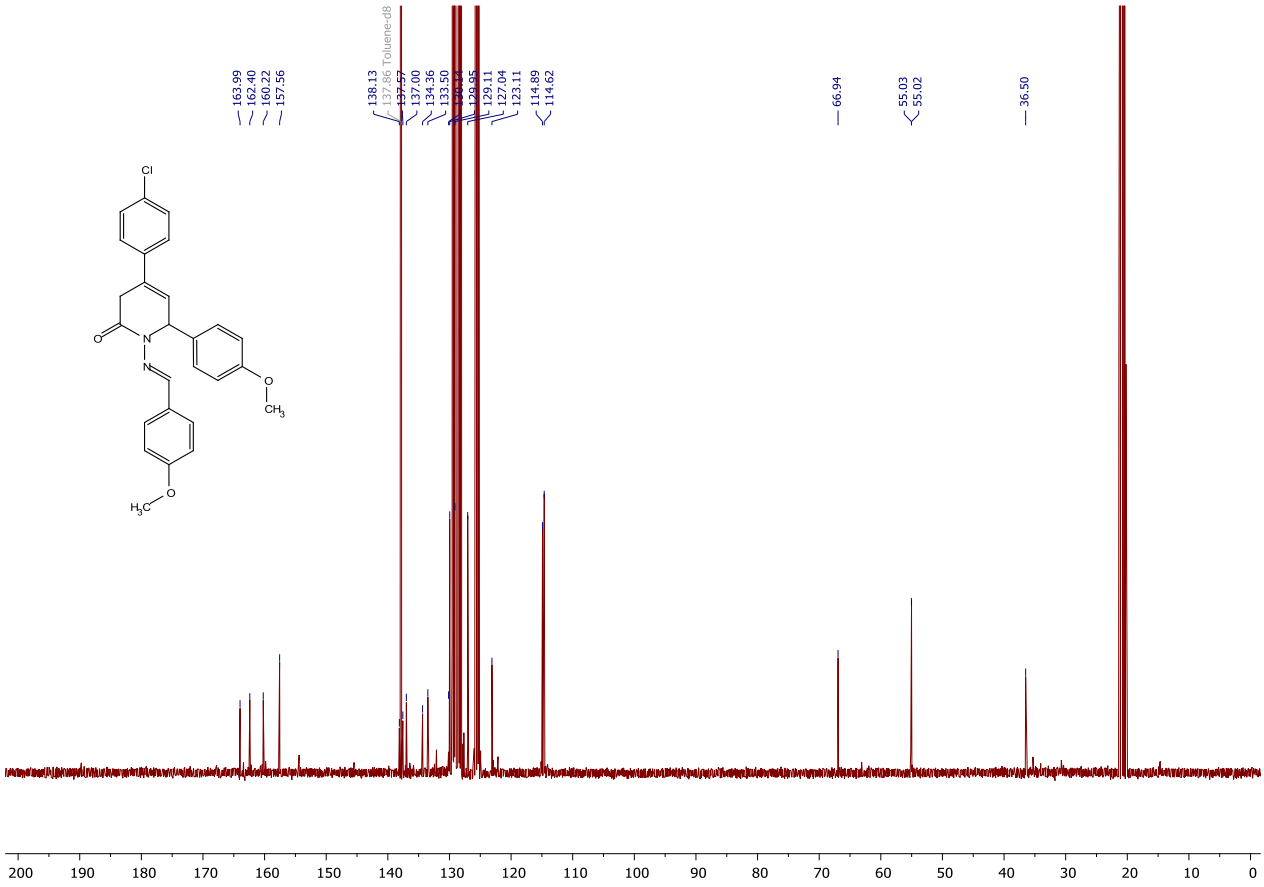
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **4f**



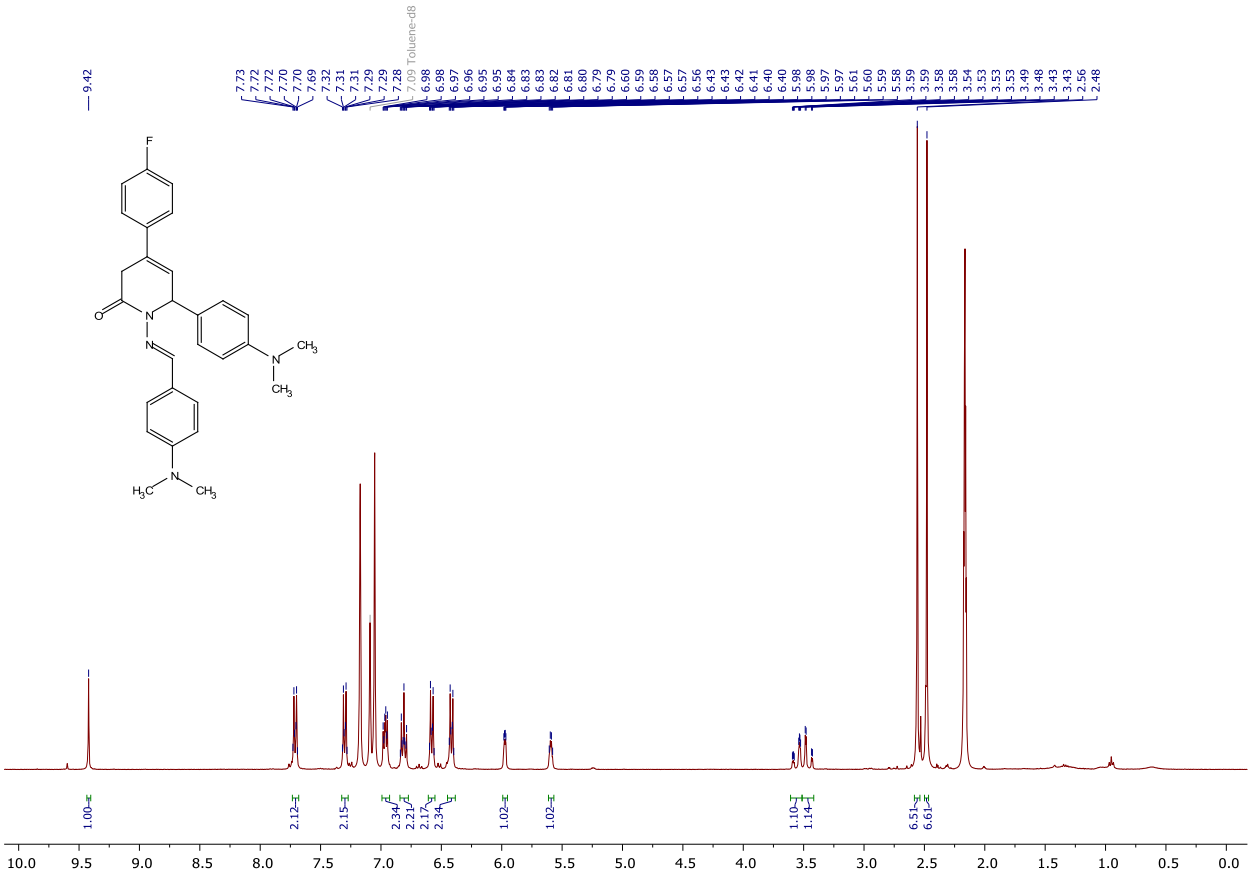


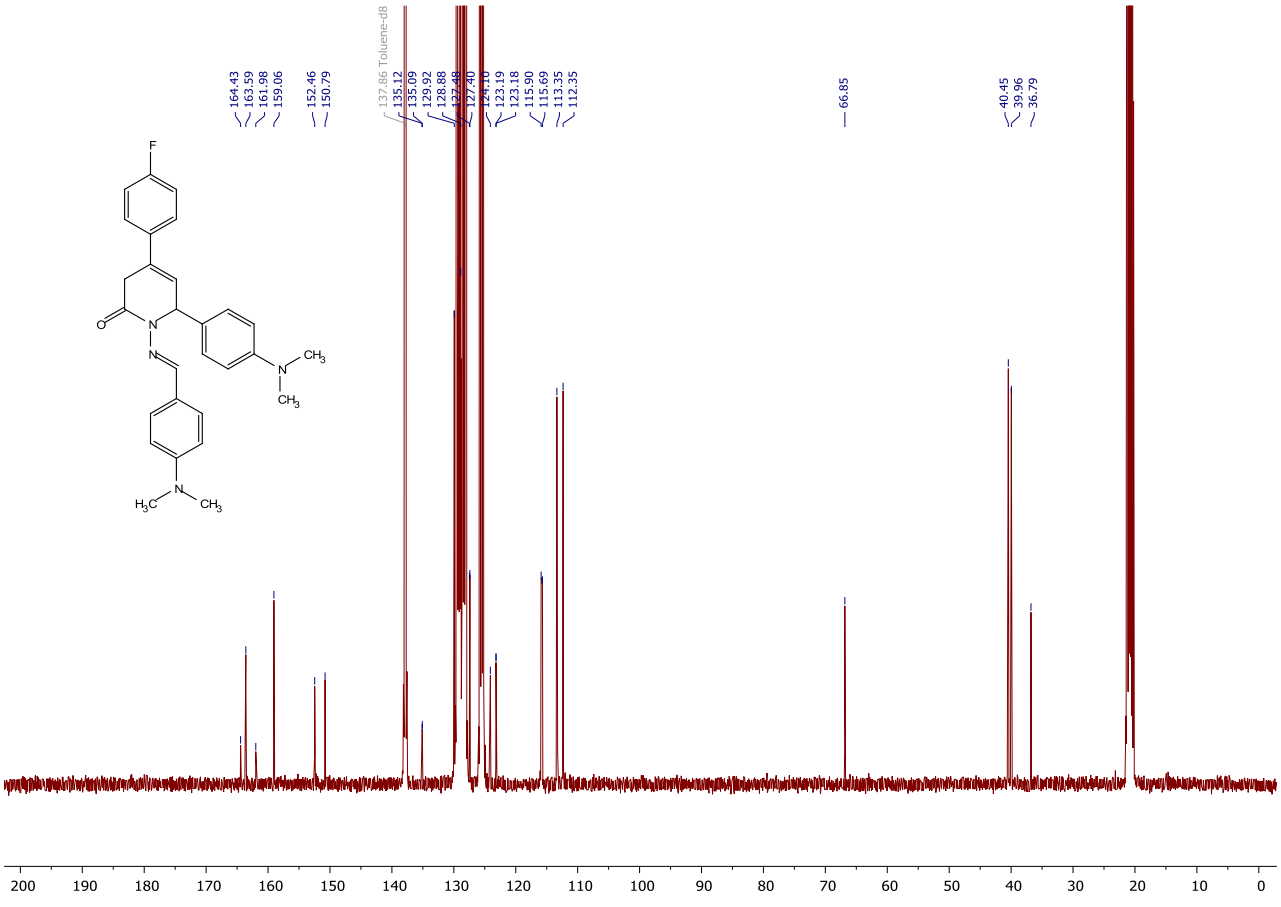
^{1}H and ^{13}C NMR spectra of compound **4g**

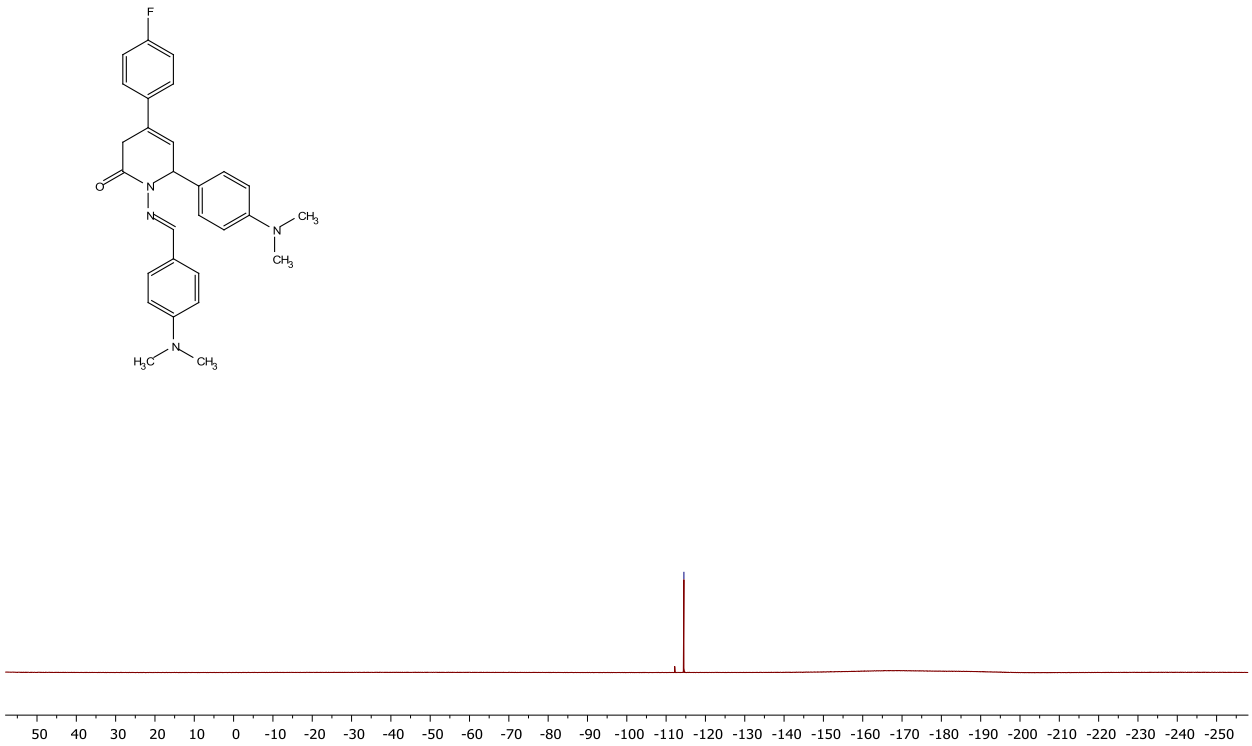




^{1}H, ^{13}C NMR and ^{19}F spectra of compound **4h**



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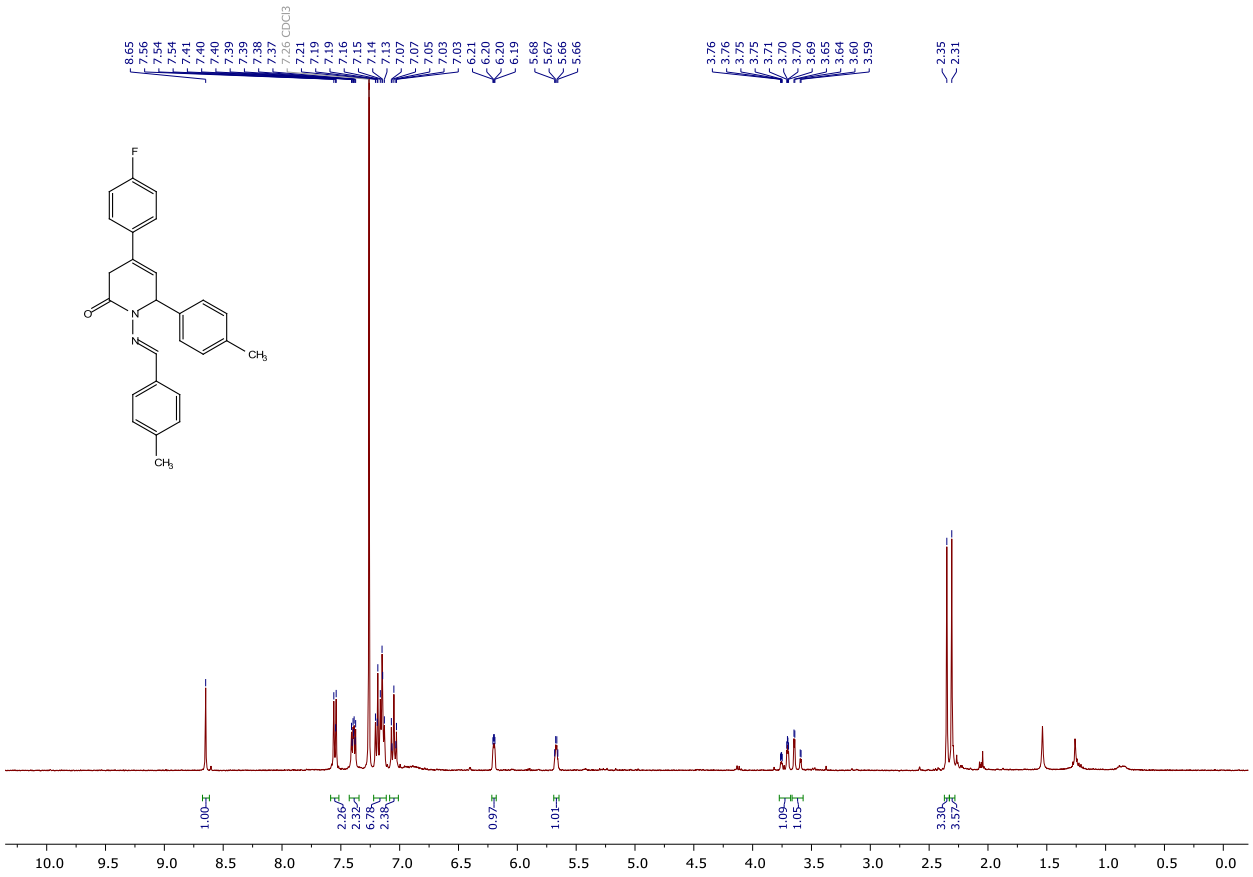
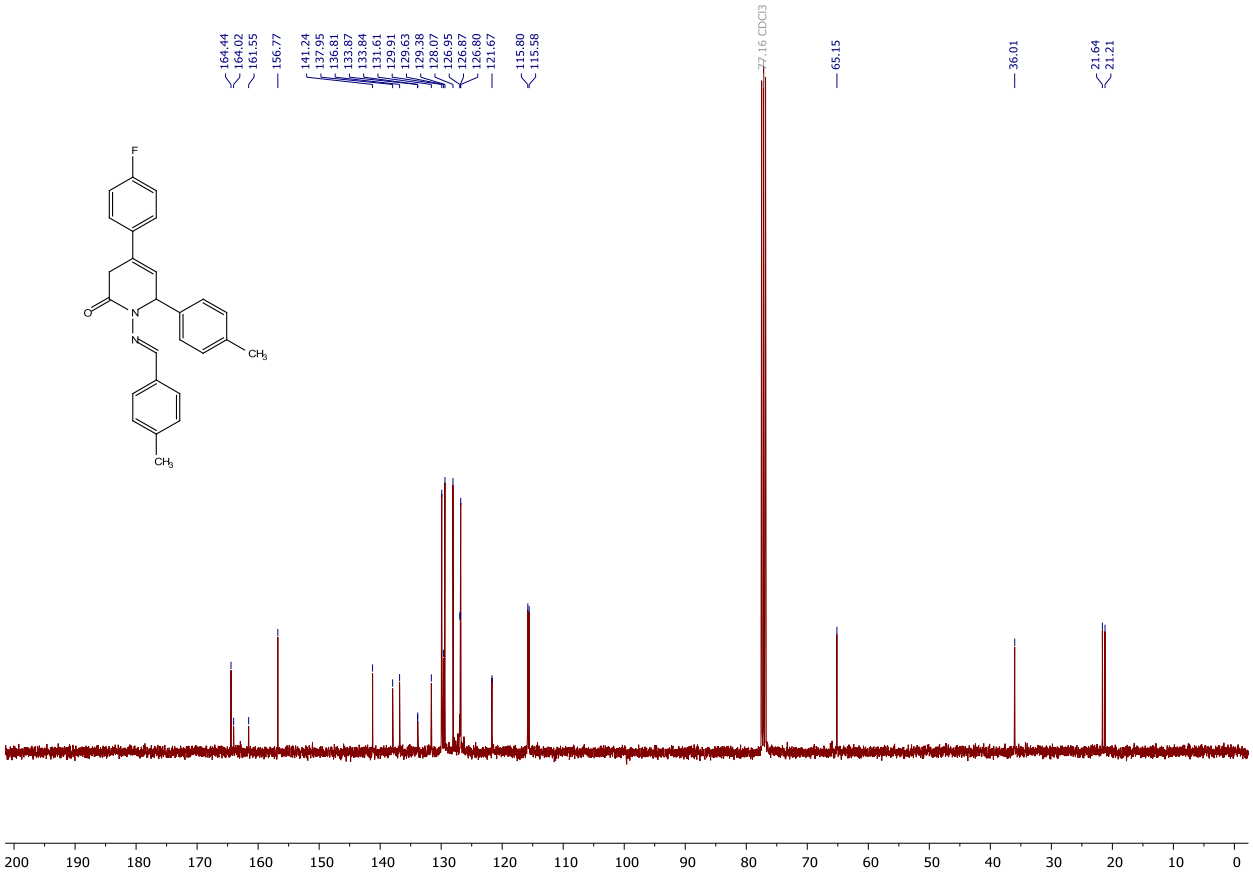
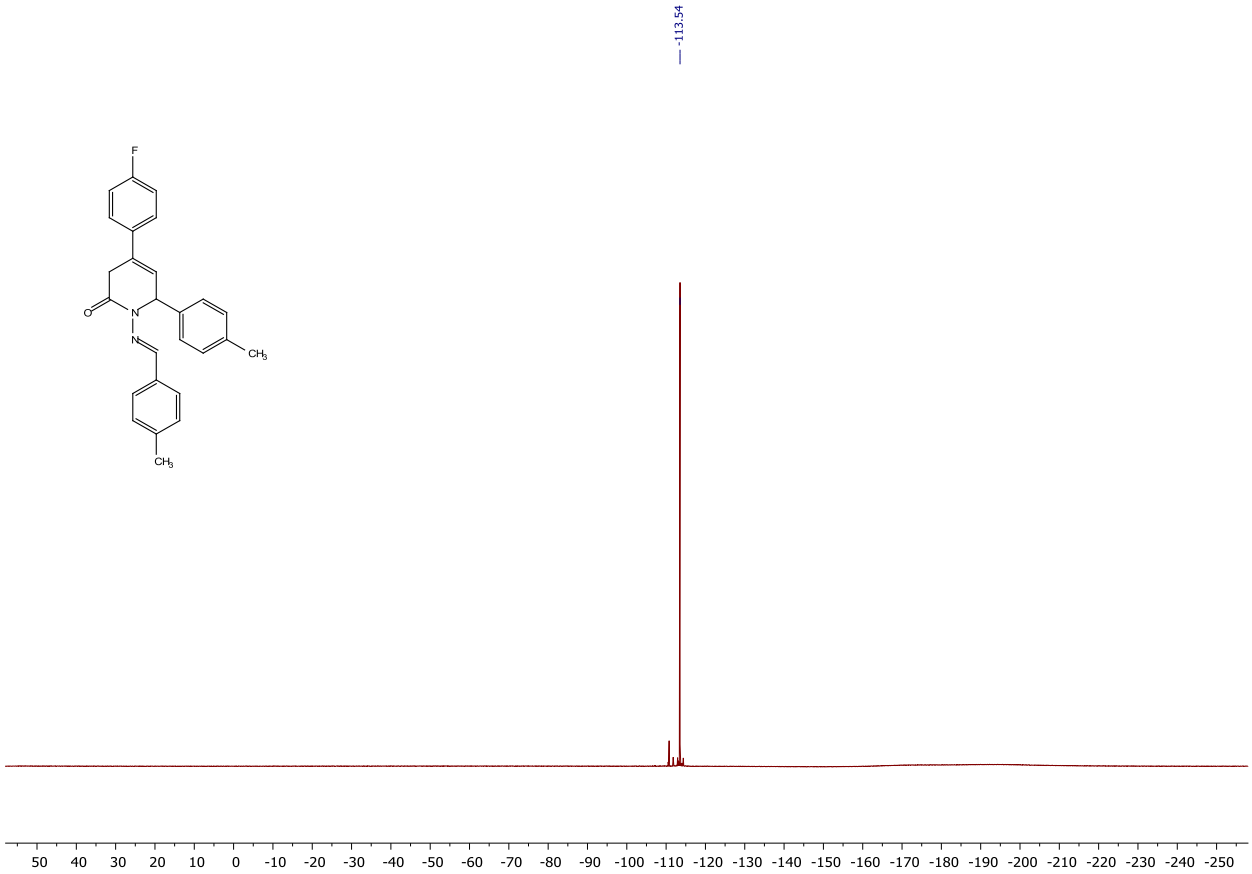
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **4i**



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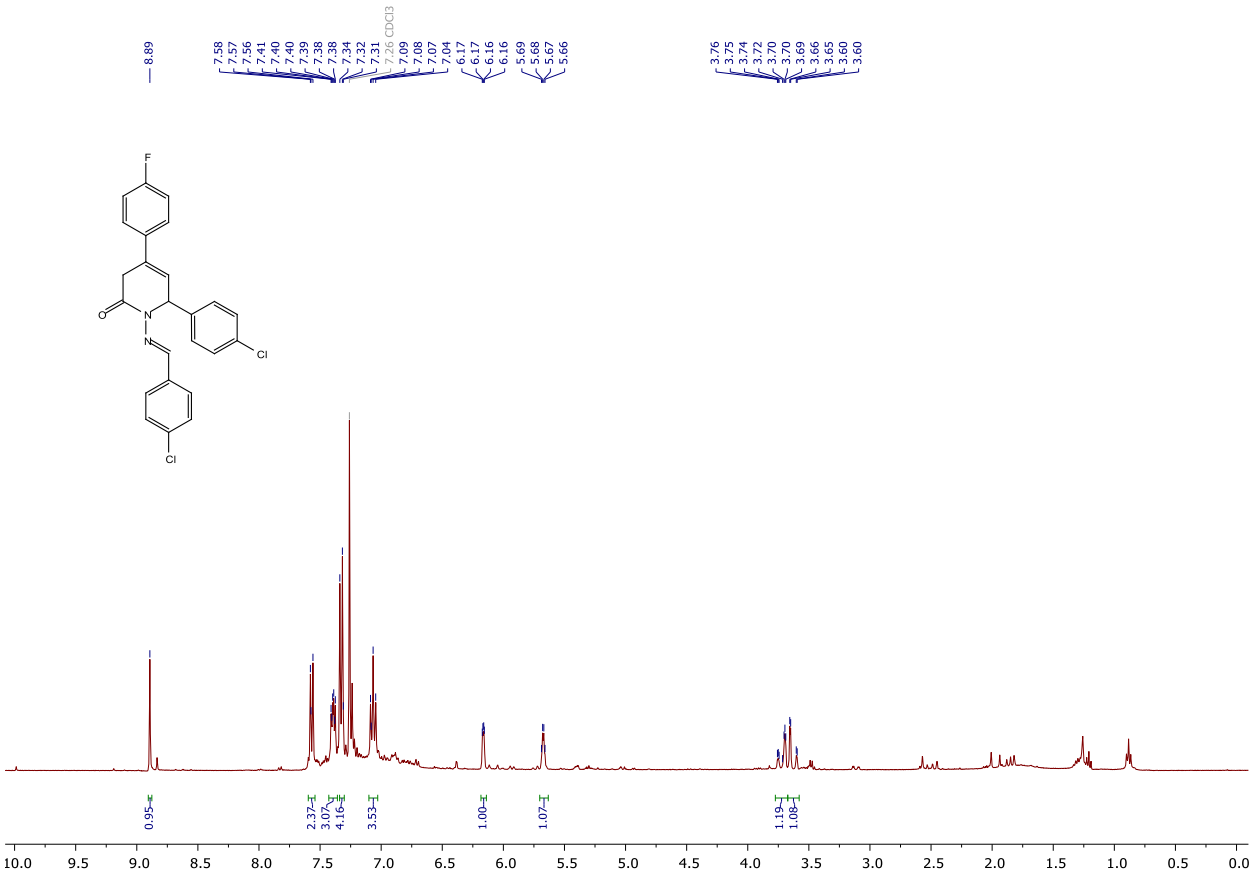
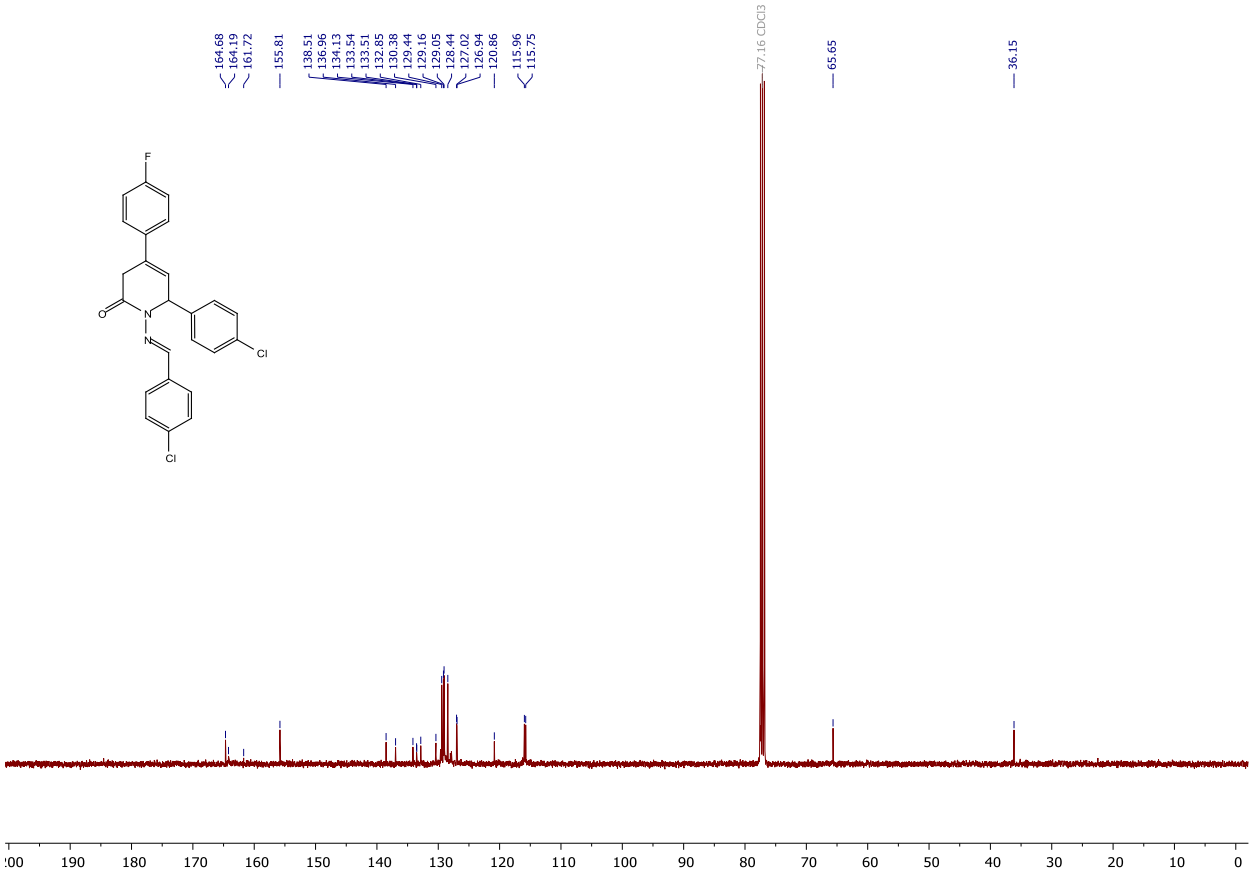
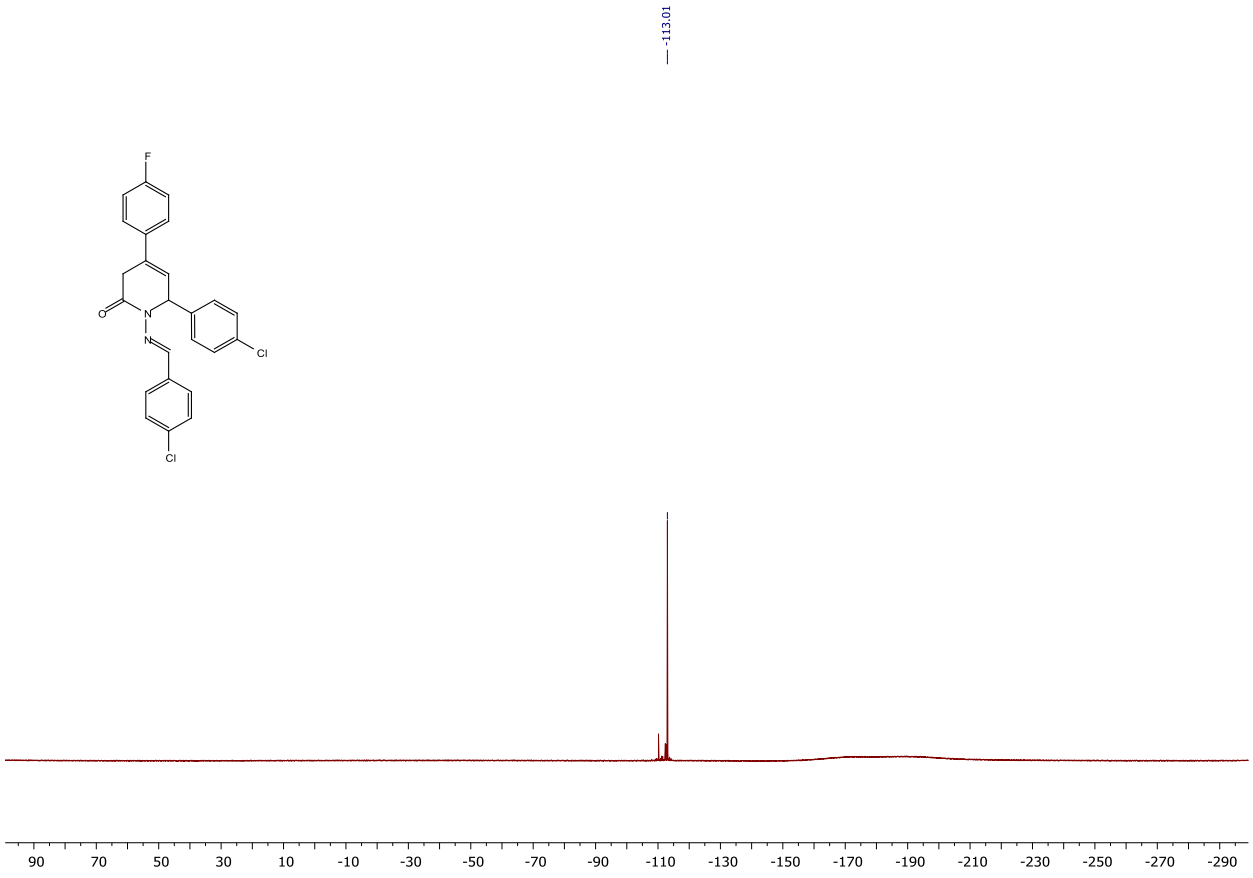
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **4j**



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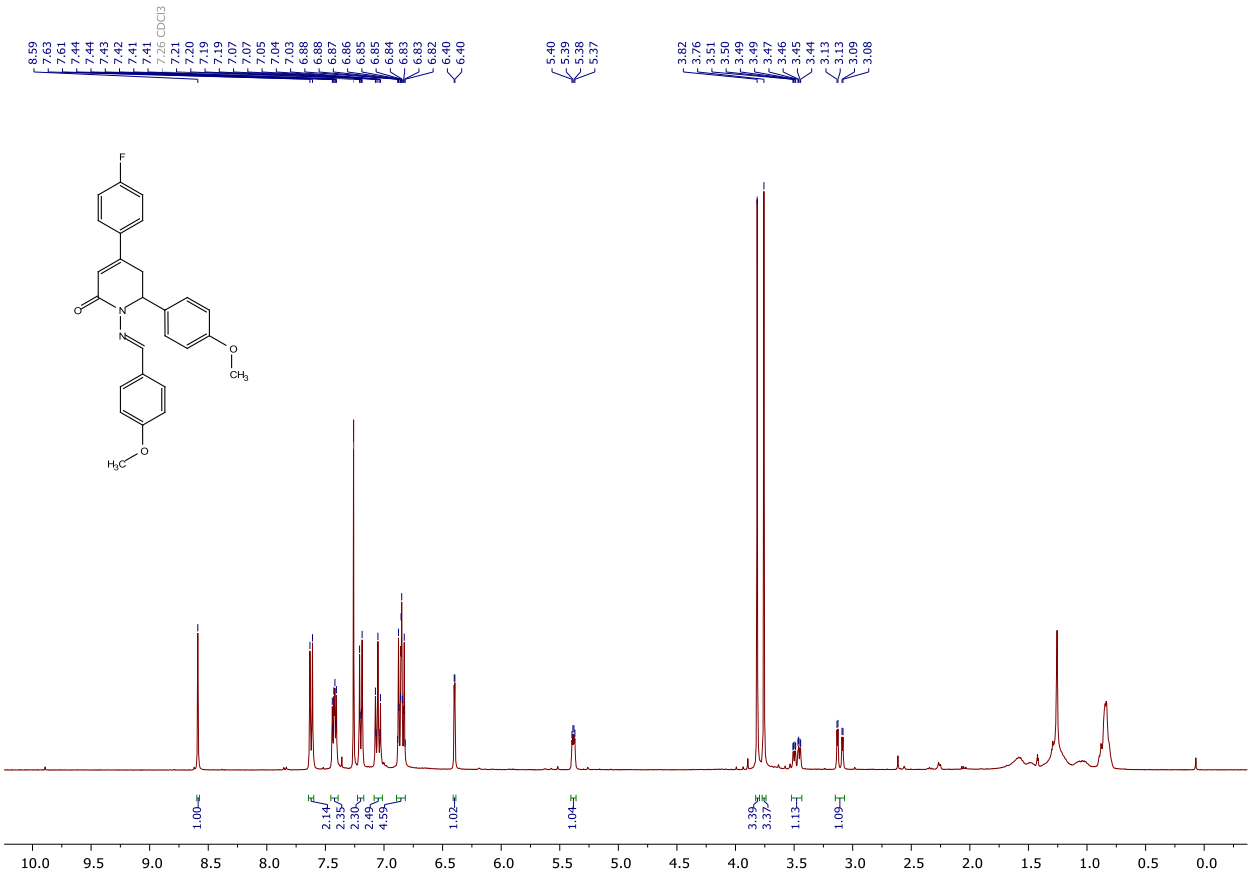
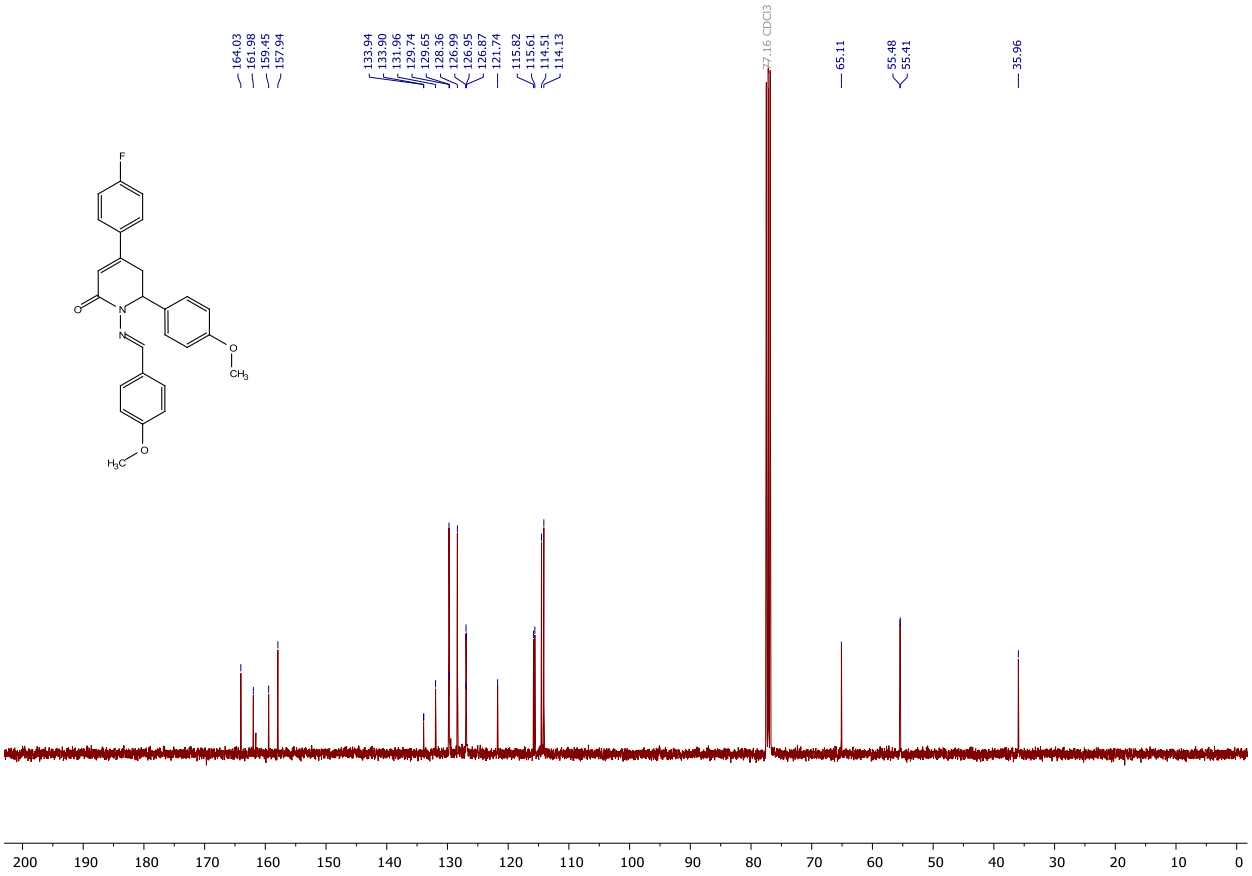
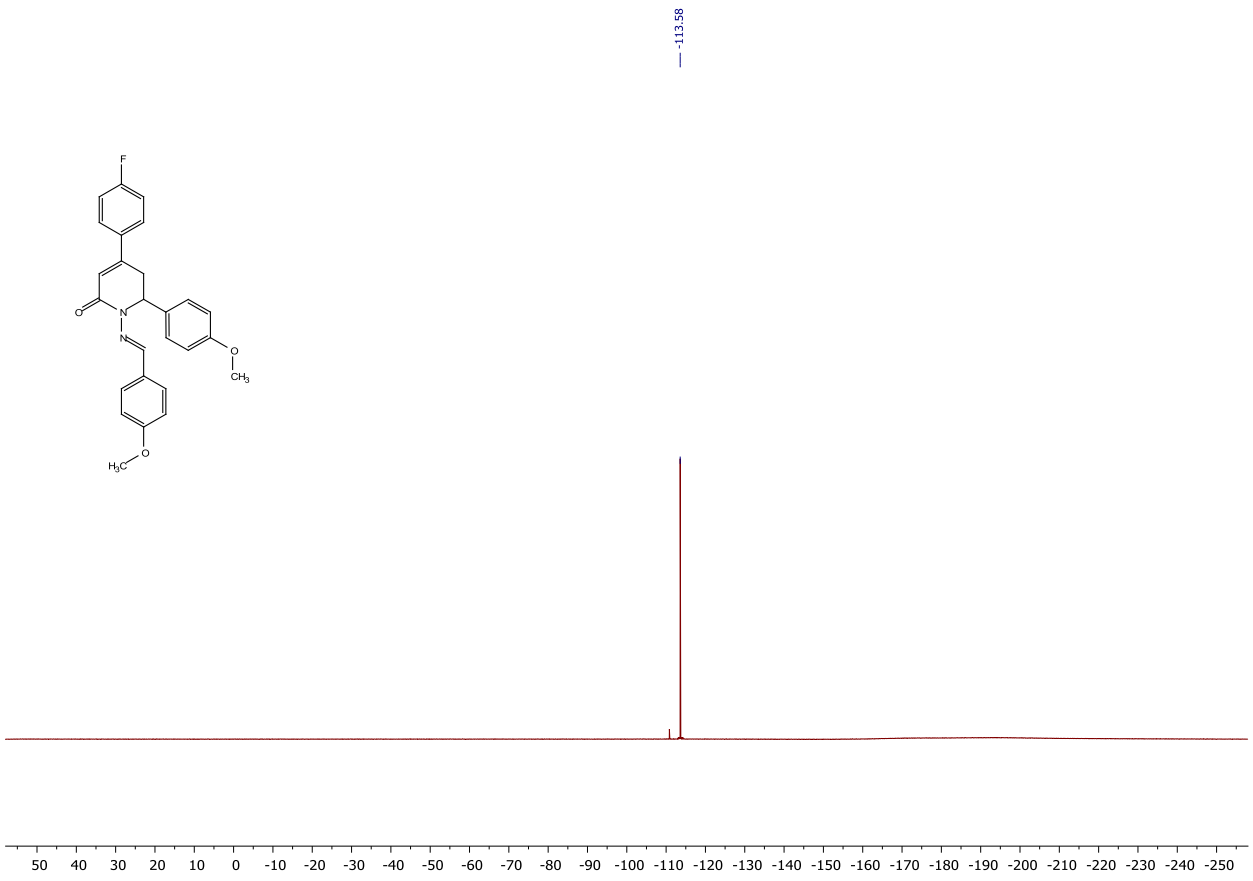
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **4aa**



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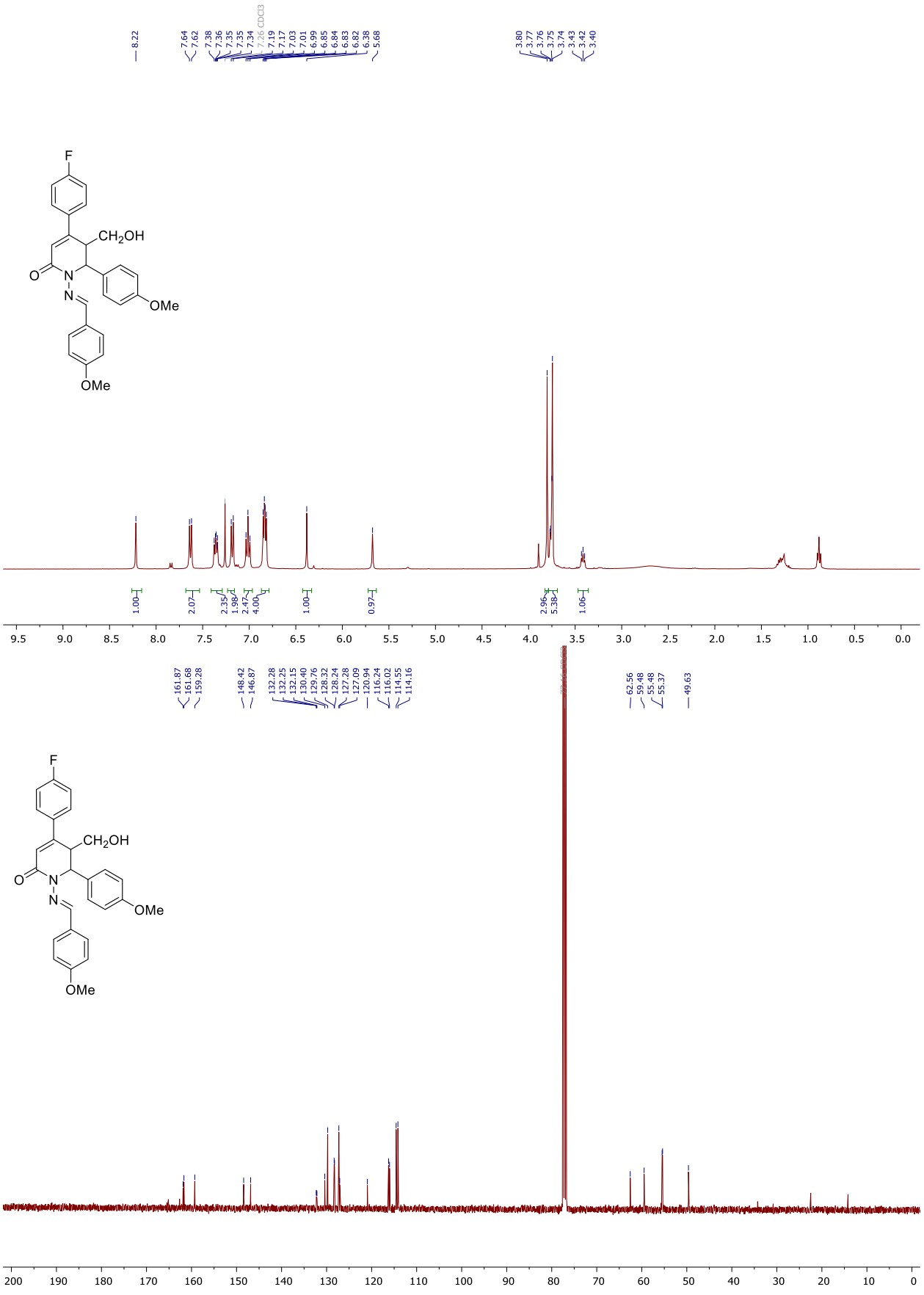
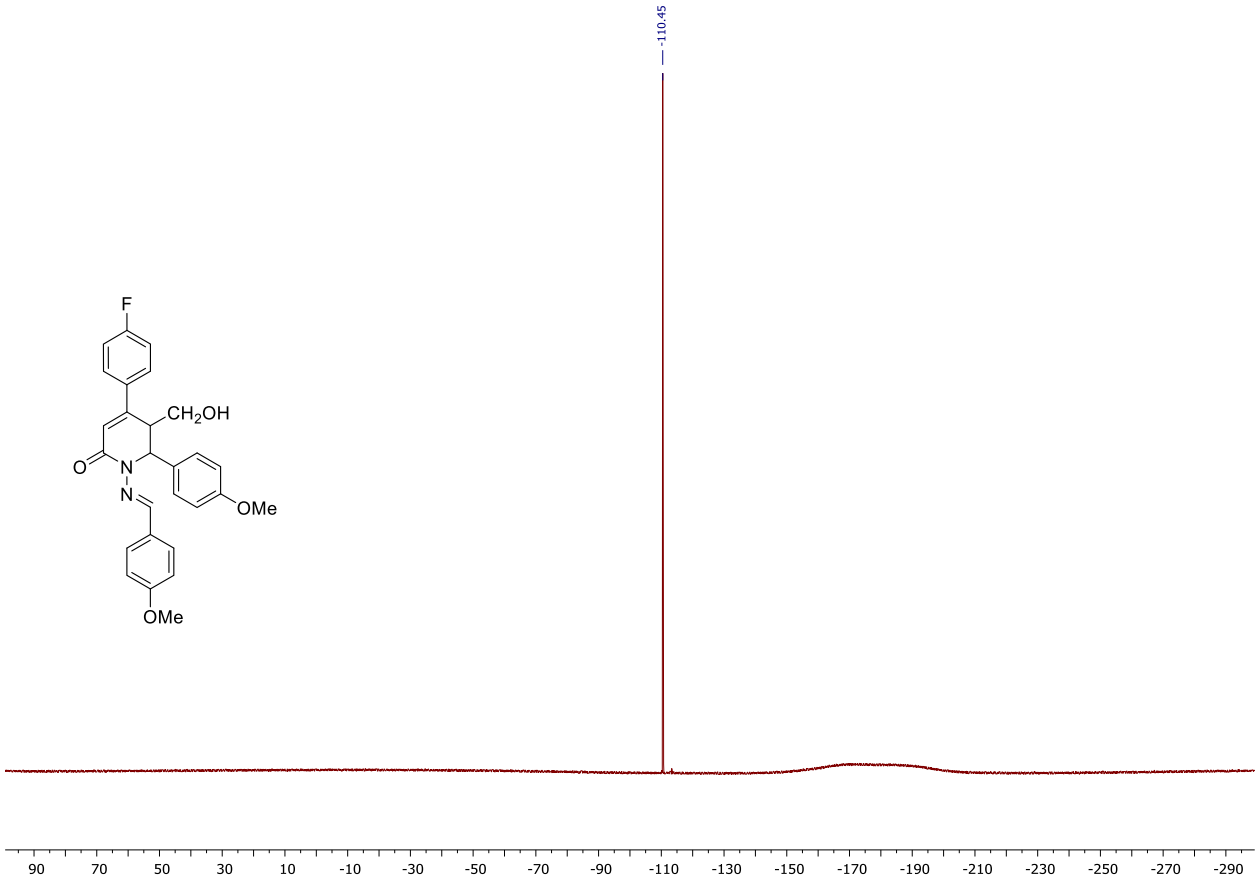
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **5**

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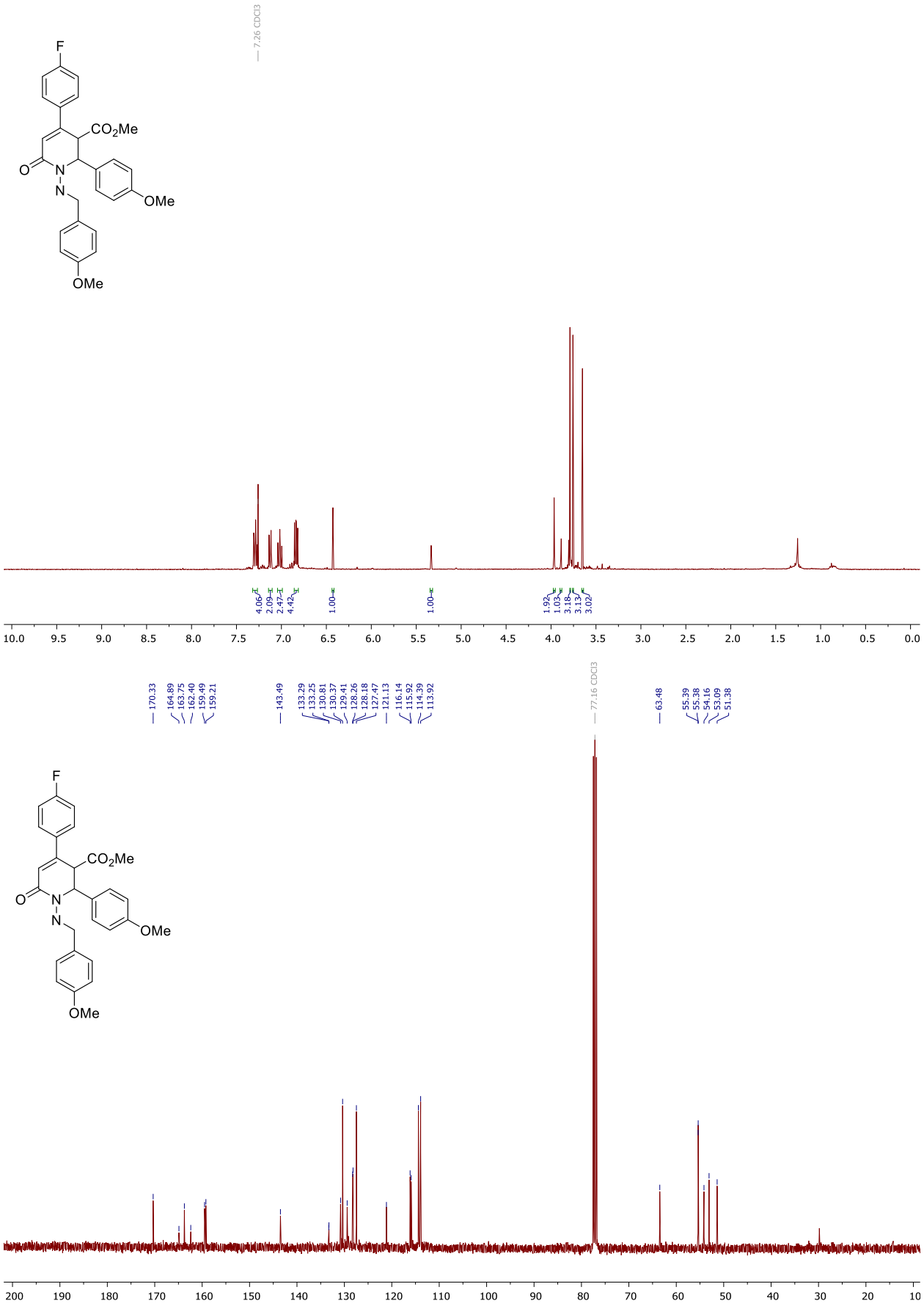
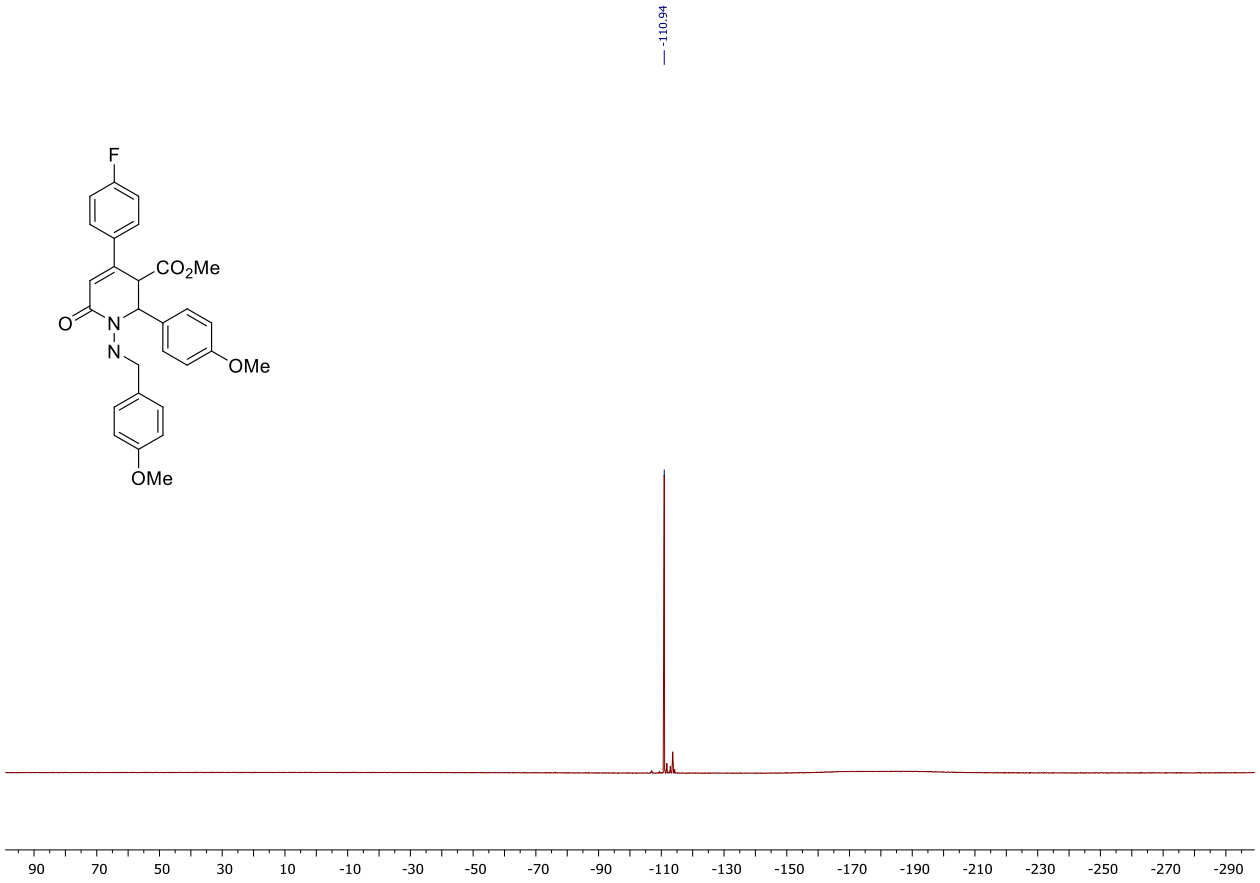
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **6**

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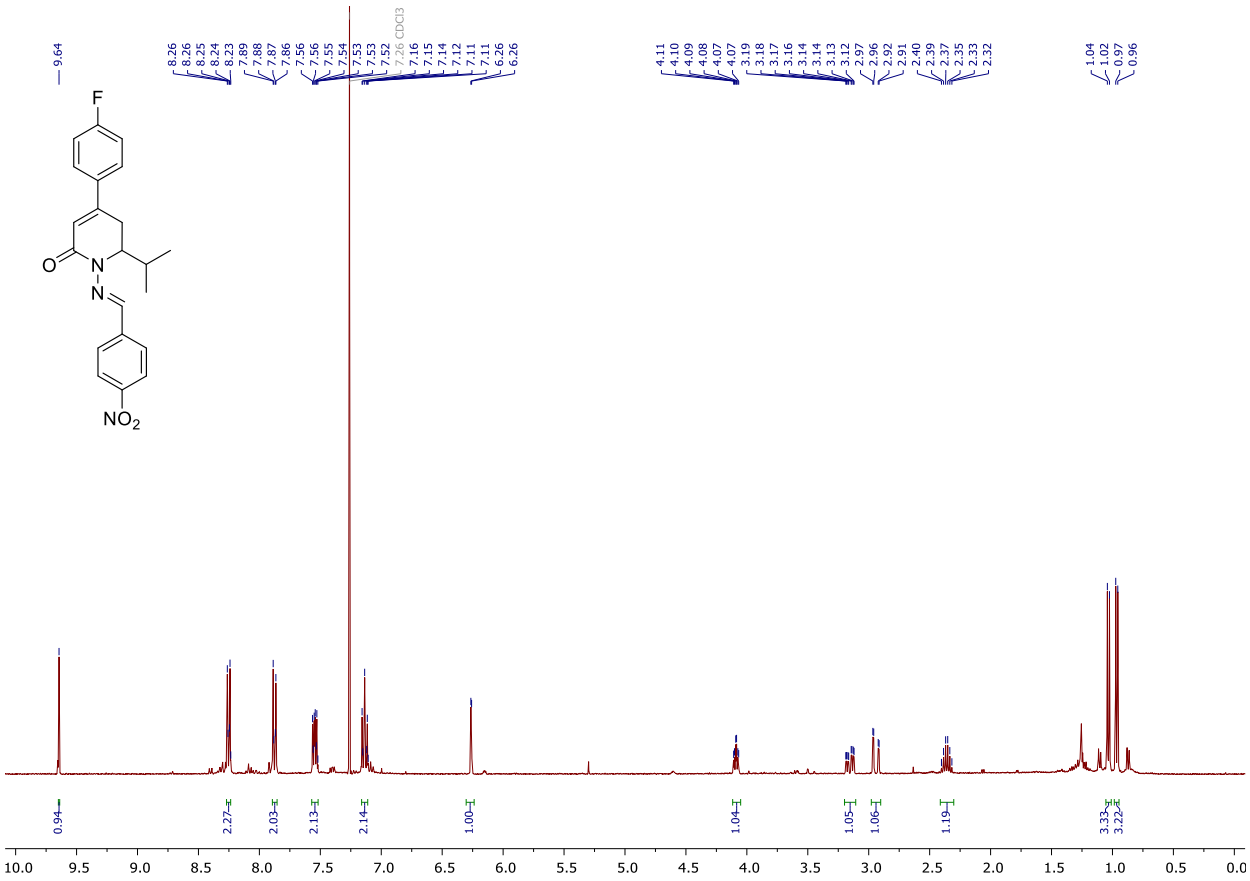
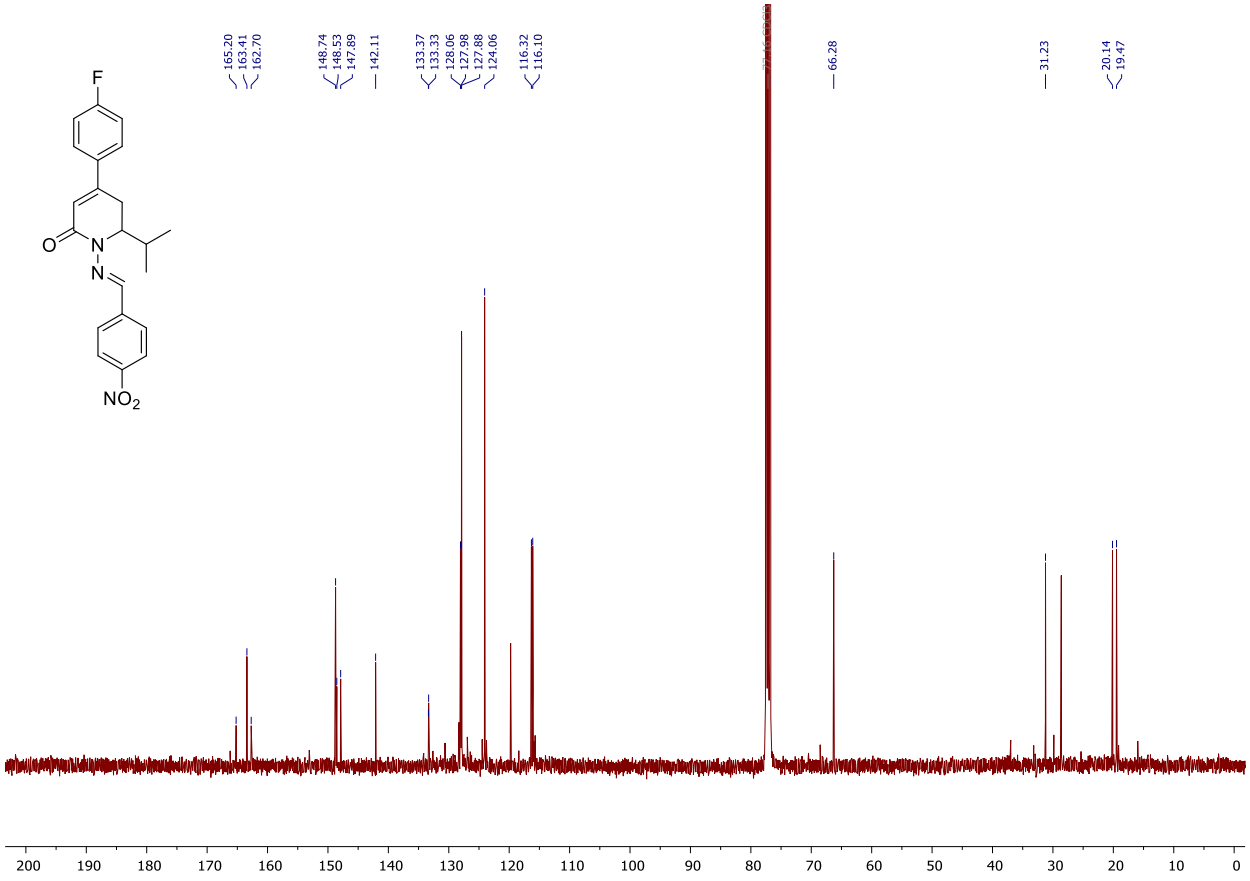
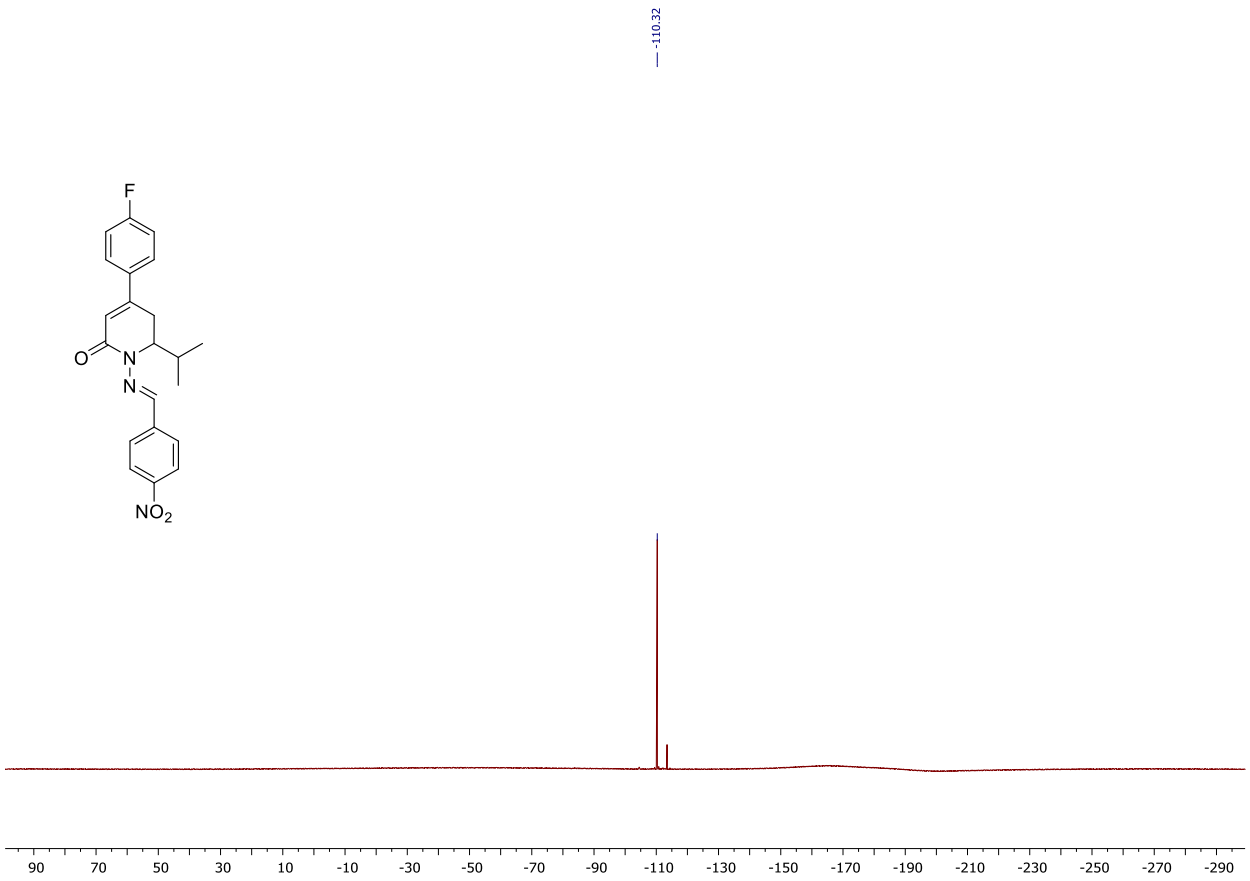
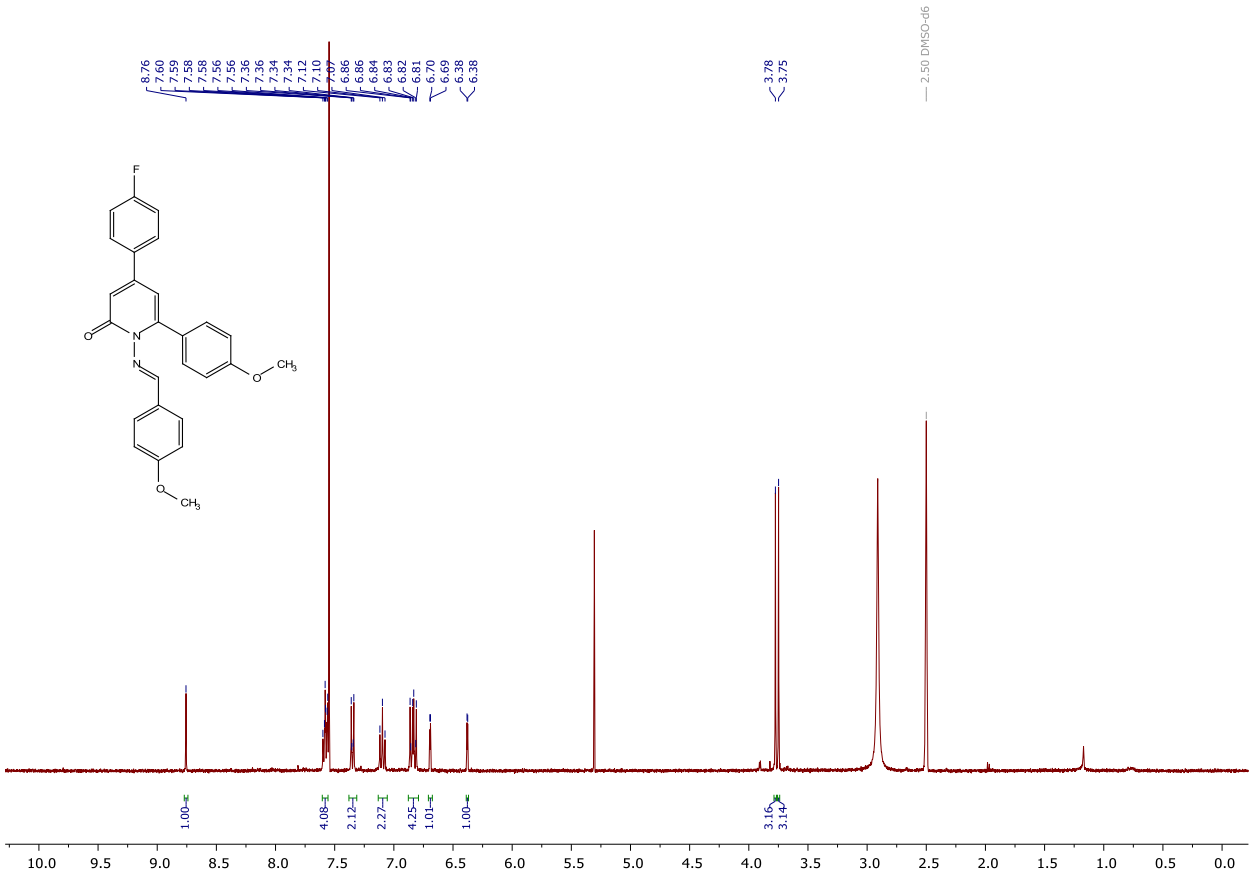
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **7**

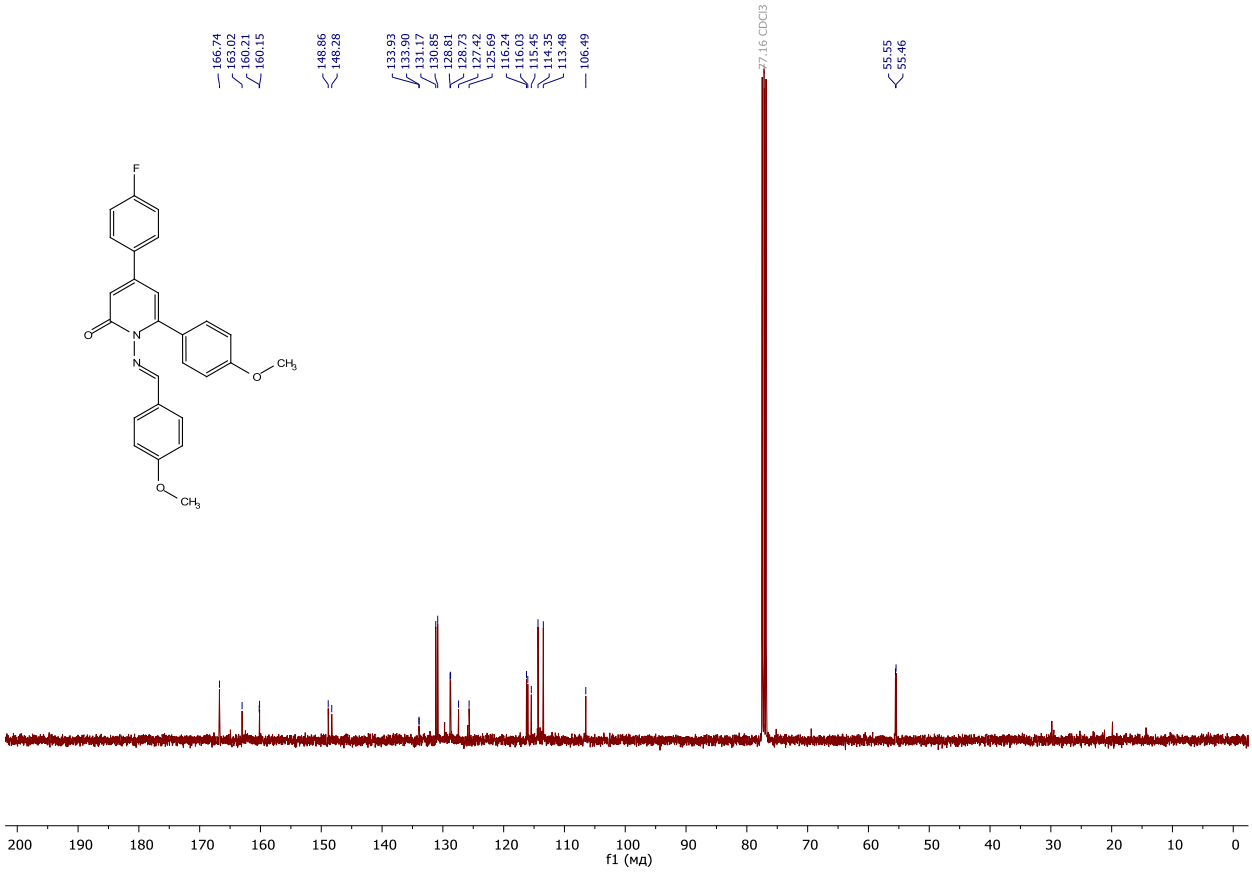


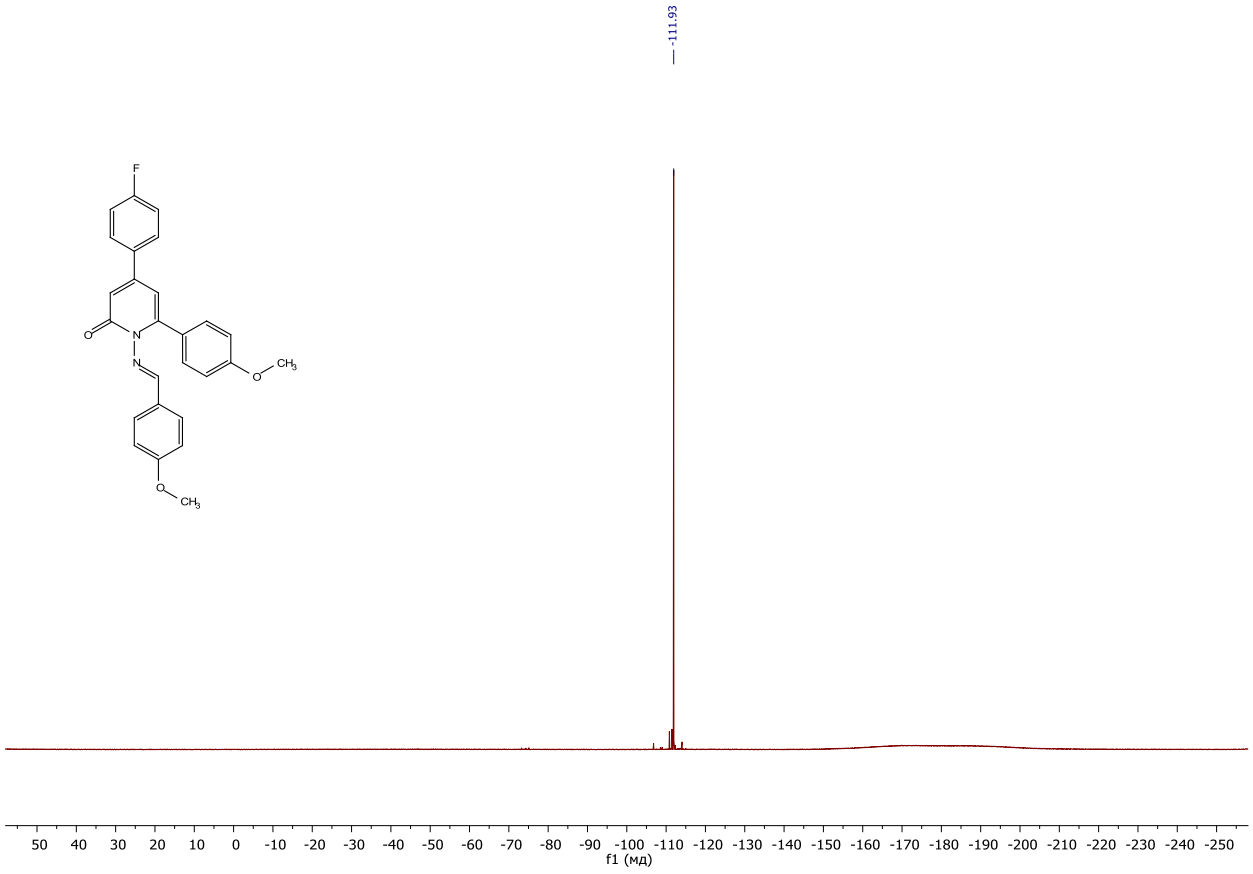



-110.32
F
O
N
N
NO2
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
-150
-170
-190
-210
-230
-250
-270
-290

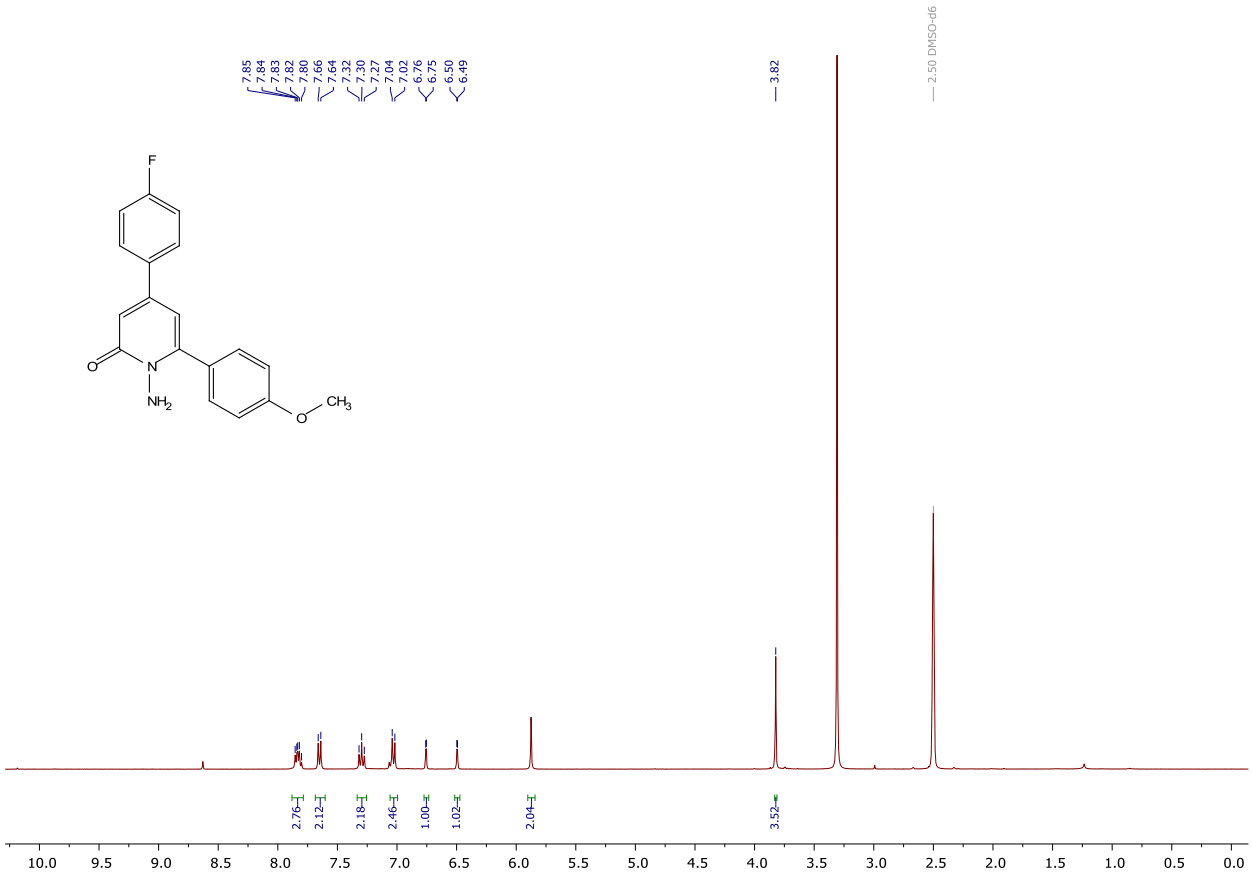
^{1}H, ^{13}C NMR and ^{19}F spectra of compound **8**

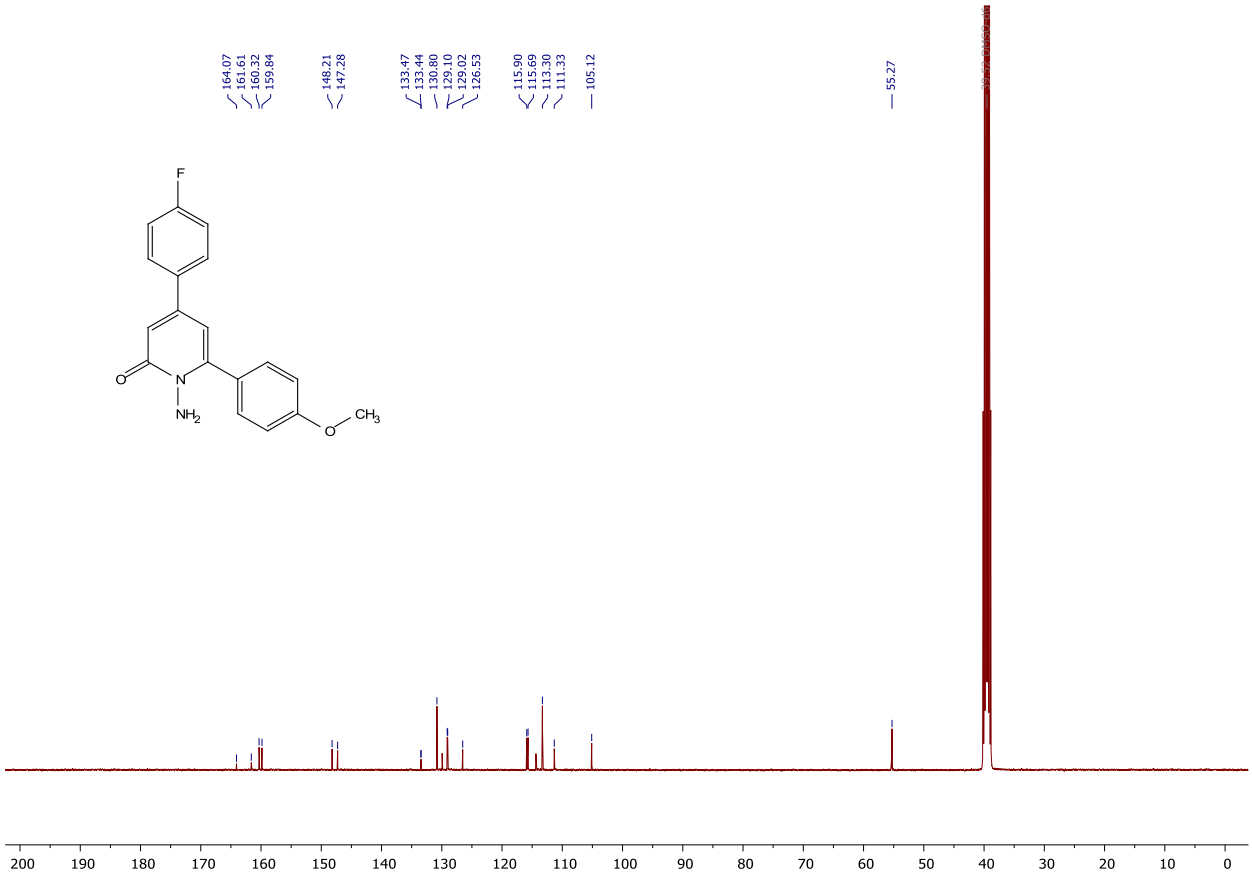


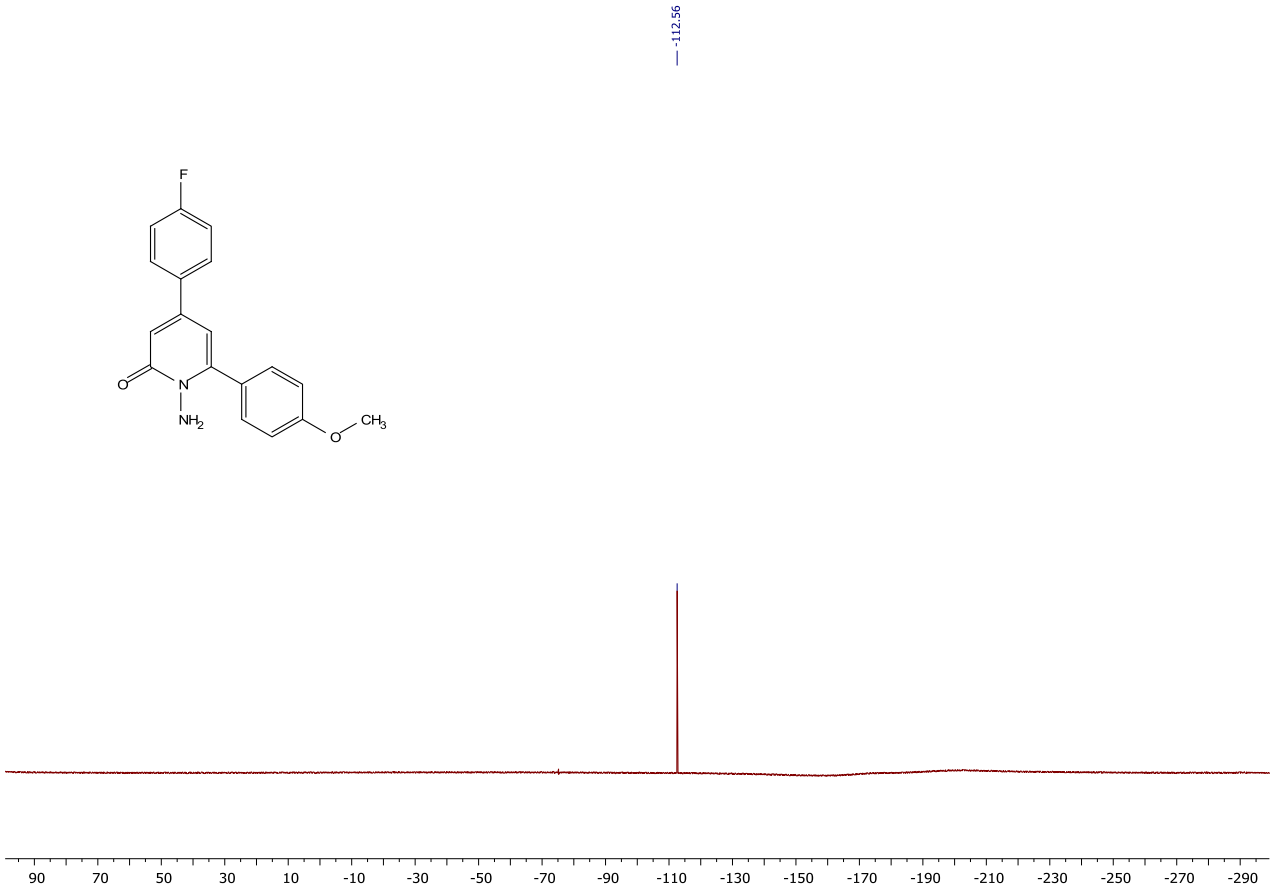



-111.93
F
O
N
N
O
CH3
O
CH3
50 40 30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230 -240 -250
f1 (мд)

^{1}H, ^{13}C NMR and ^{19}F spectra of compound **9**






-112.56
F
O
N
NH2
O
CH3
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
-150
-170
-190
-210
-230
-250
-270
-290