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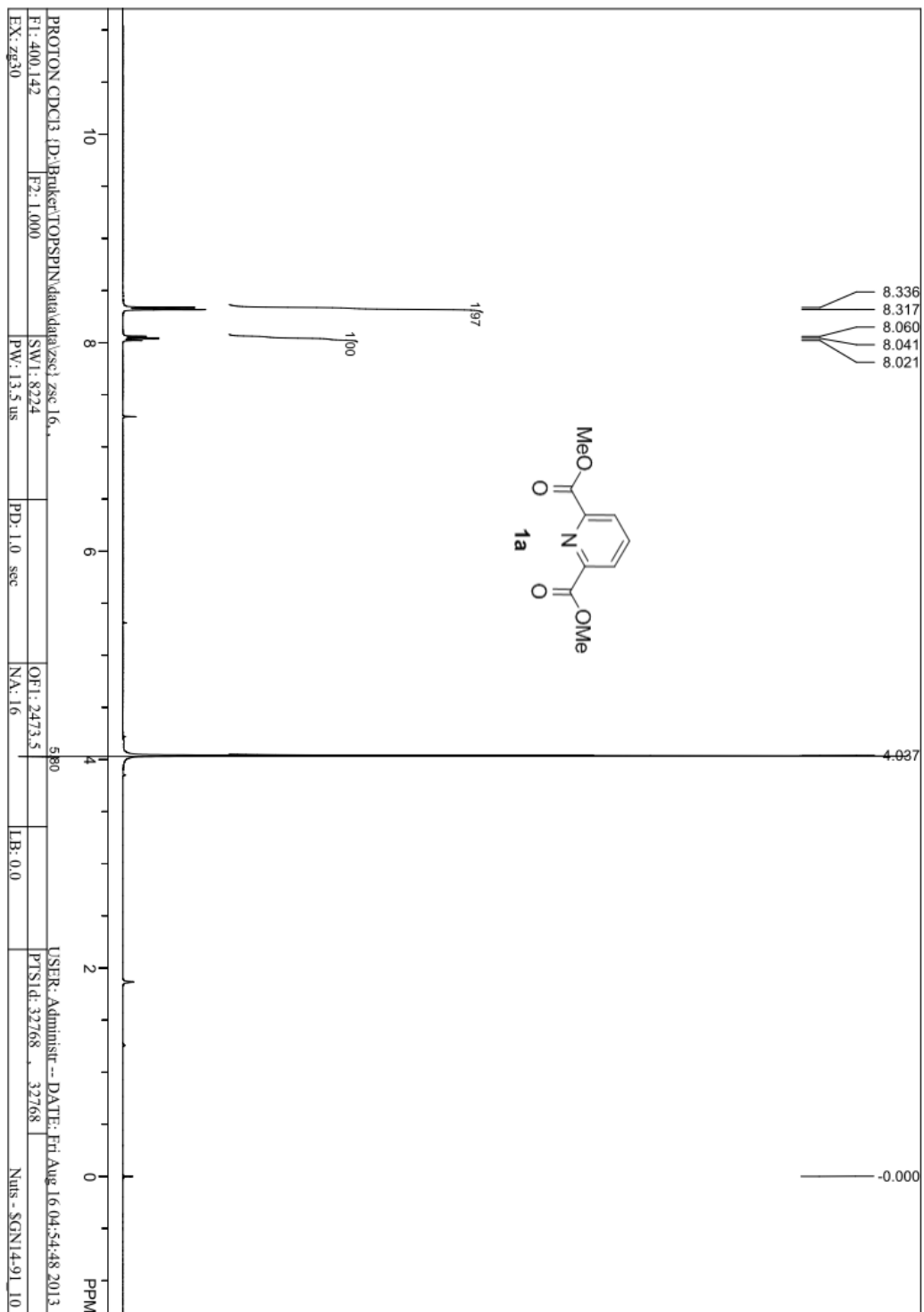
**Enantioselective synthesis of monofluorinated allylic compounds:
Pd-catalyzed asymmetric allylations of dimethyl 2-fluoromalonate
using new *N*-sulfinyl-based ligands**

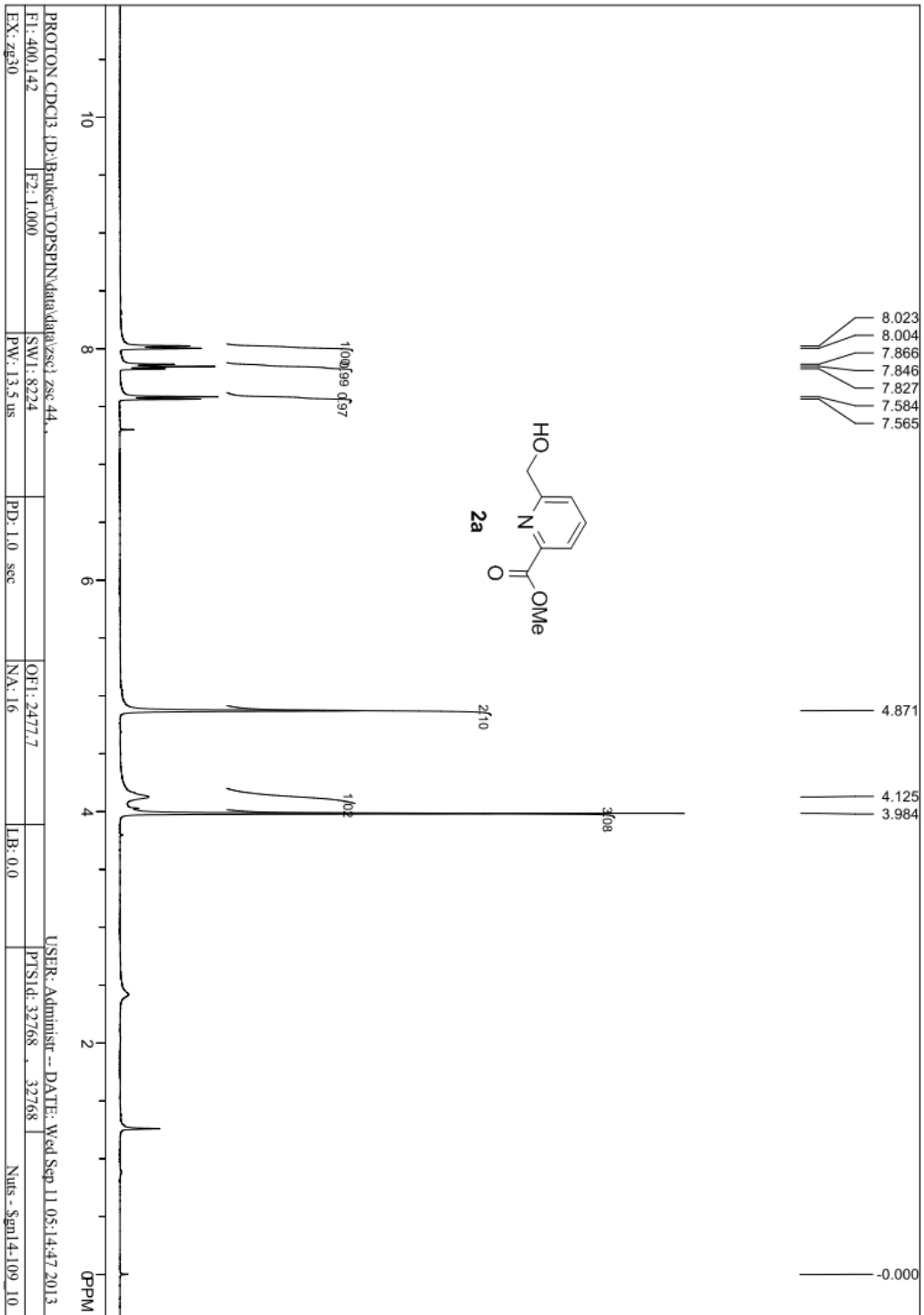
Ning Gao, Xiao-Ming Zhao*, Cheng-Si Cai and Jue-Wang Cai

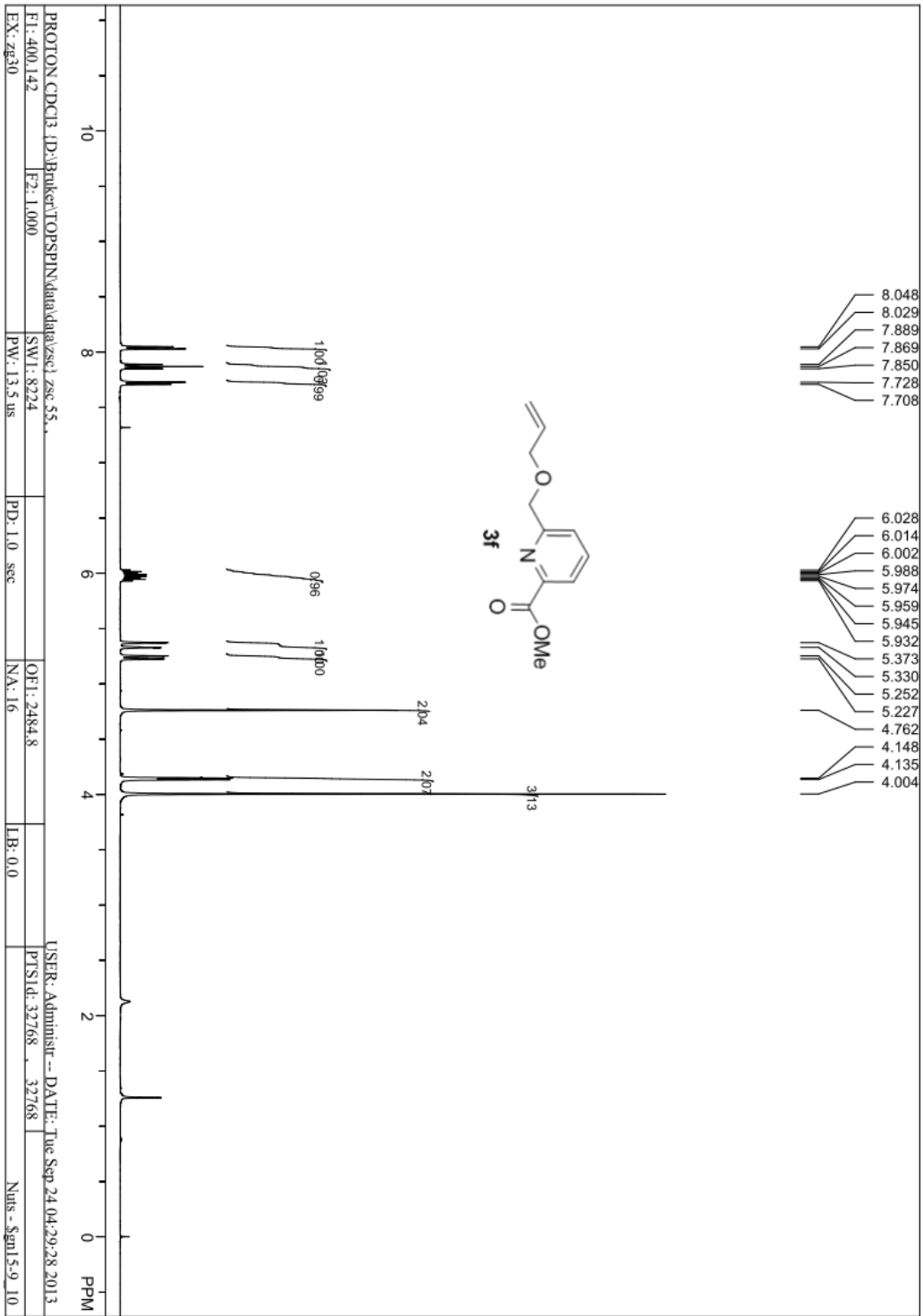
Shanghai Key Lab of Chemical Assessment and Sustainability, Department of Chemistry, Tongji
University, 1239 Siping Road, 200092 Shanghai, P.R. China.

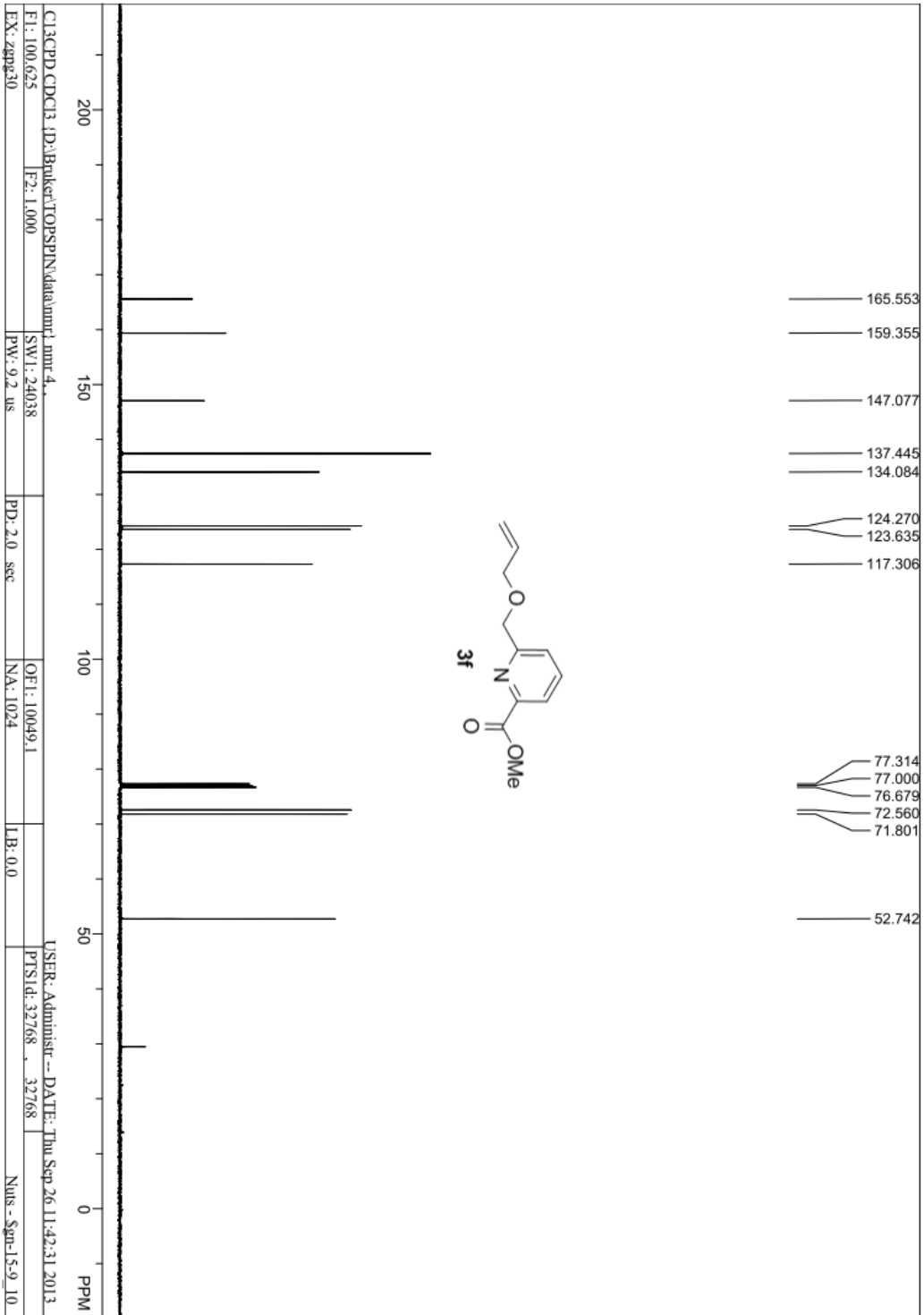
E-mail: xmzhao08@mail.tongji.edu.cn

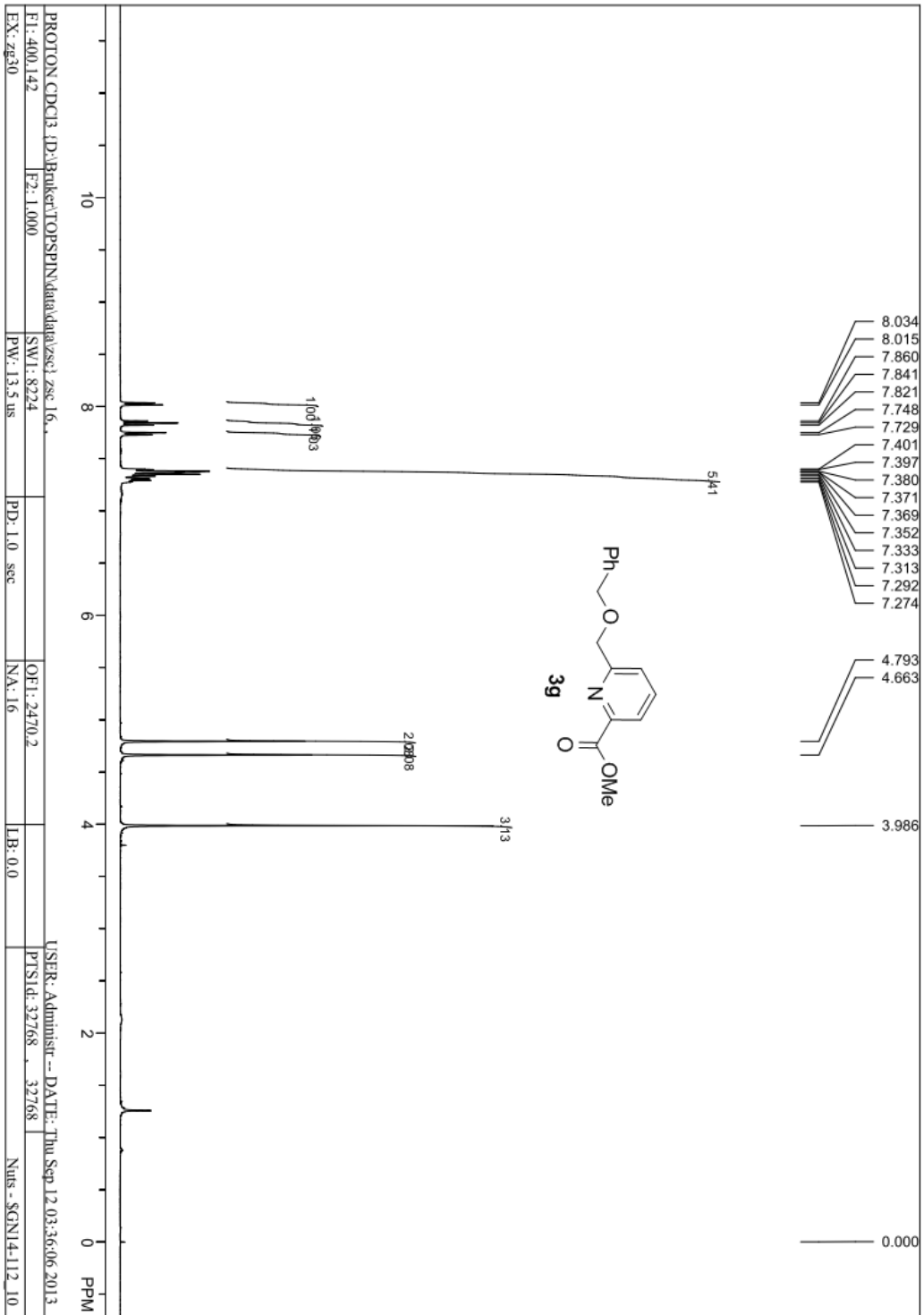
¹H, ¹⁹F, ¹³C, ³¹P NMR Data

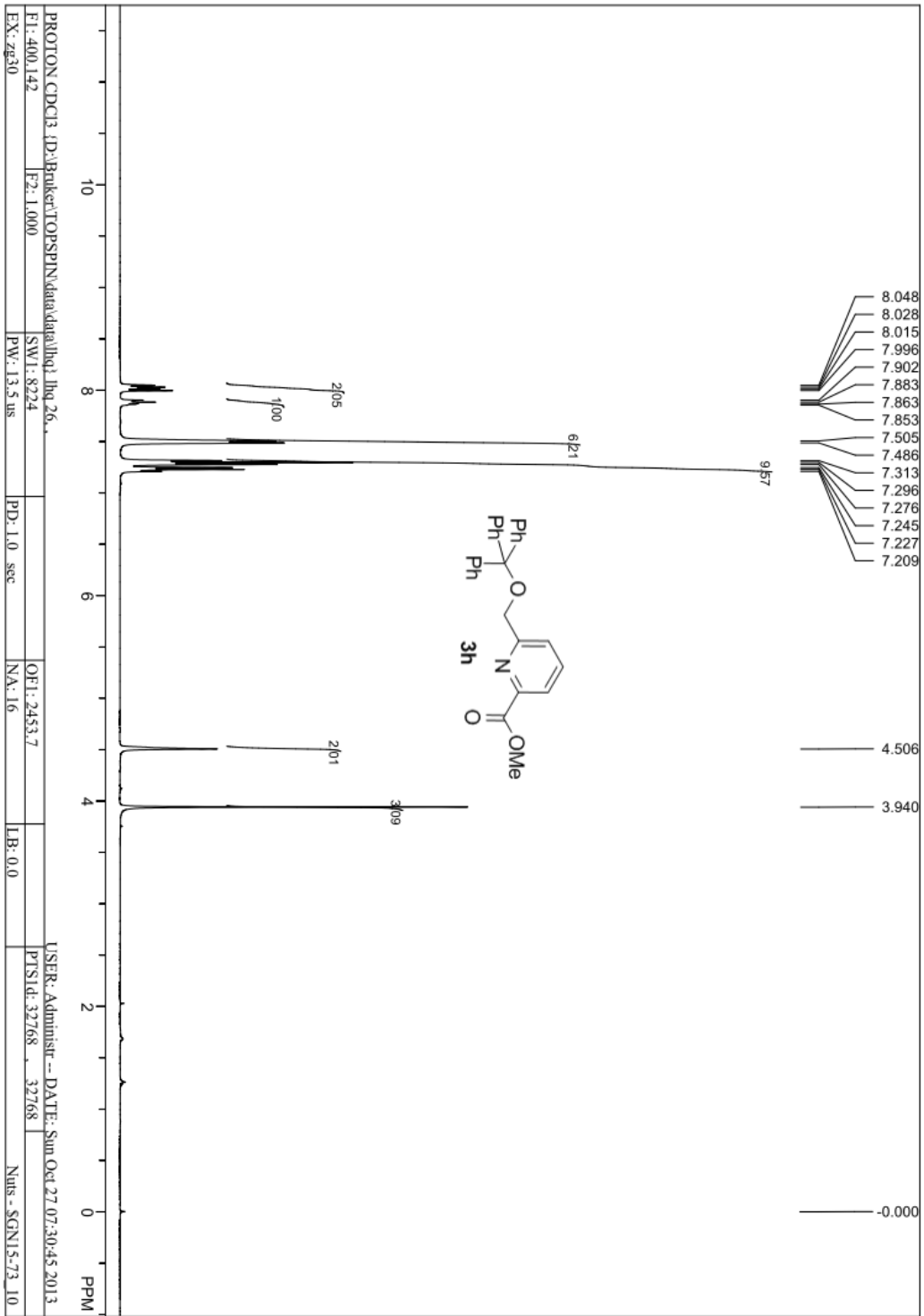


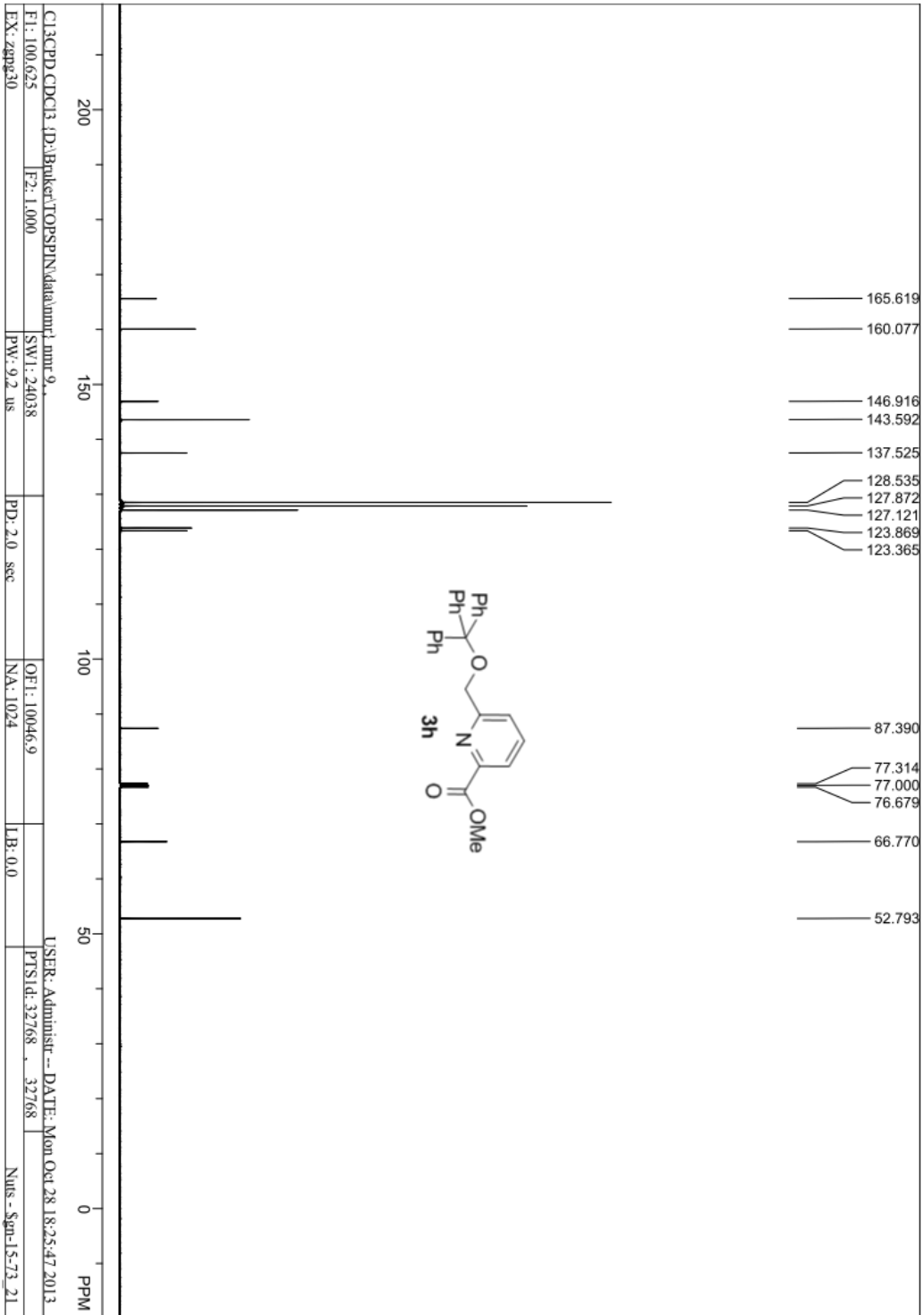


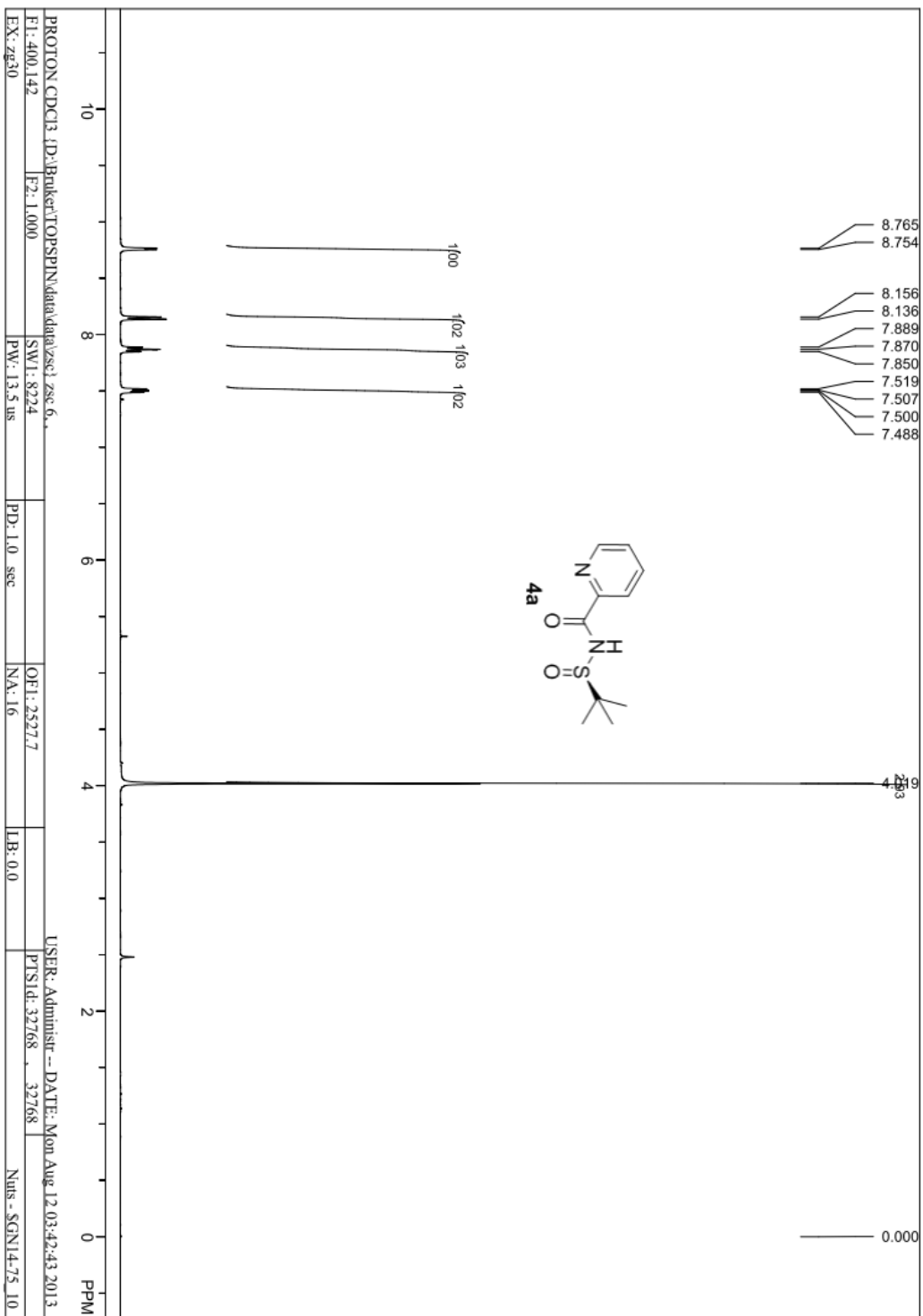


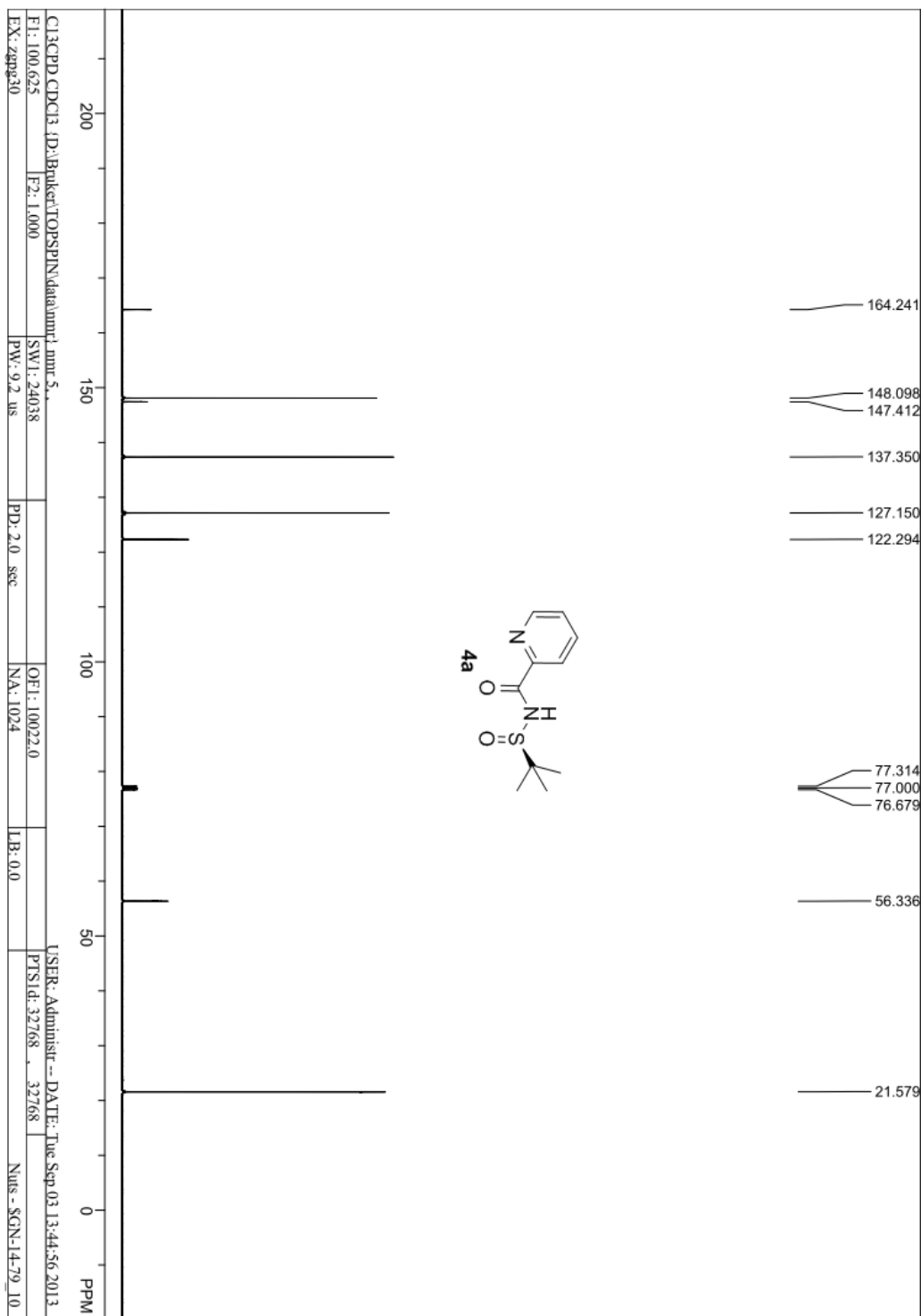


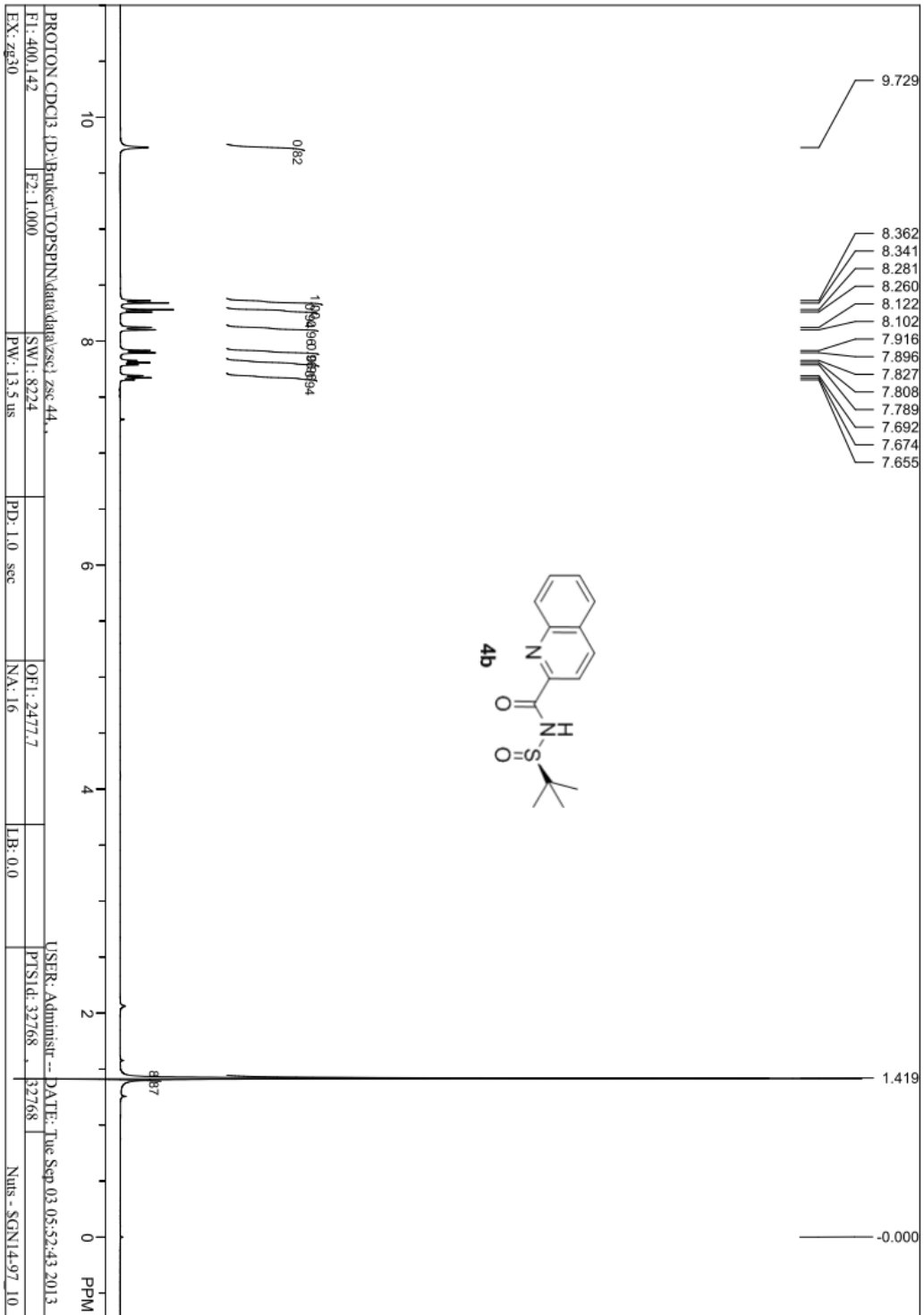


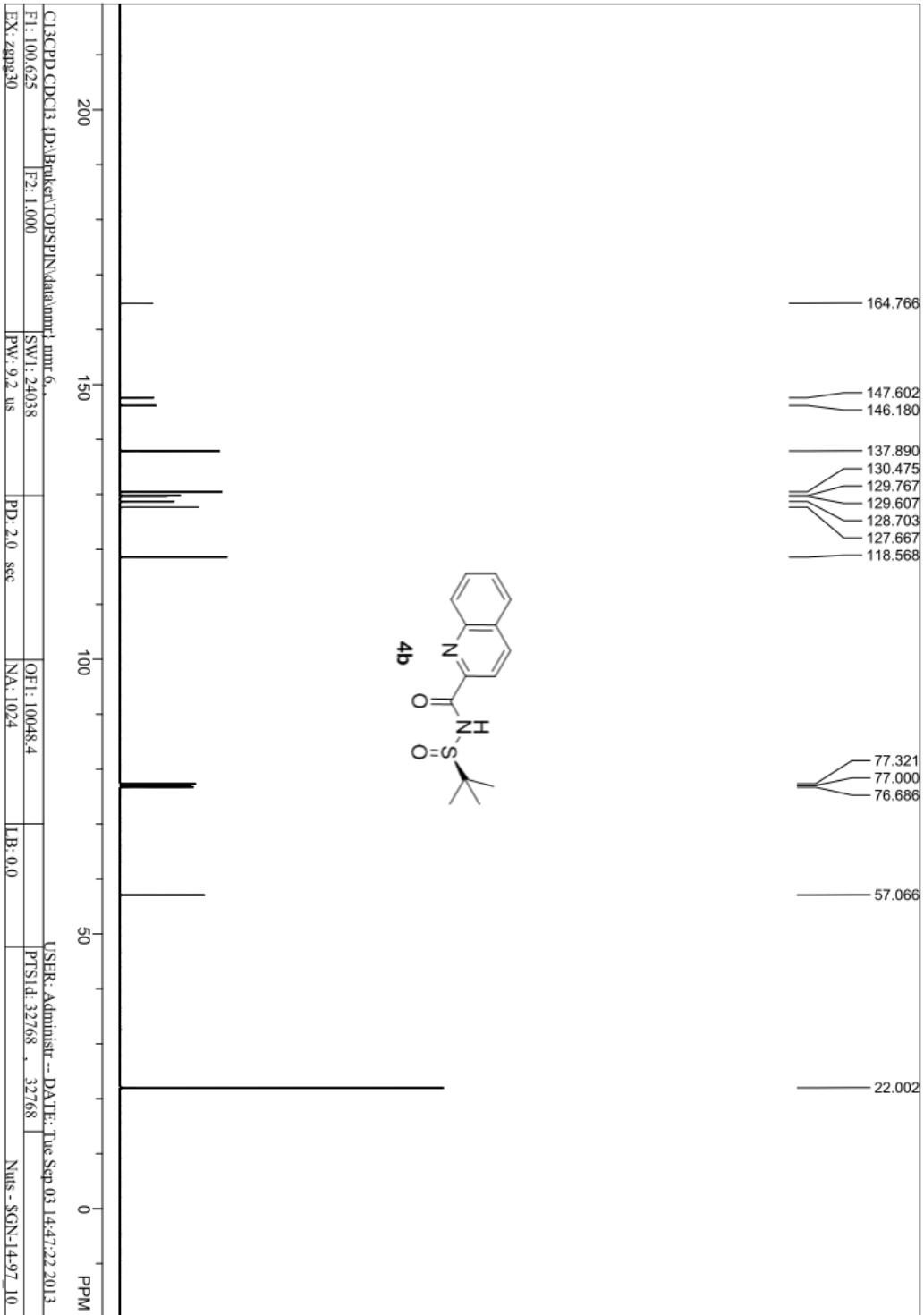


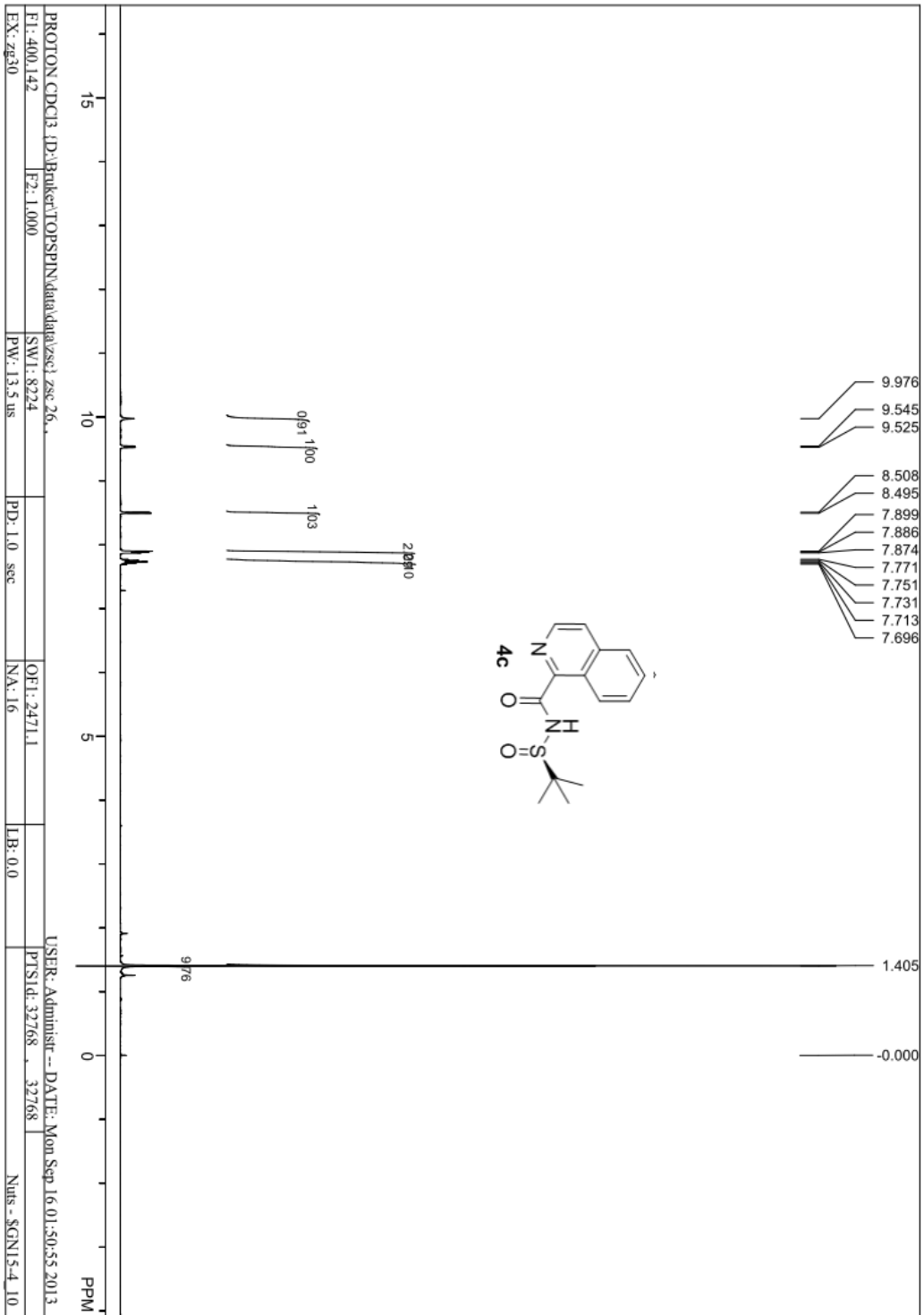


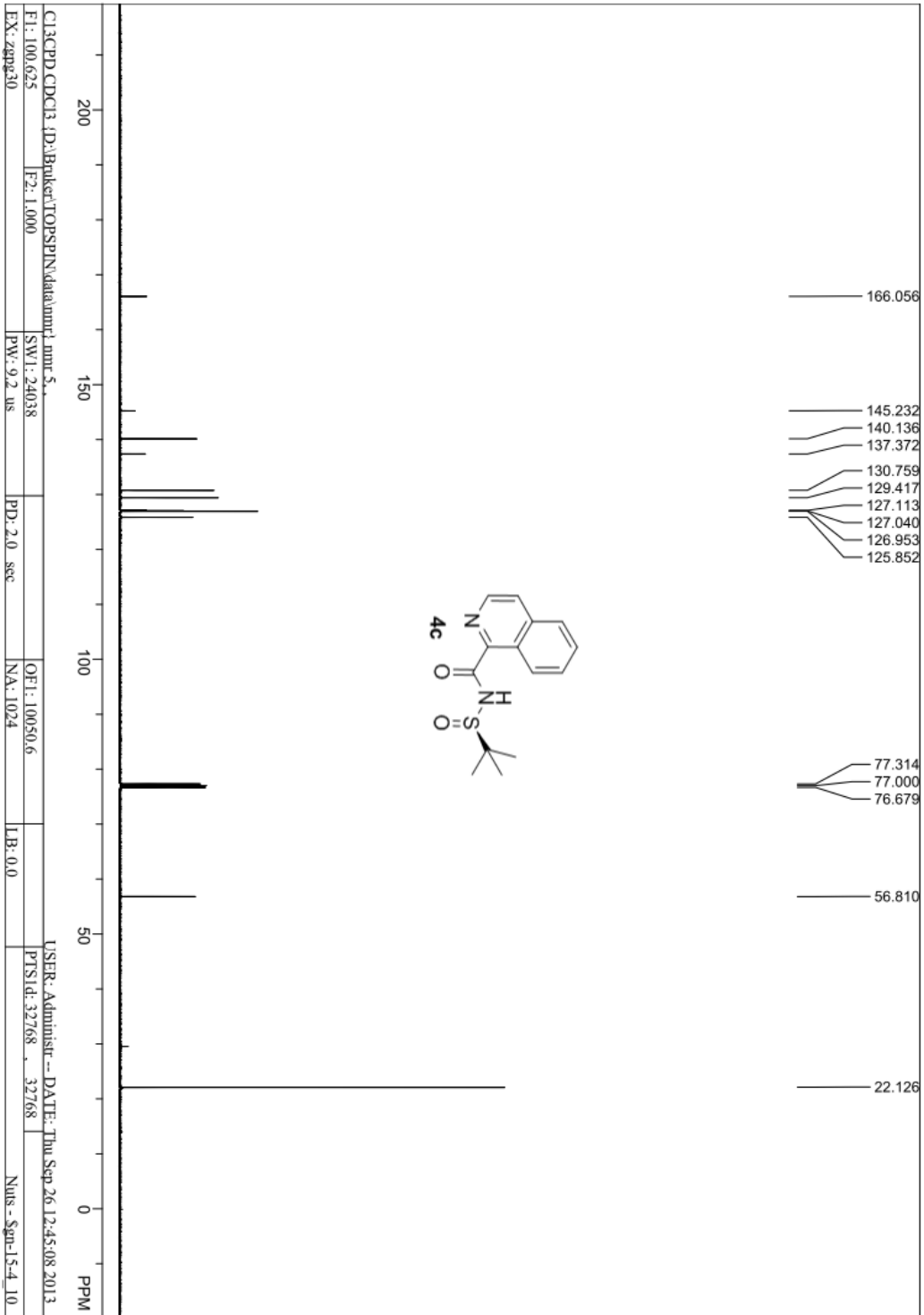


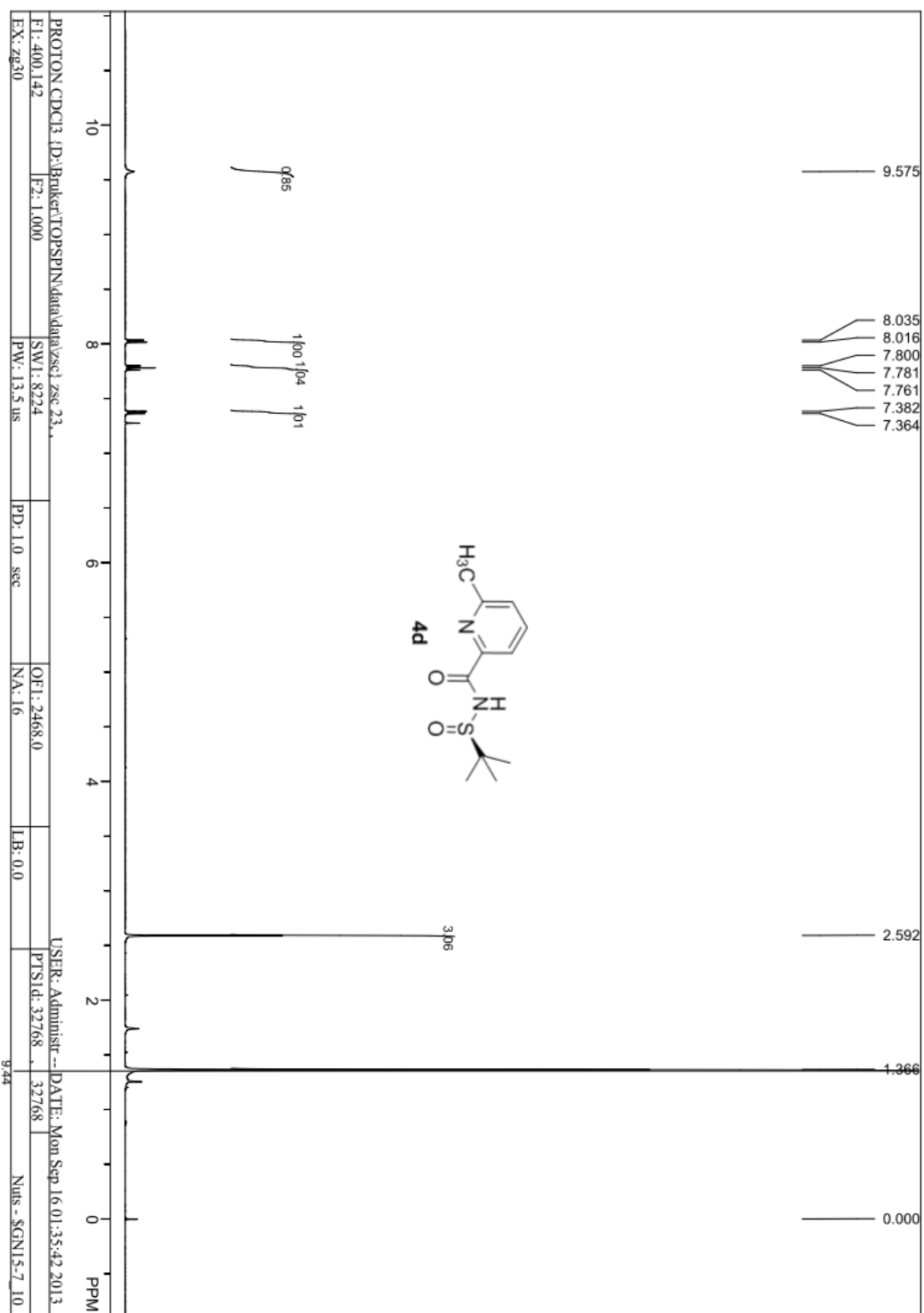


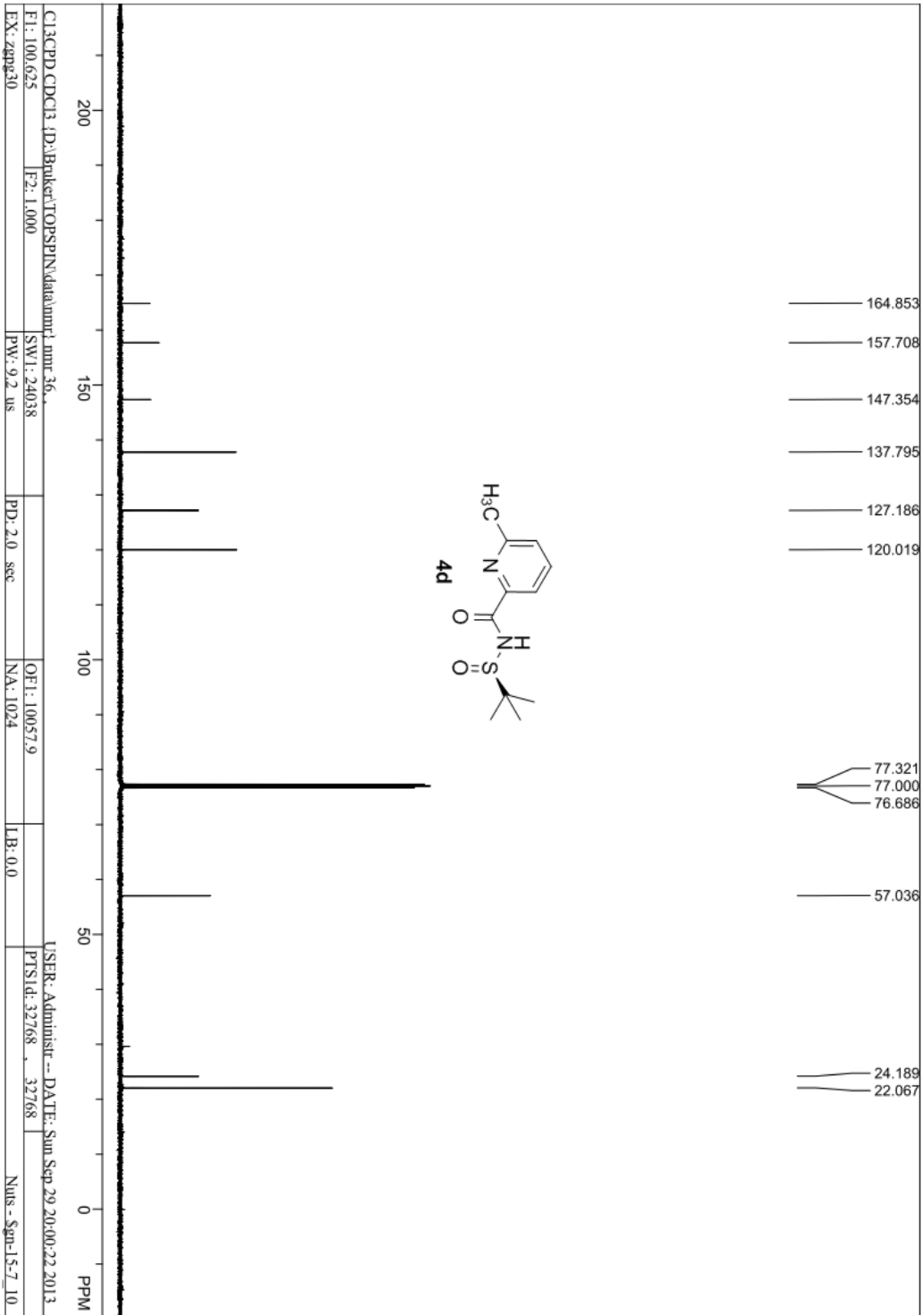


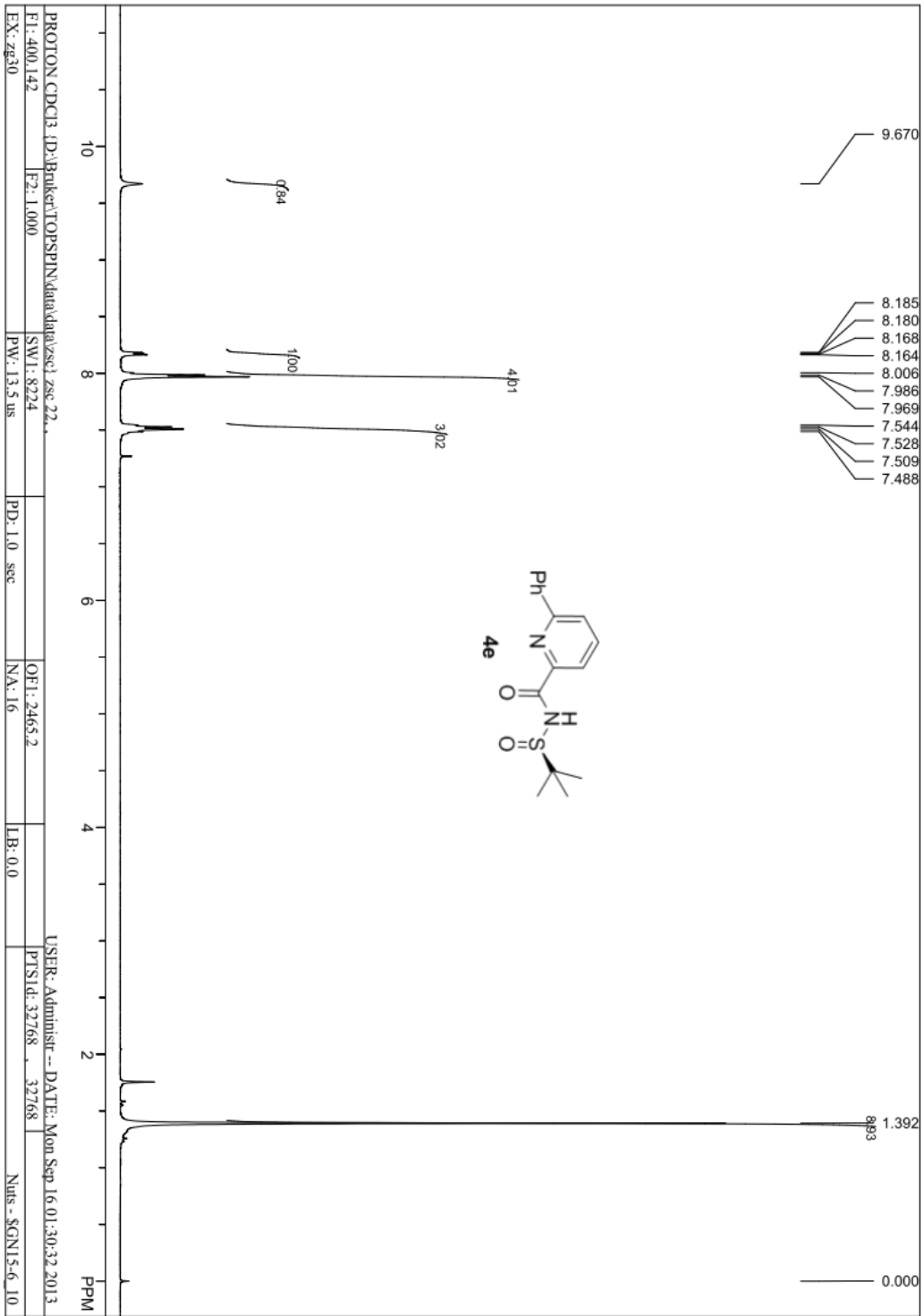


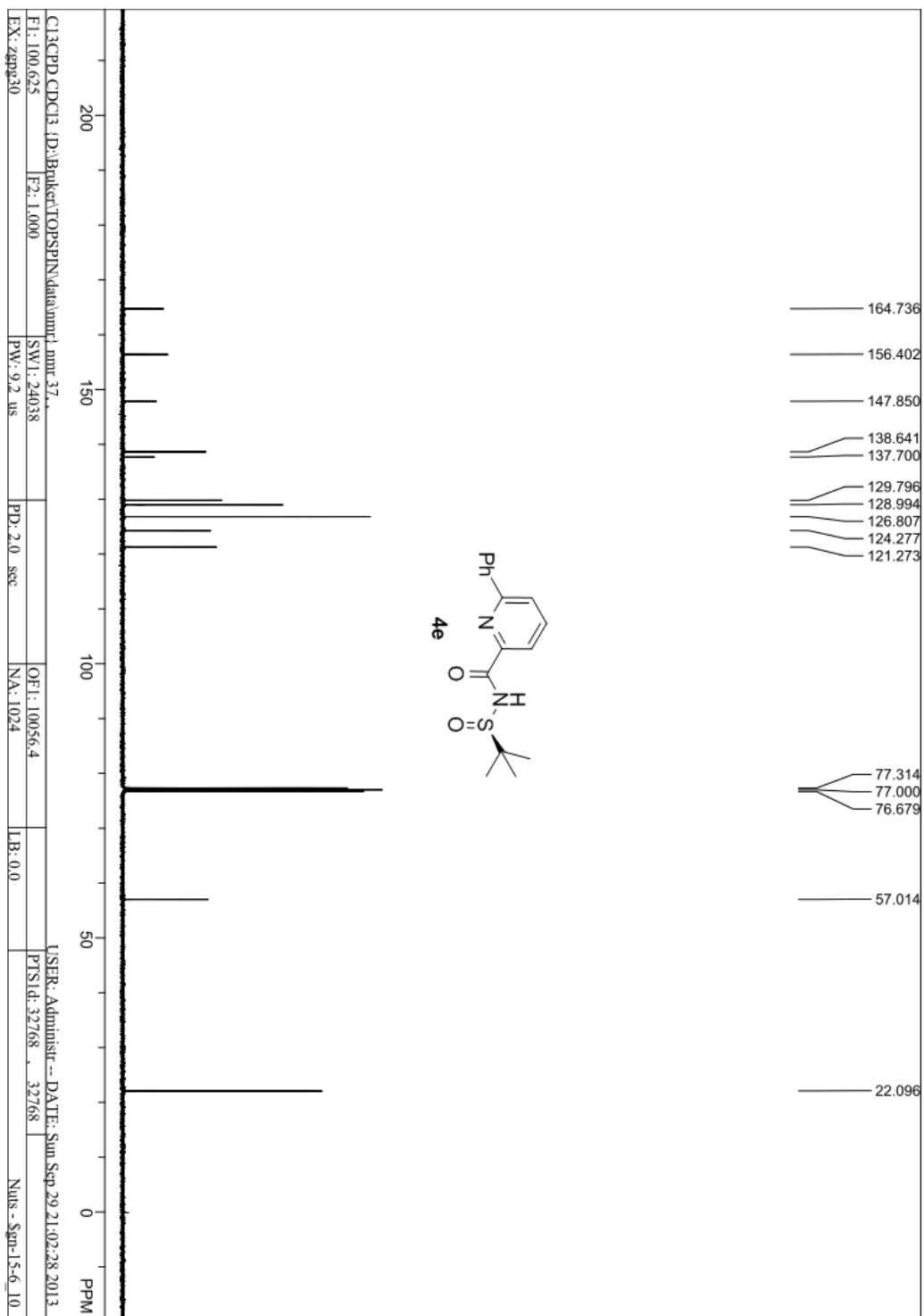


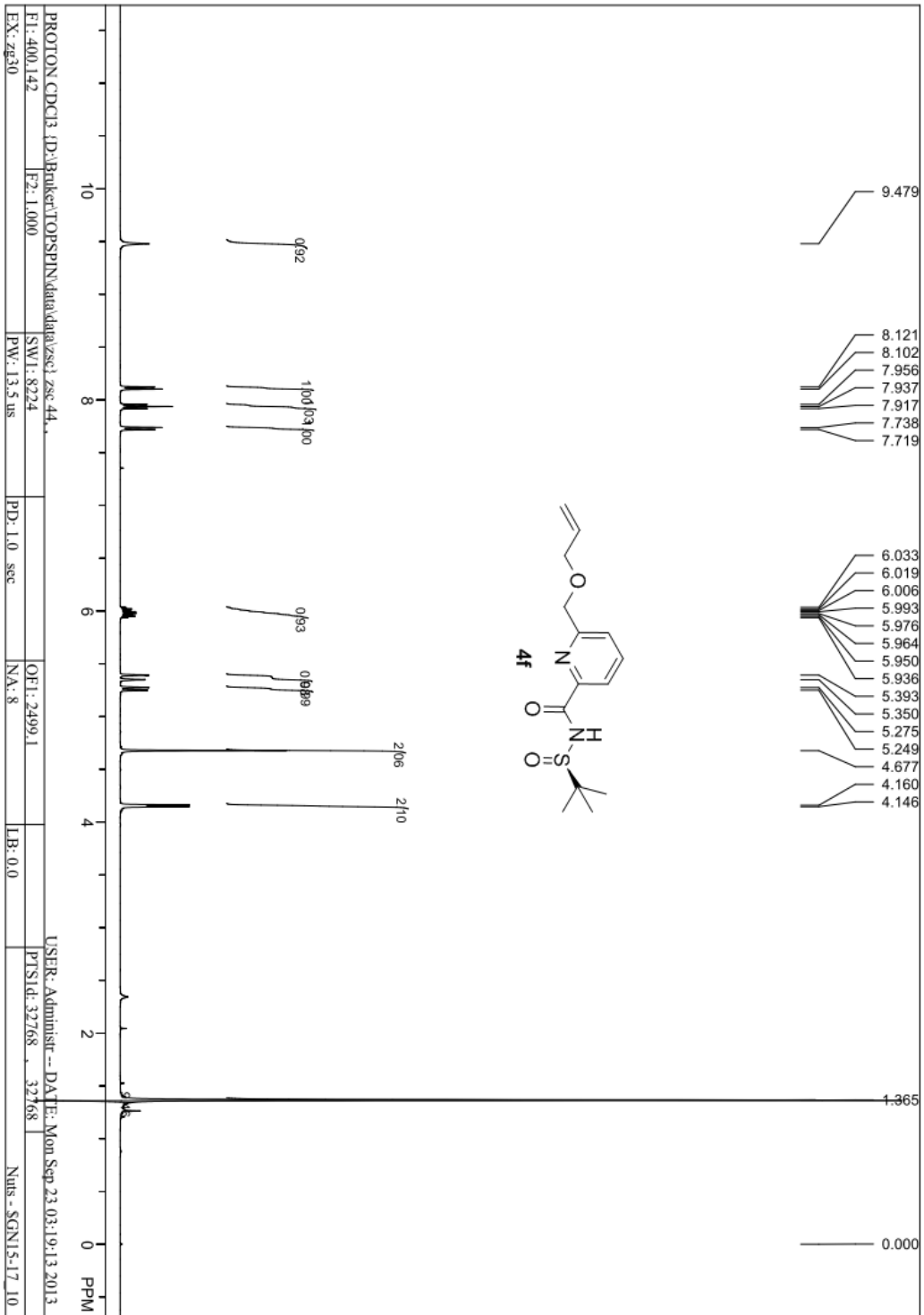


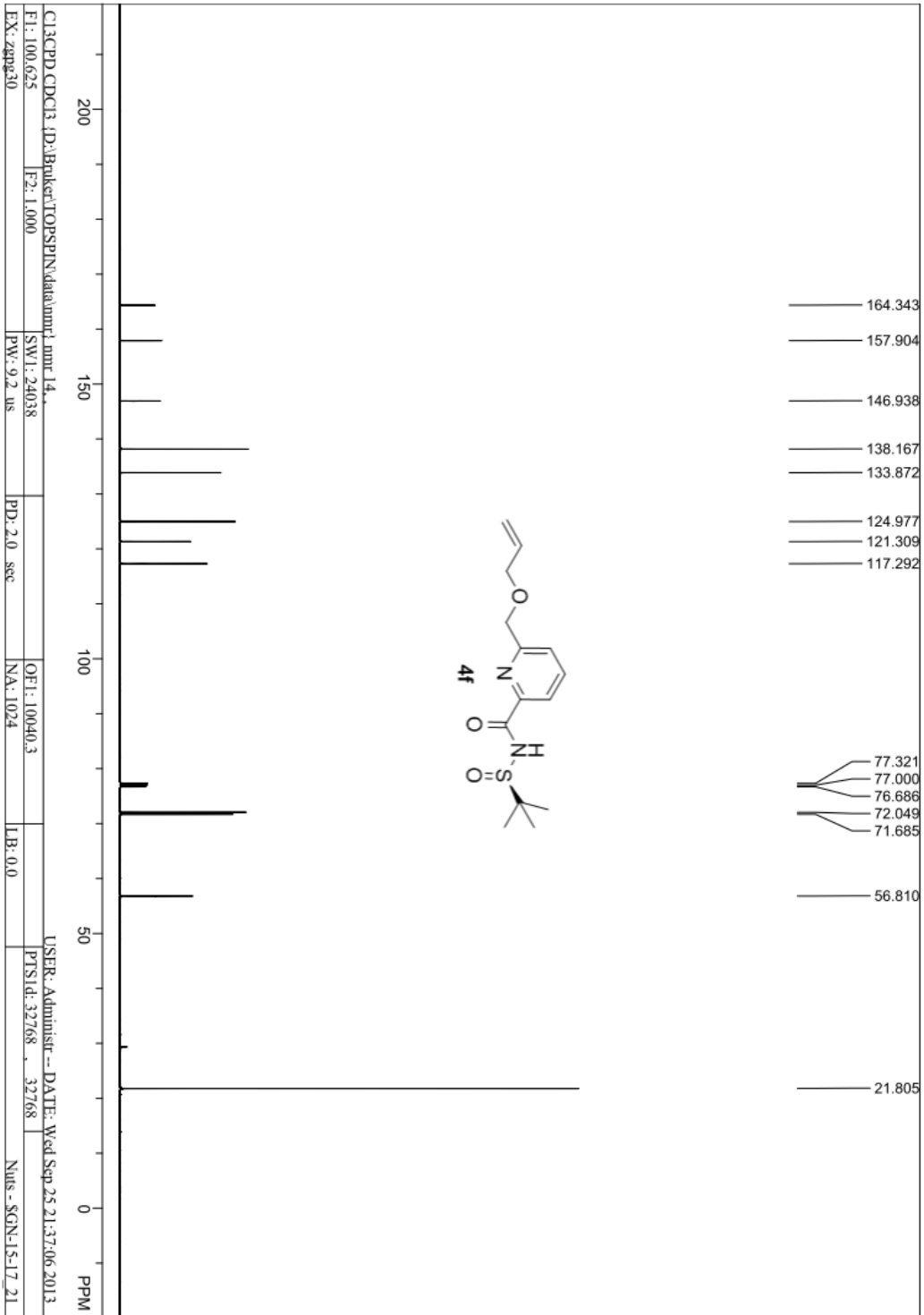


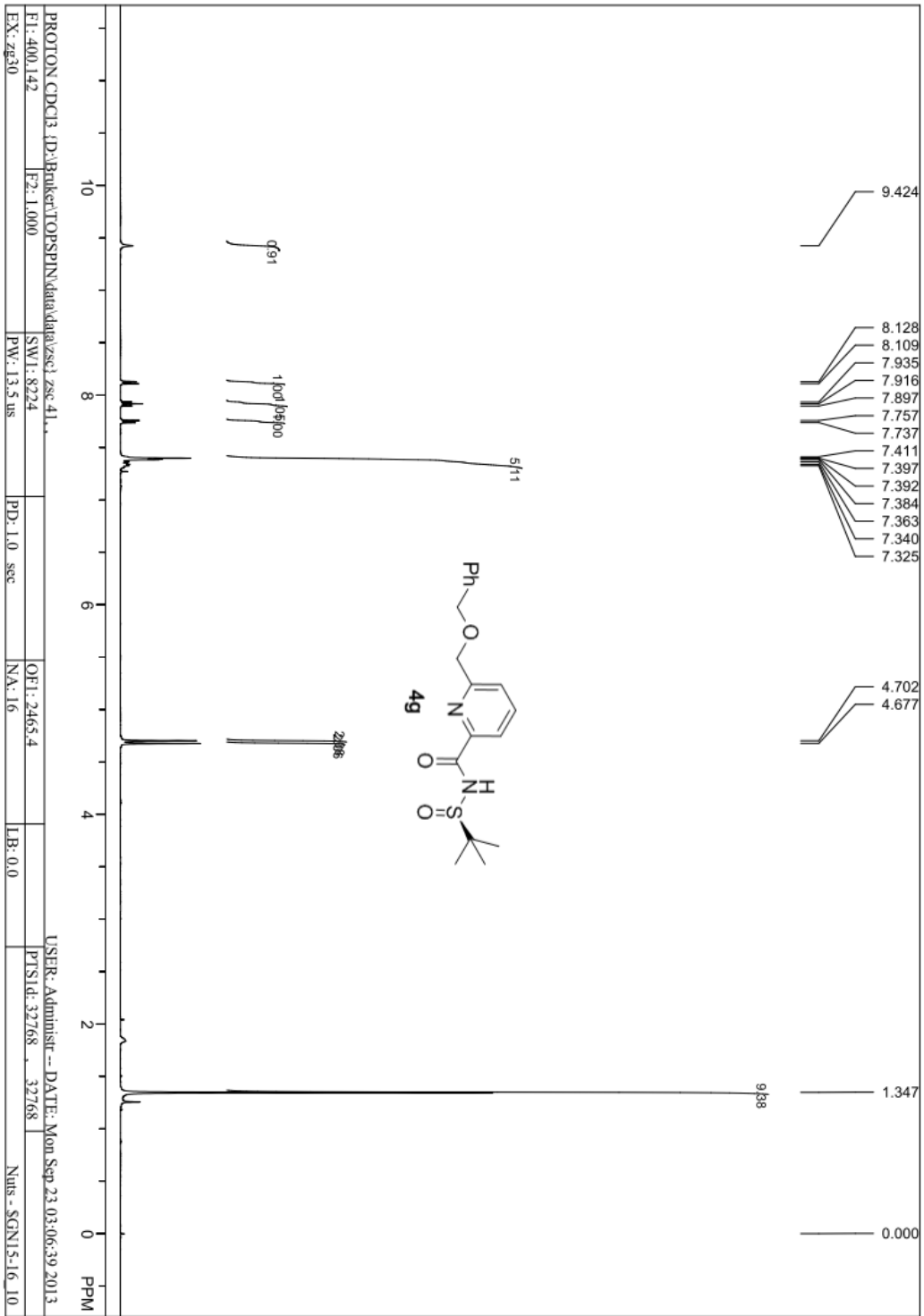


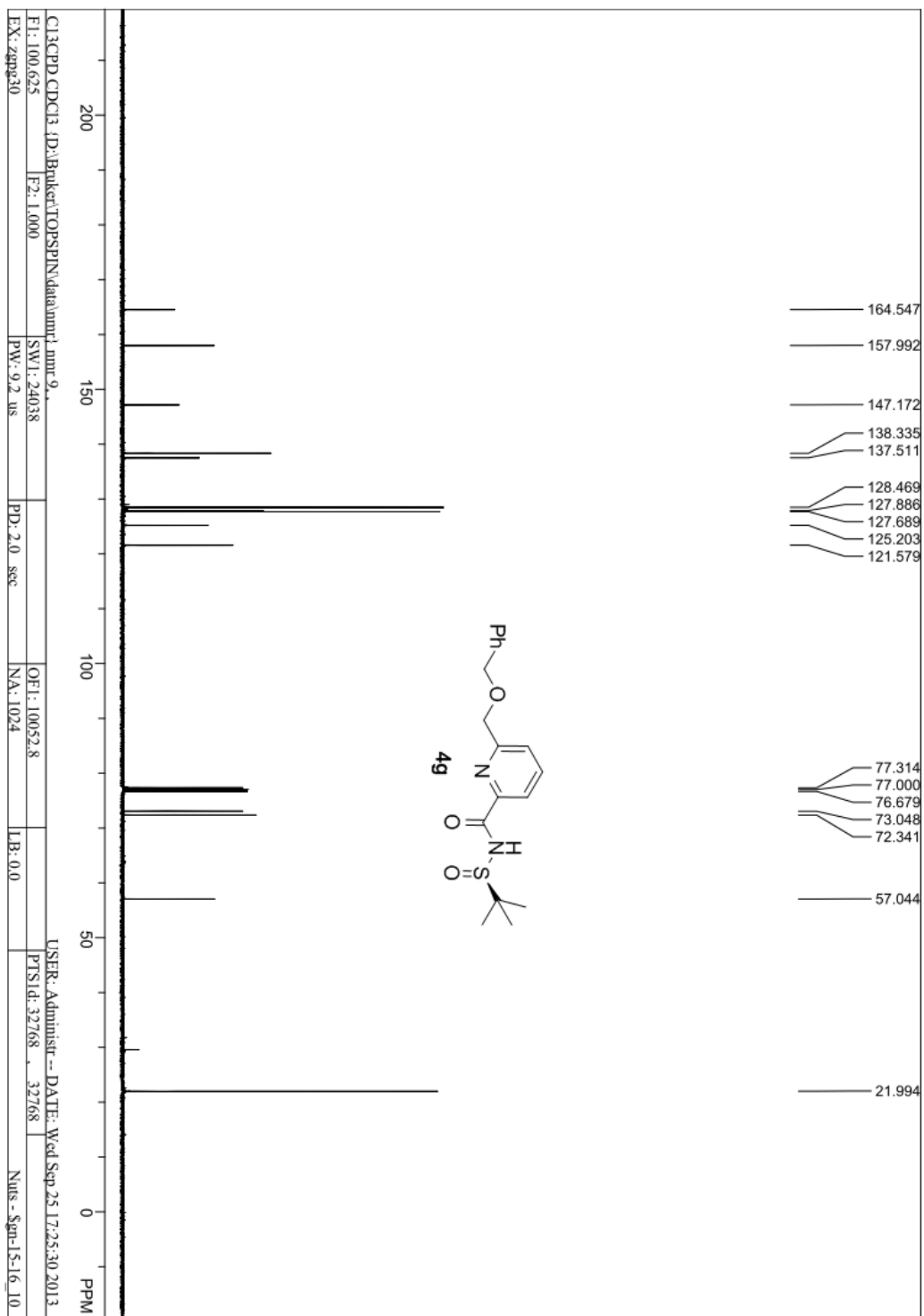


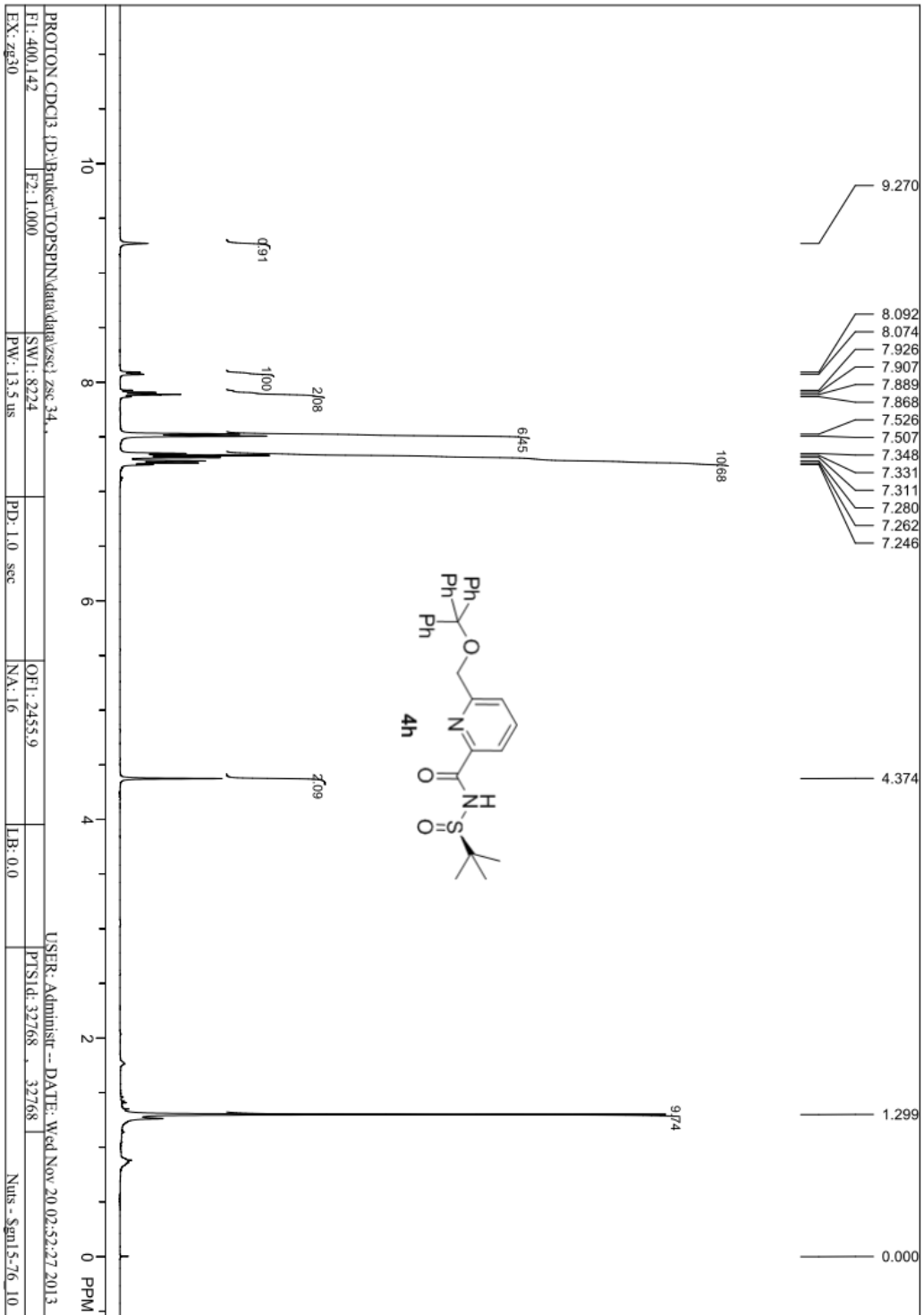


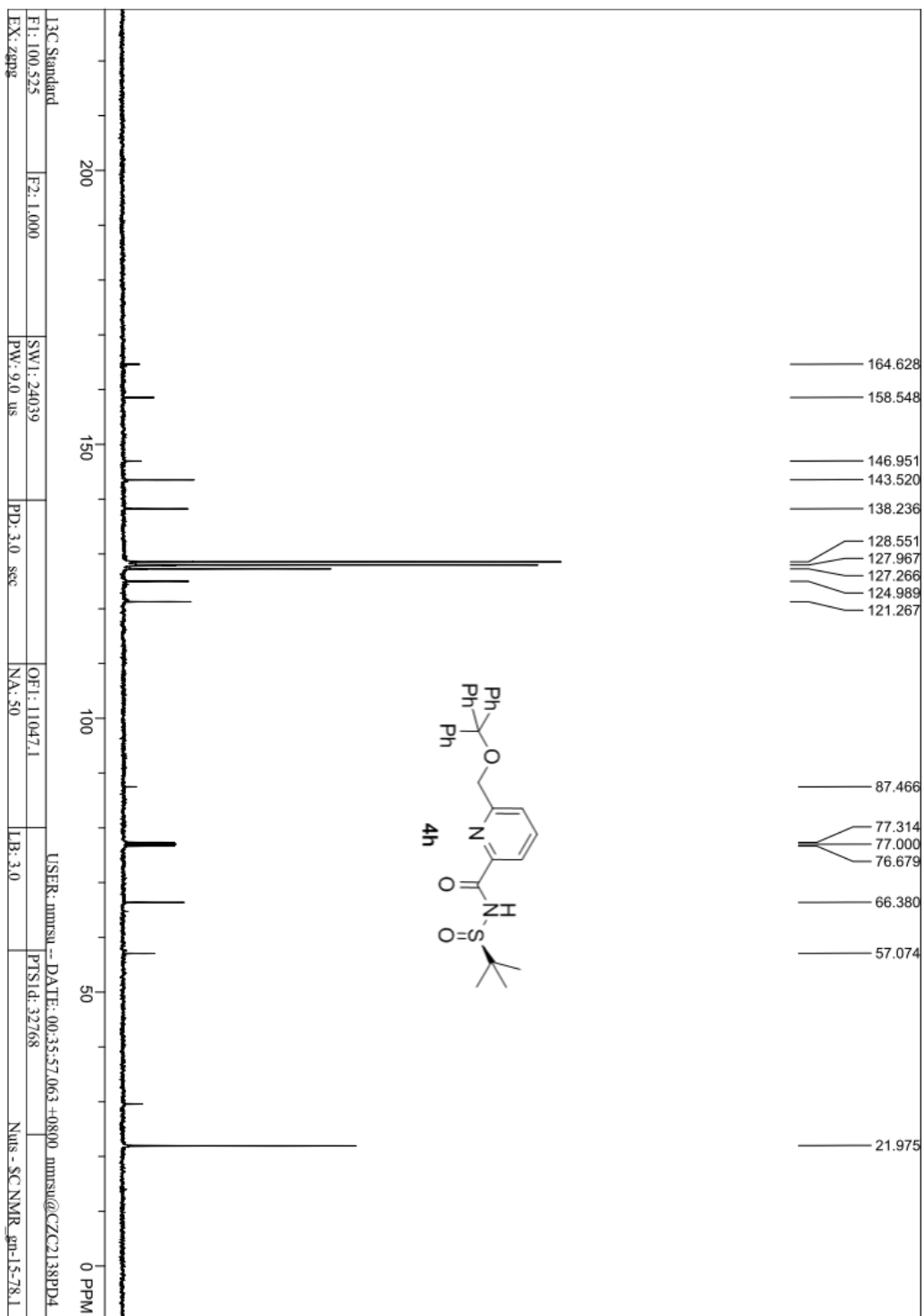


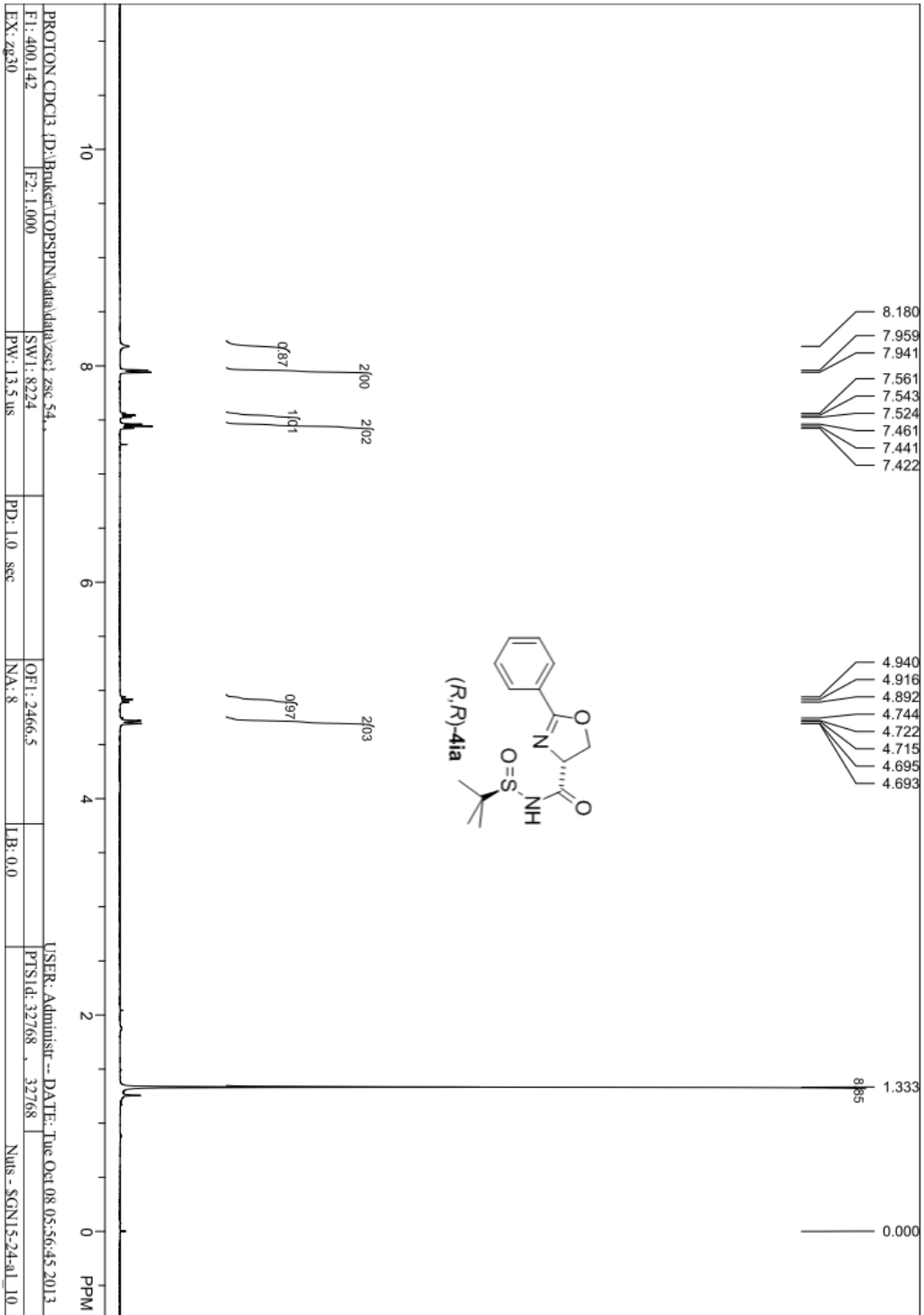


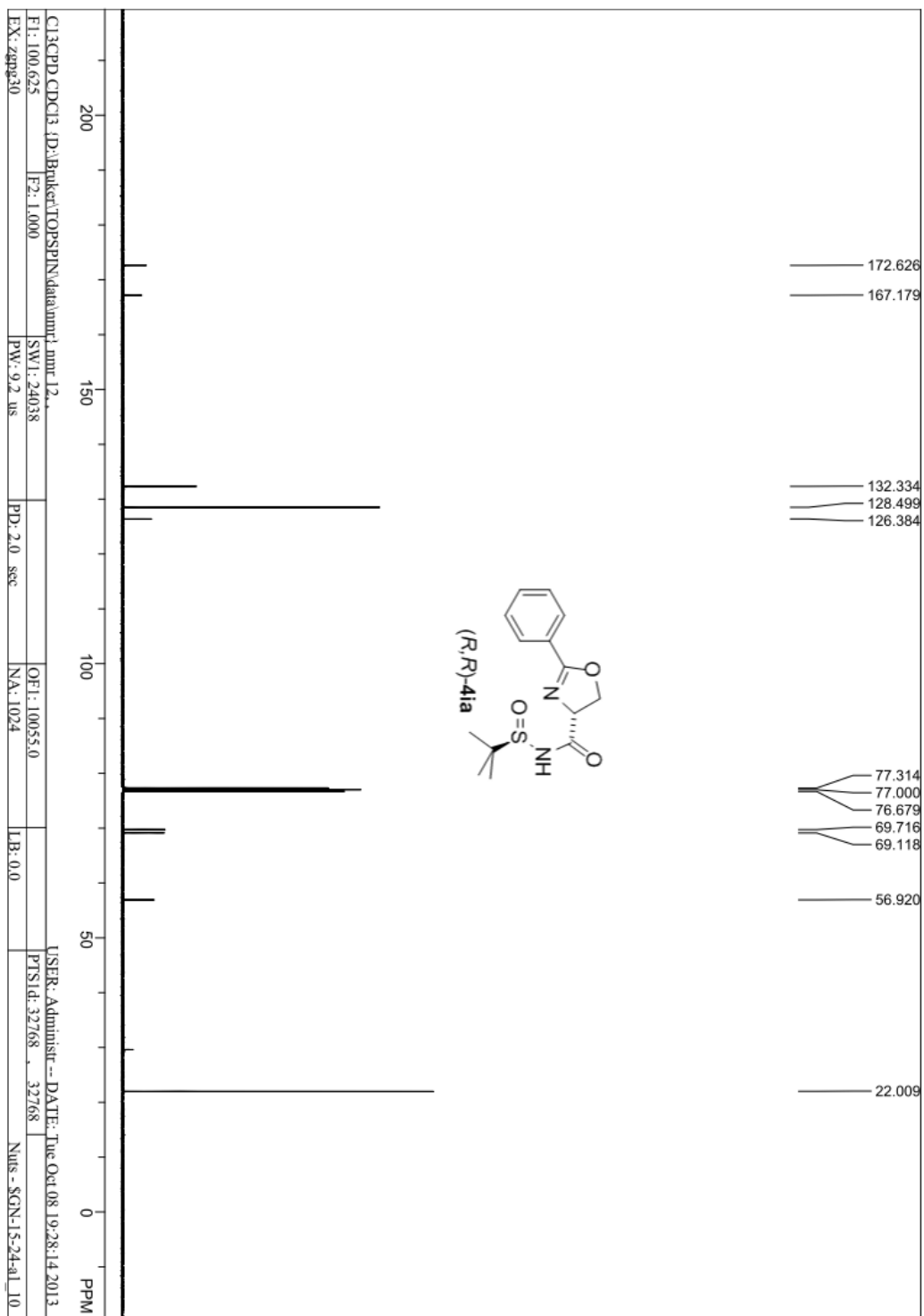


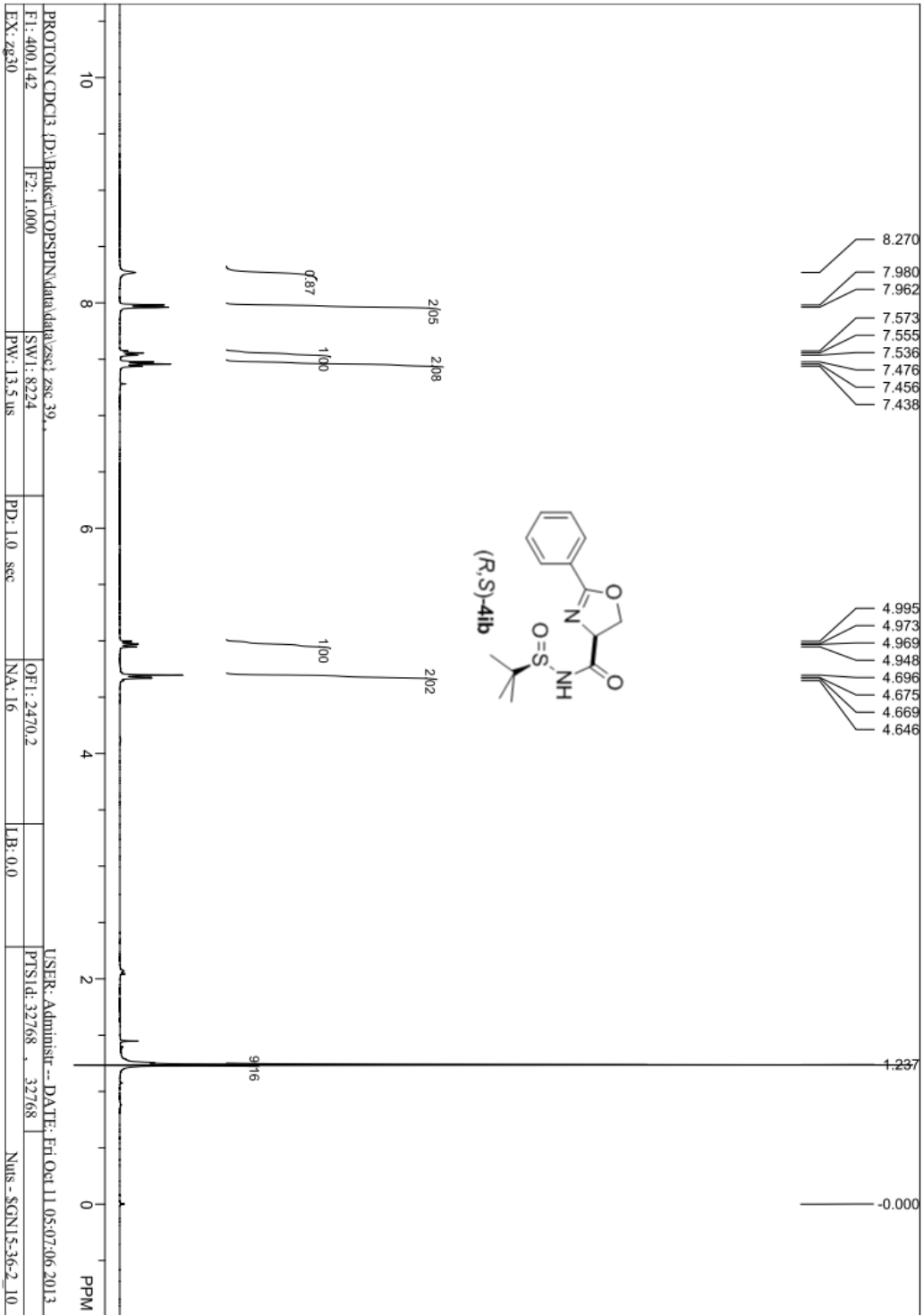


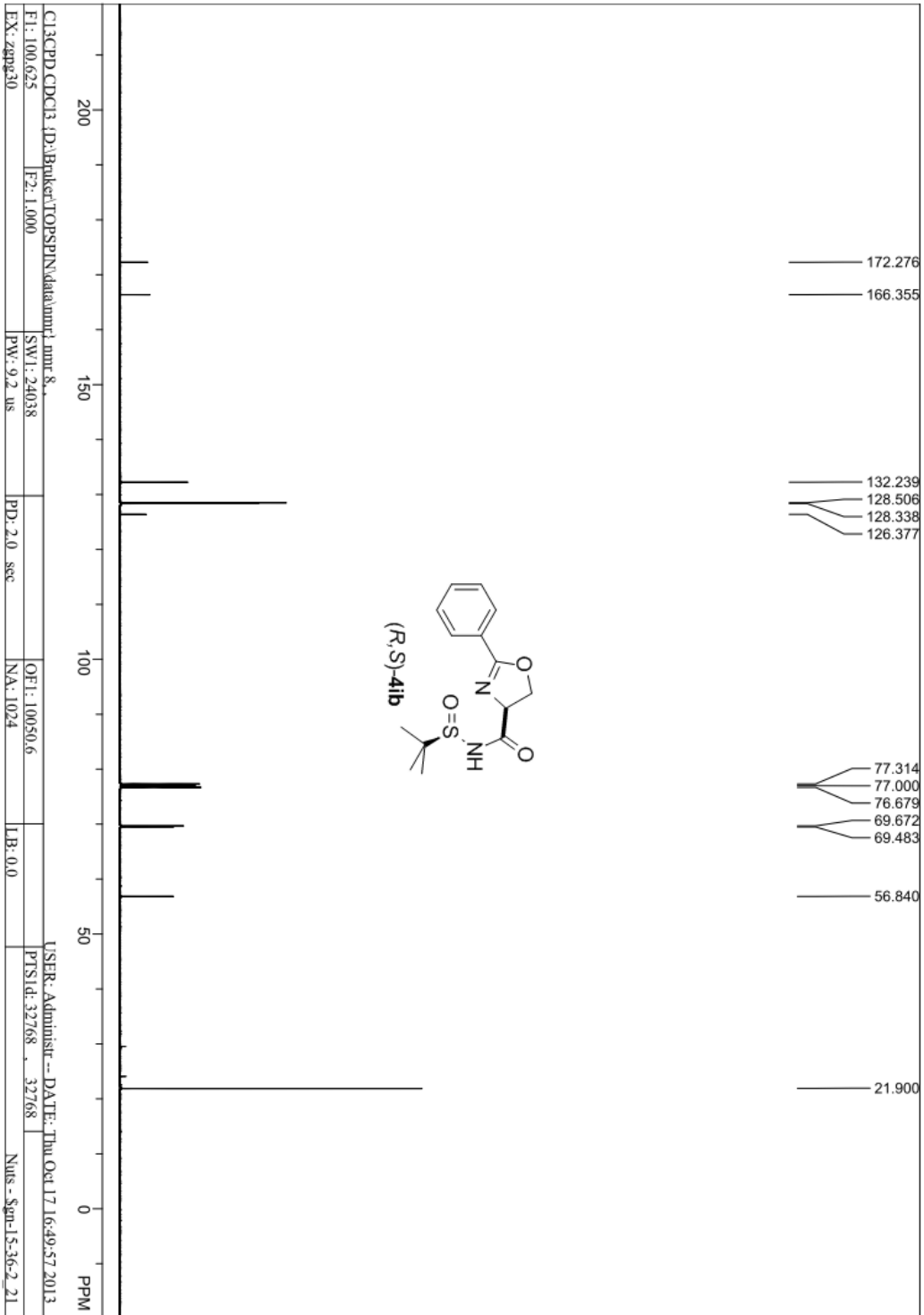


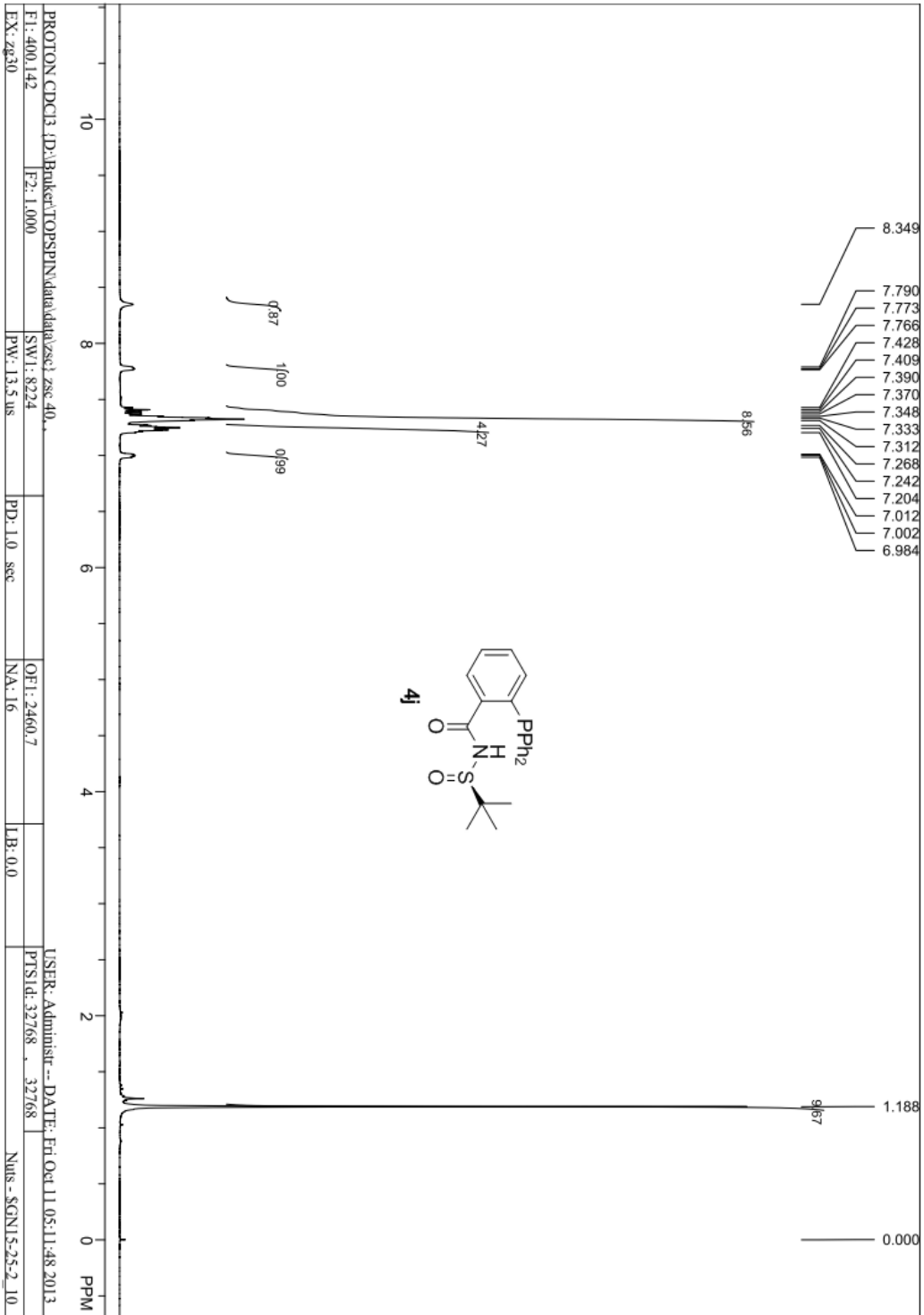


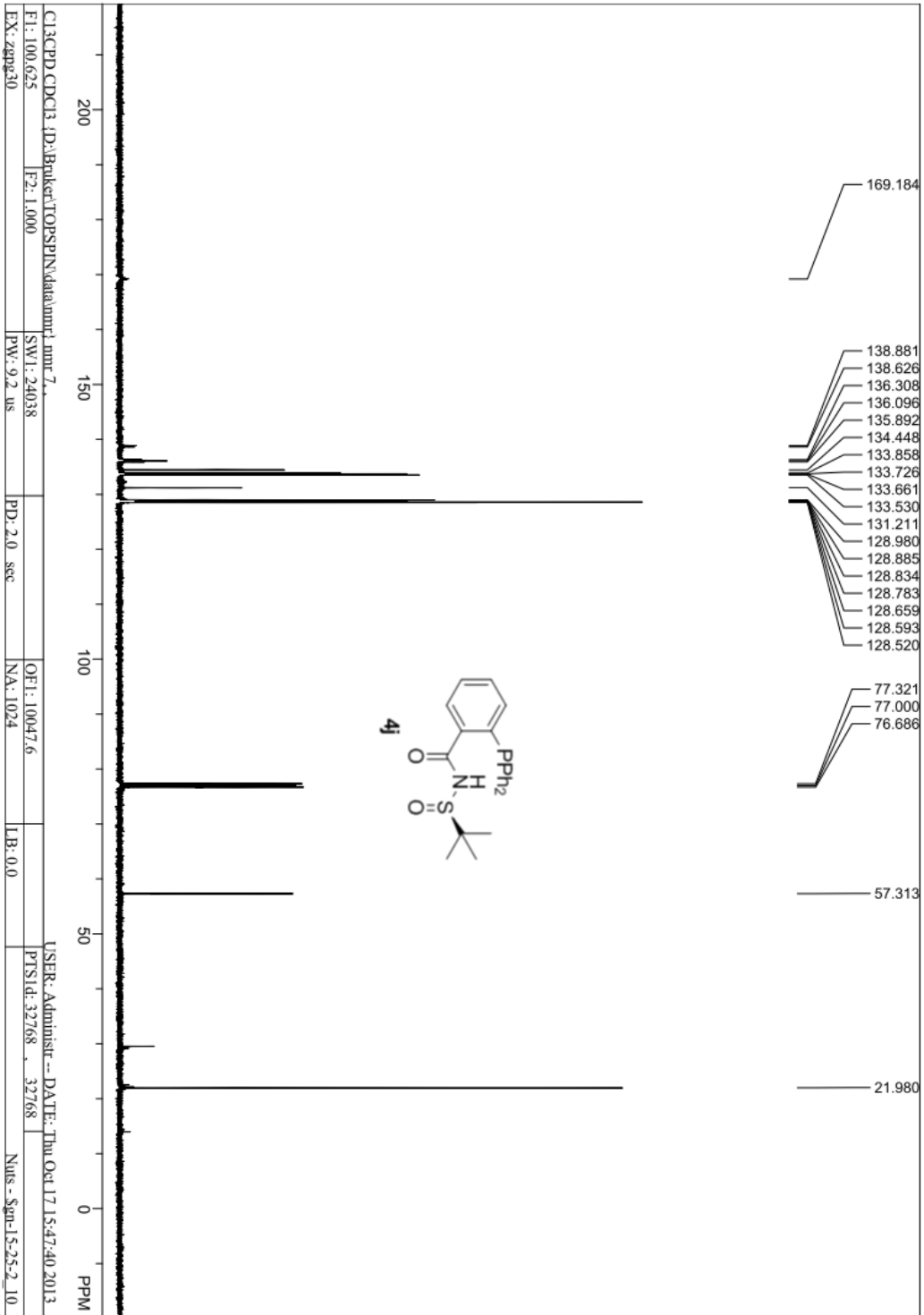


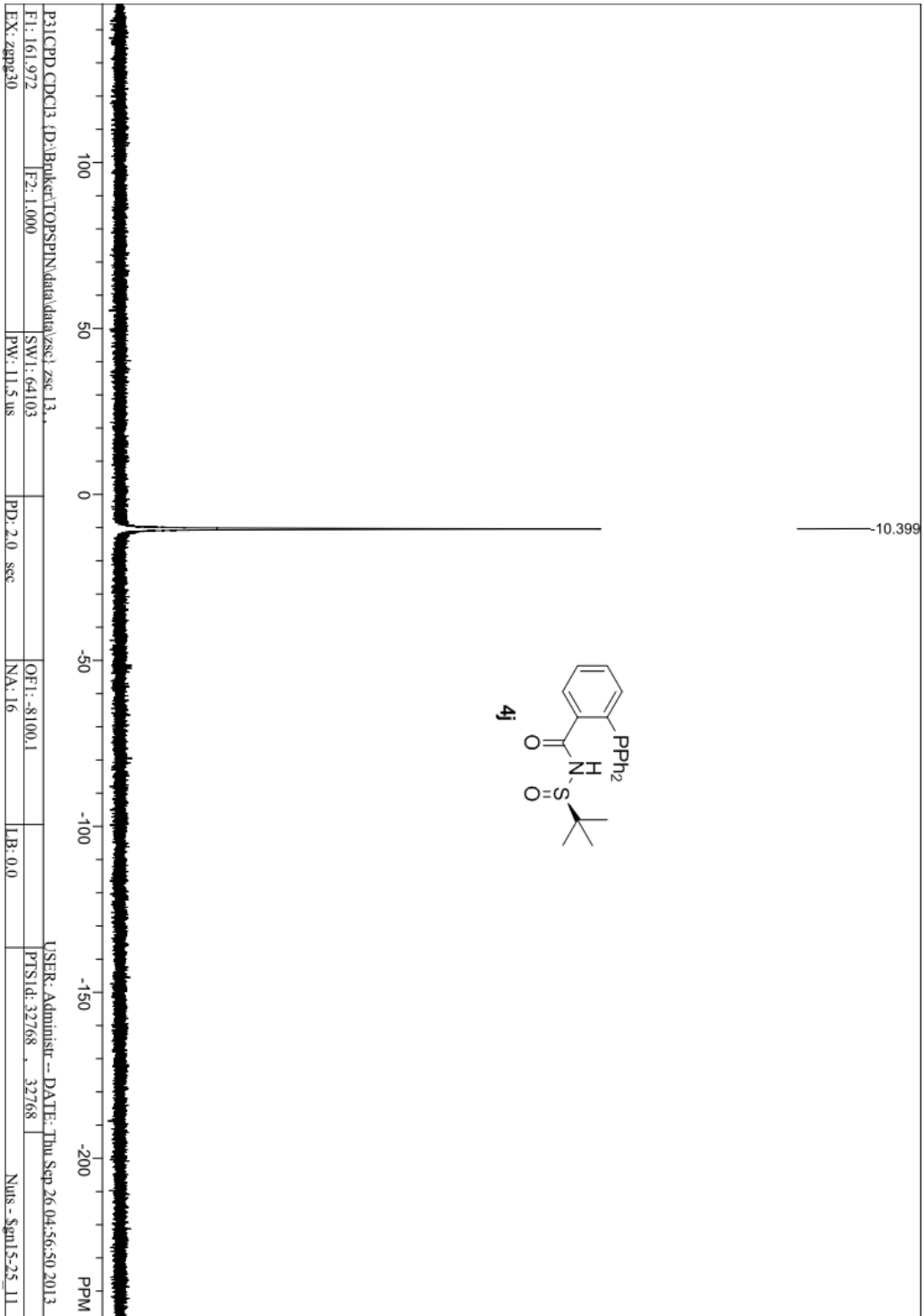


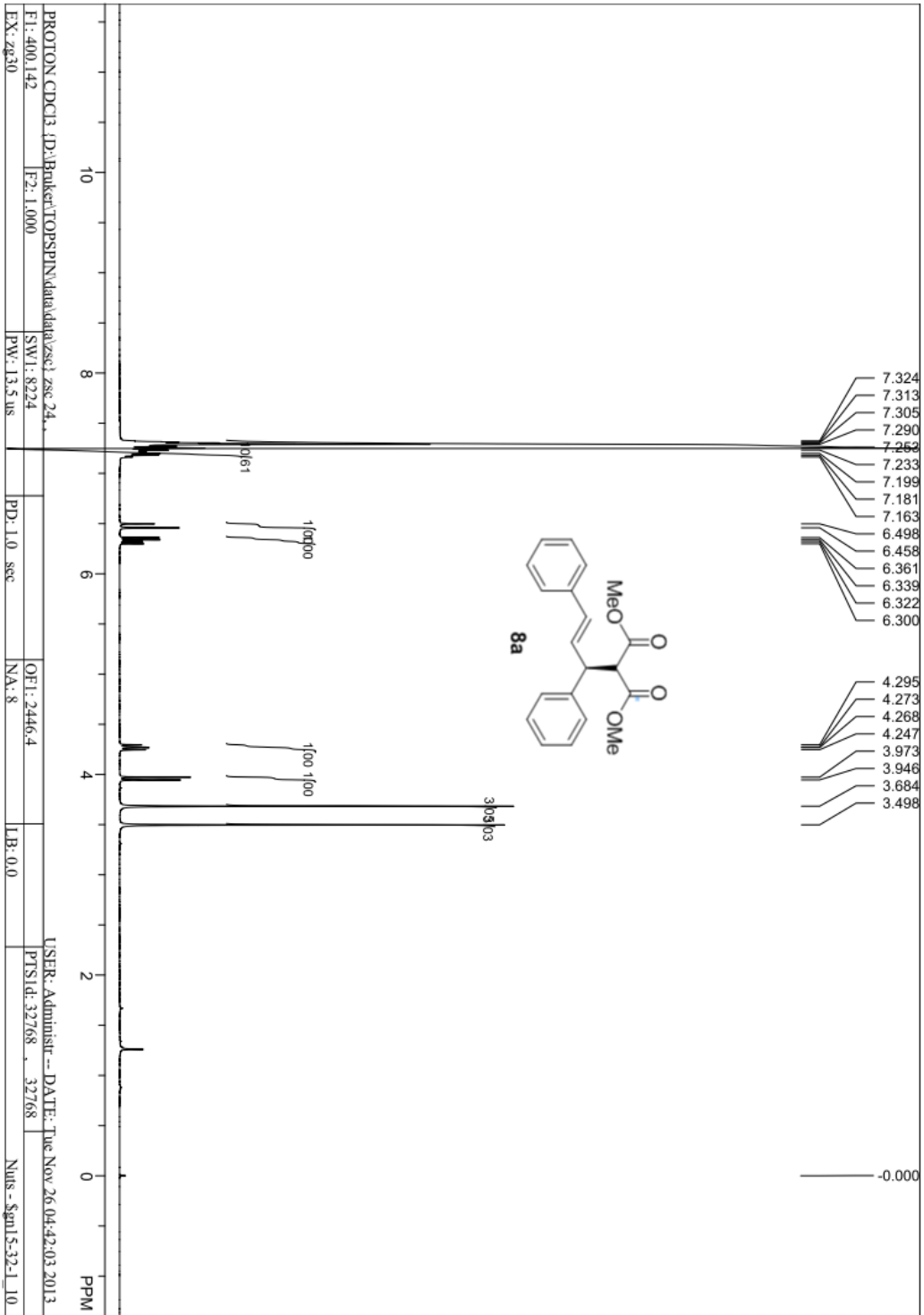


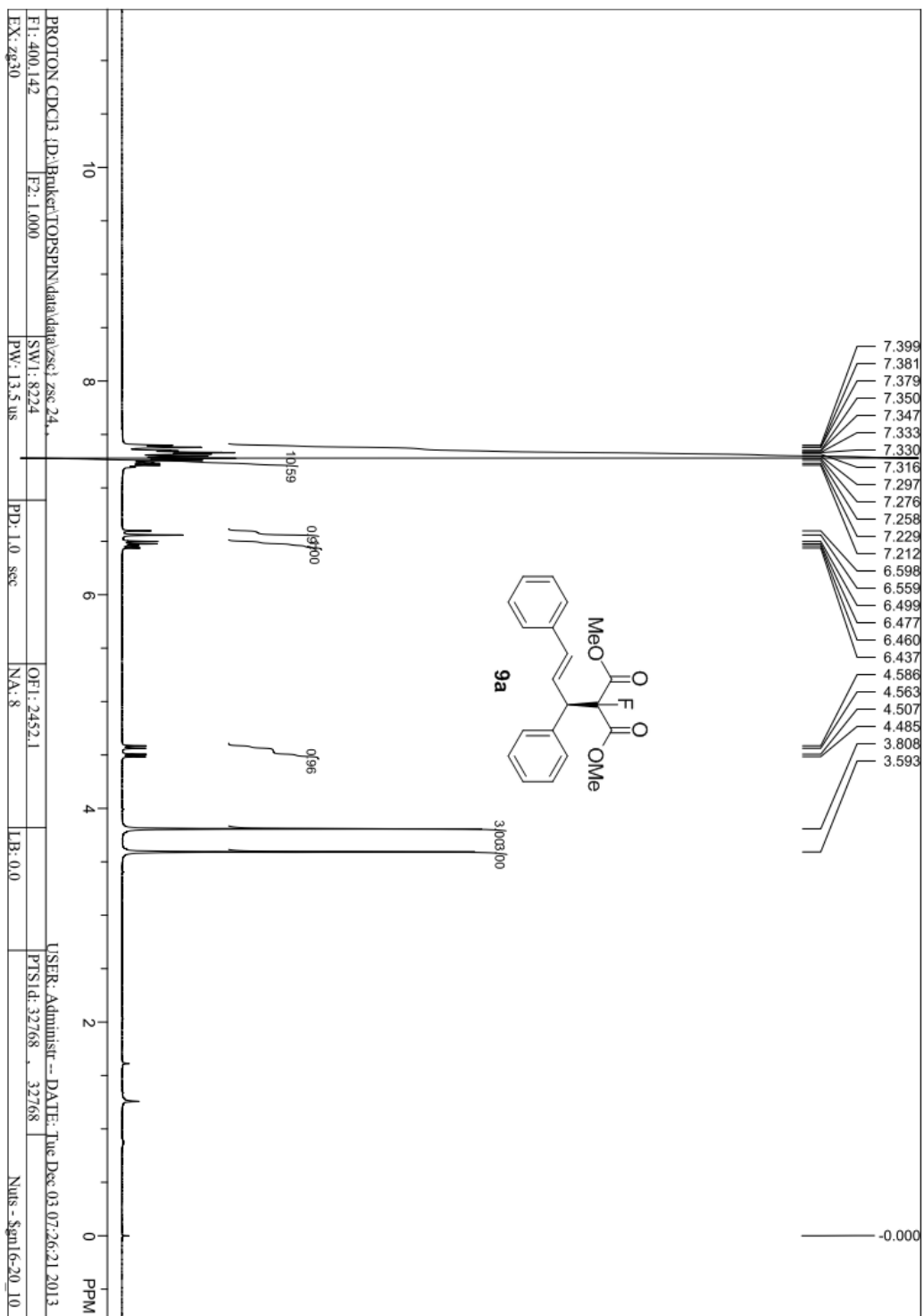


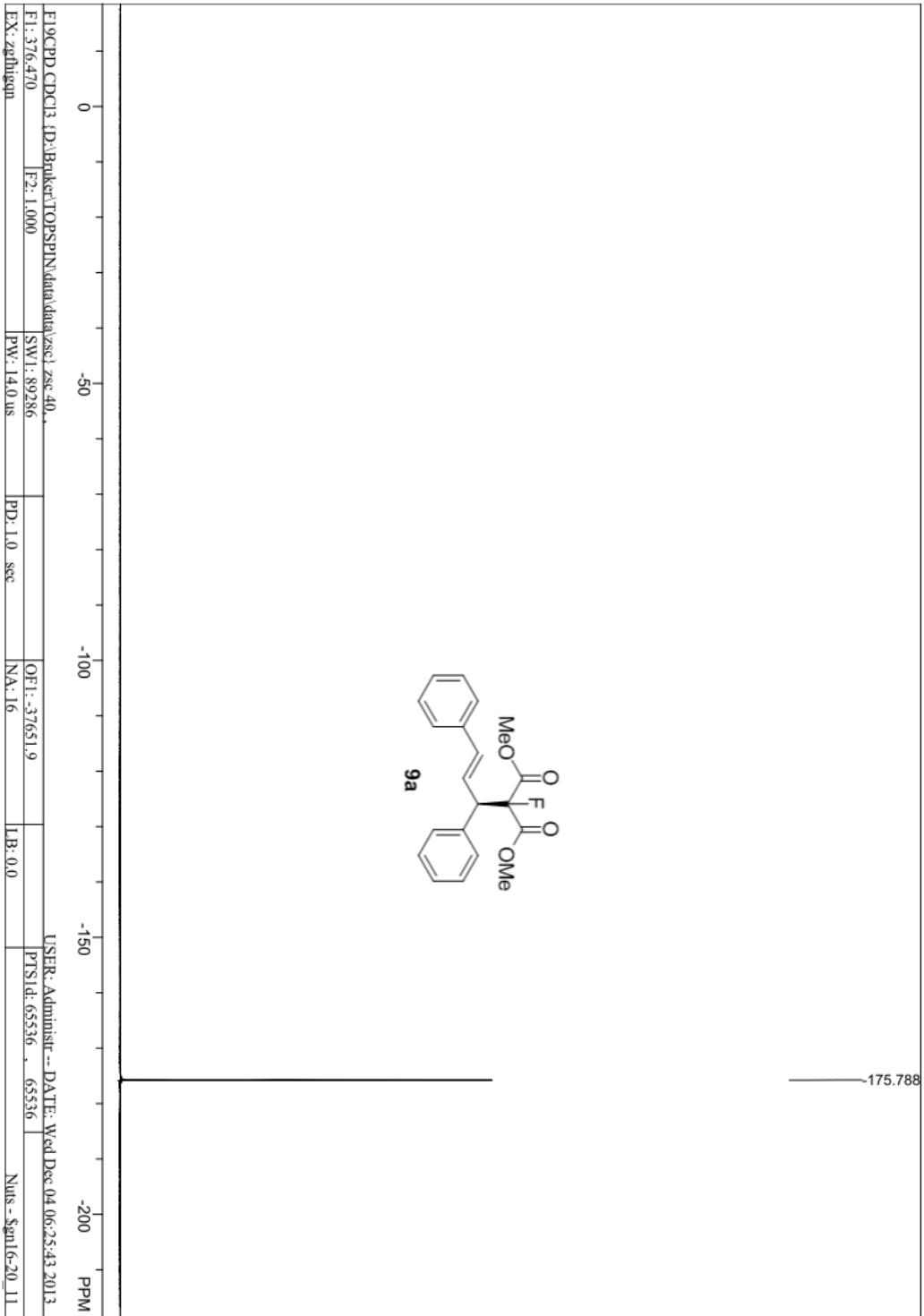


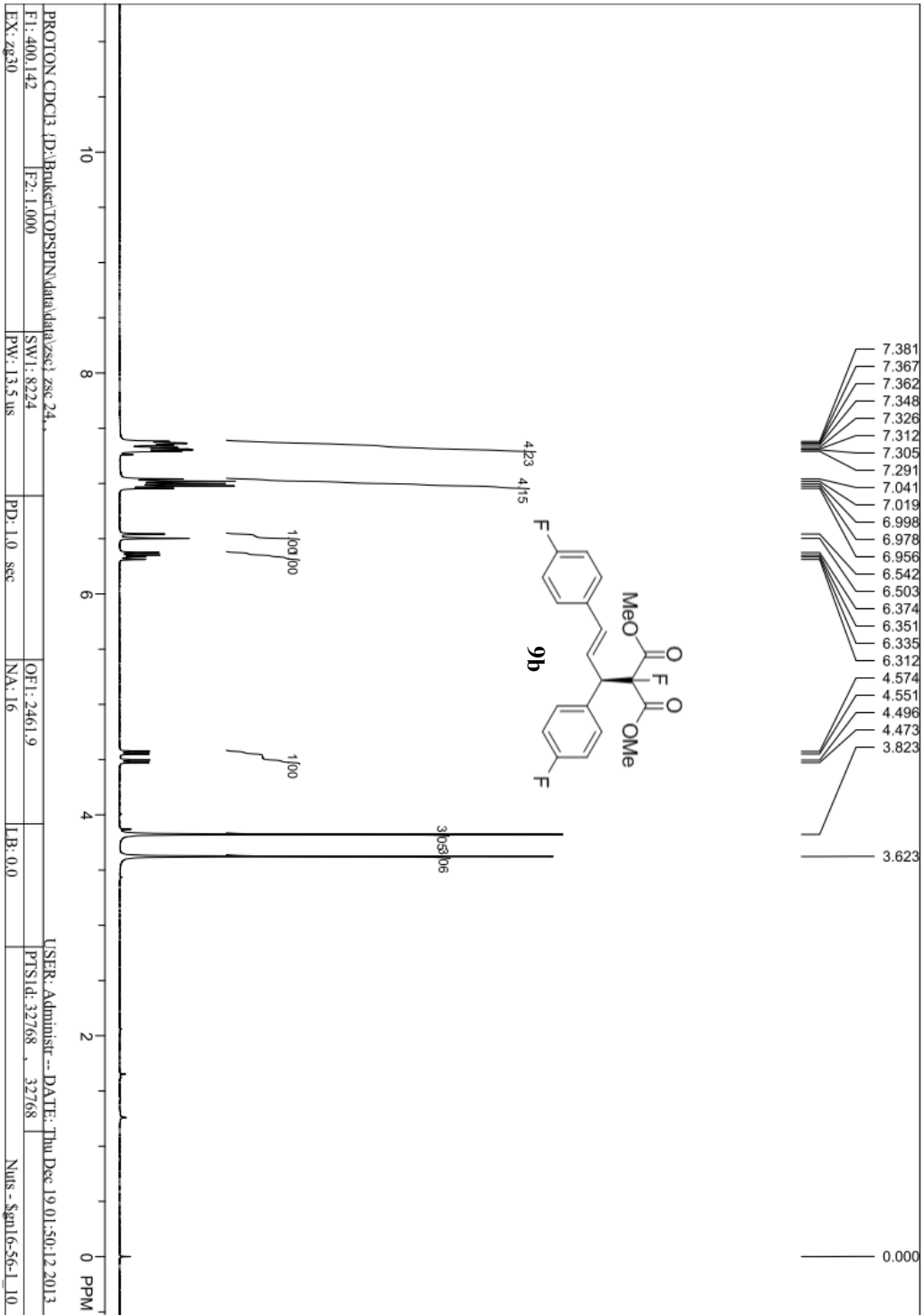


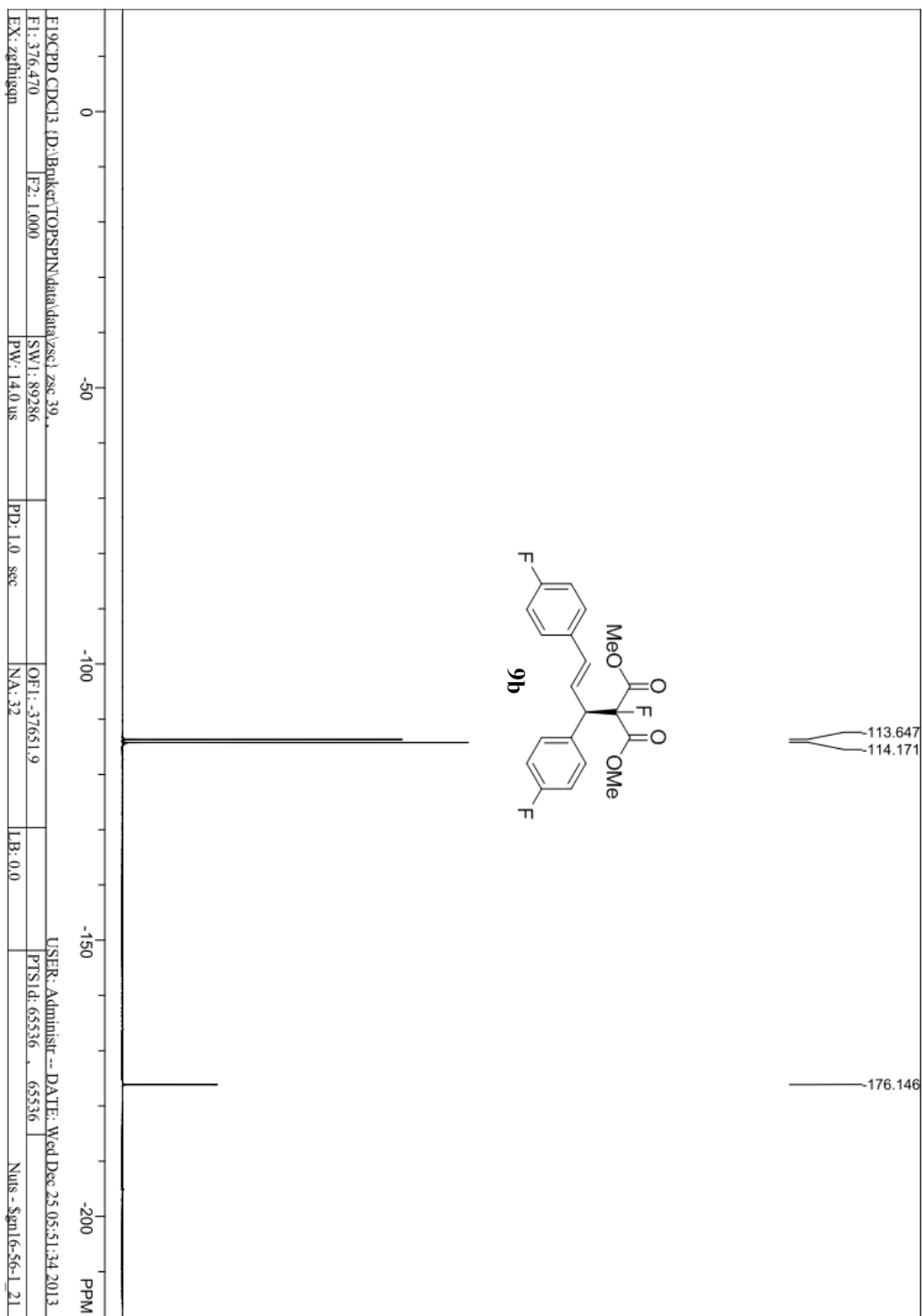


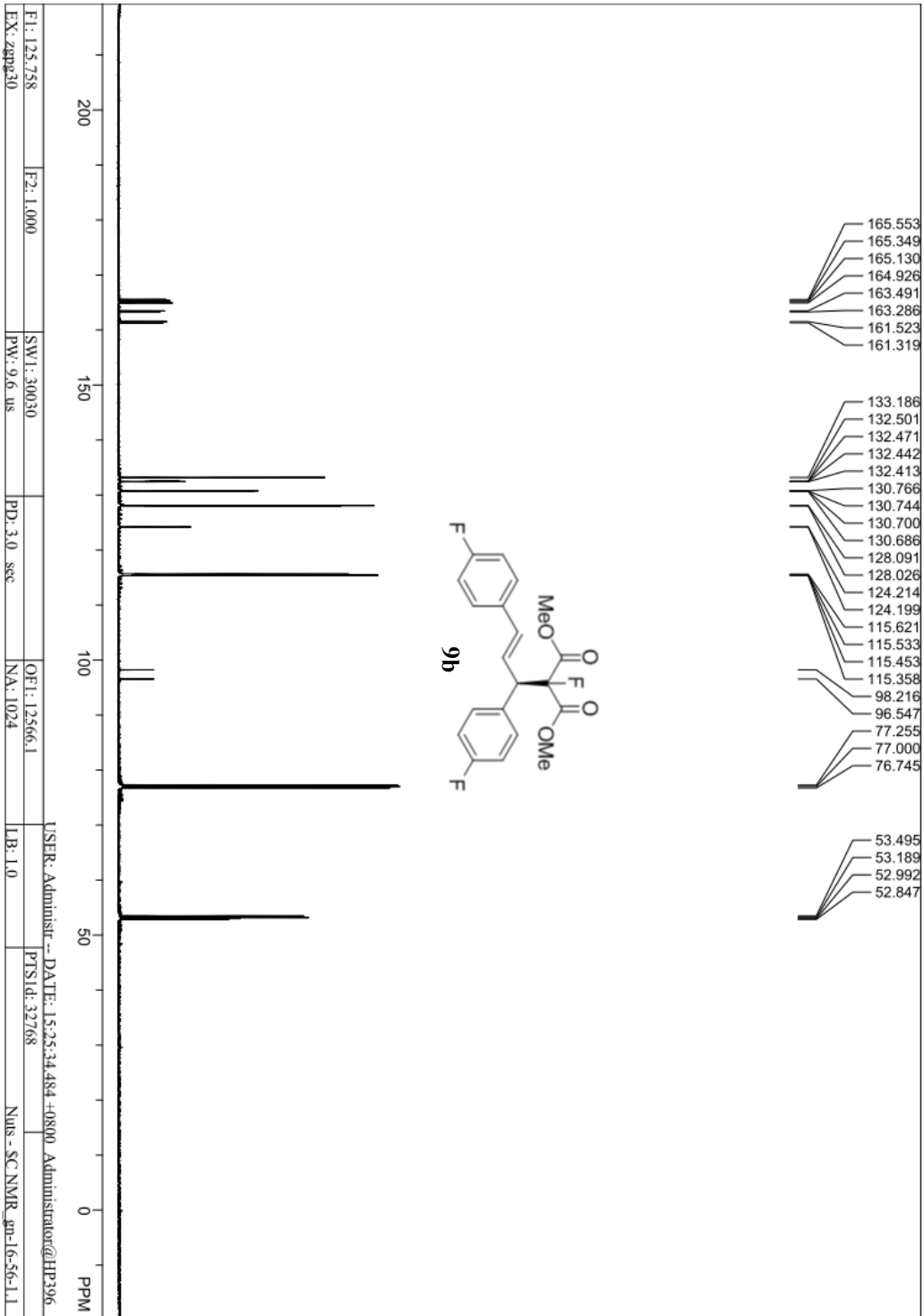


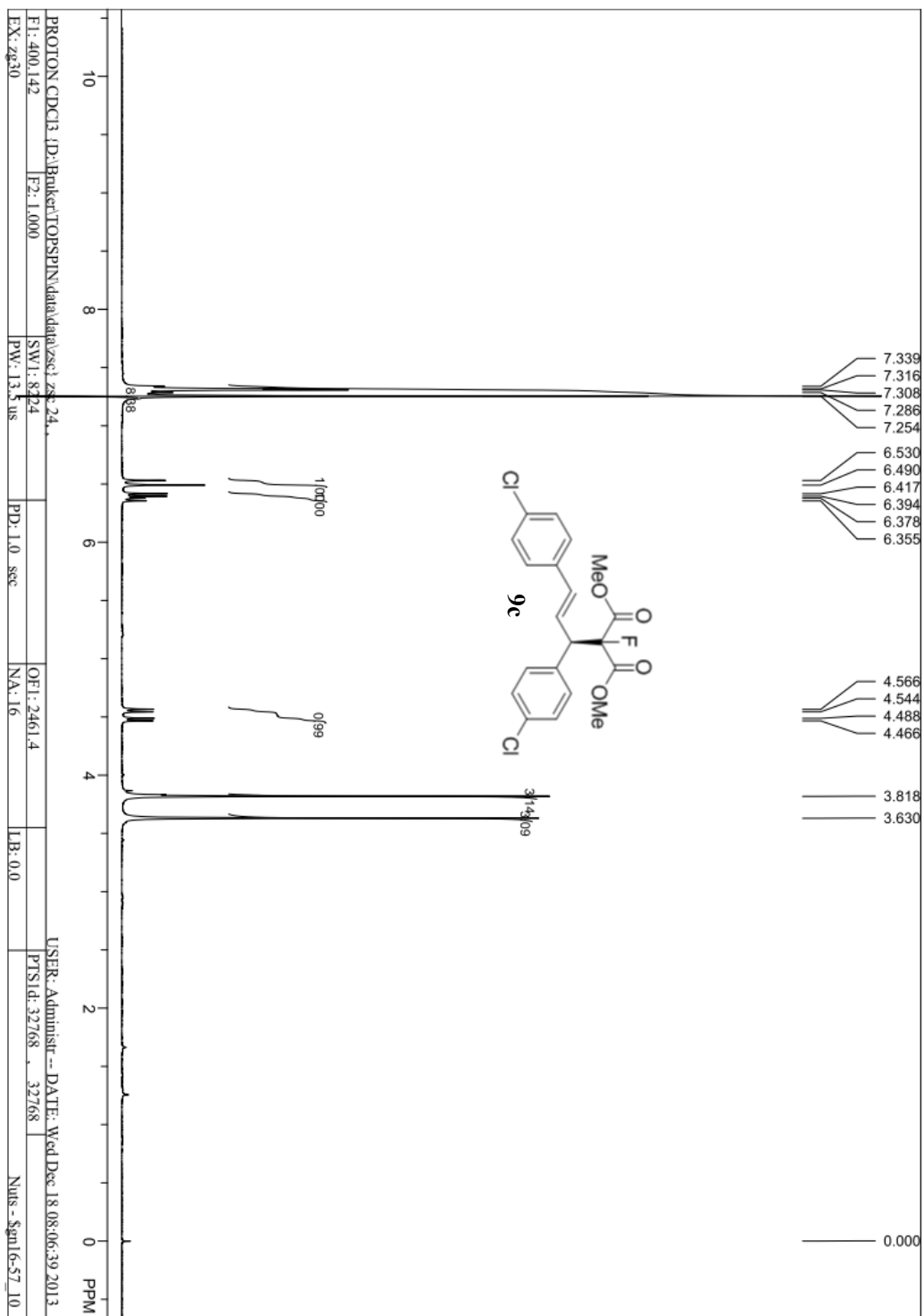


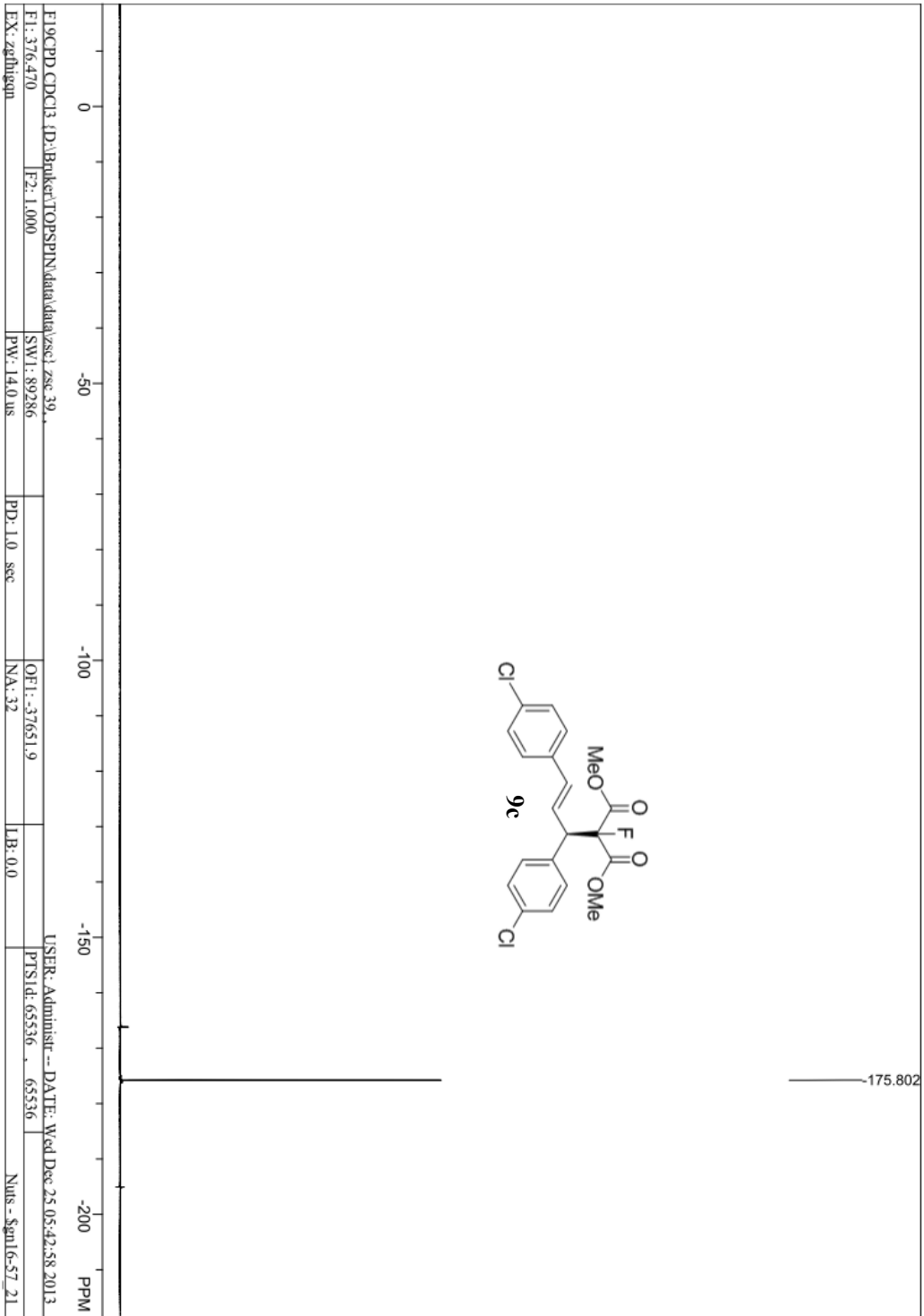


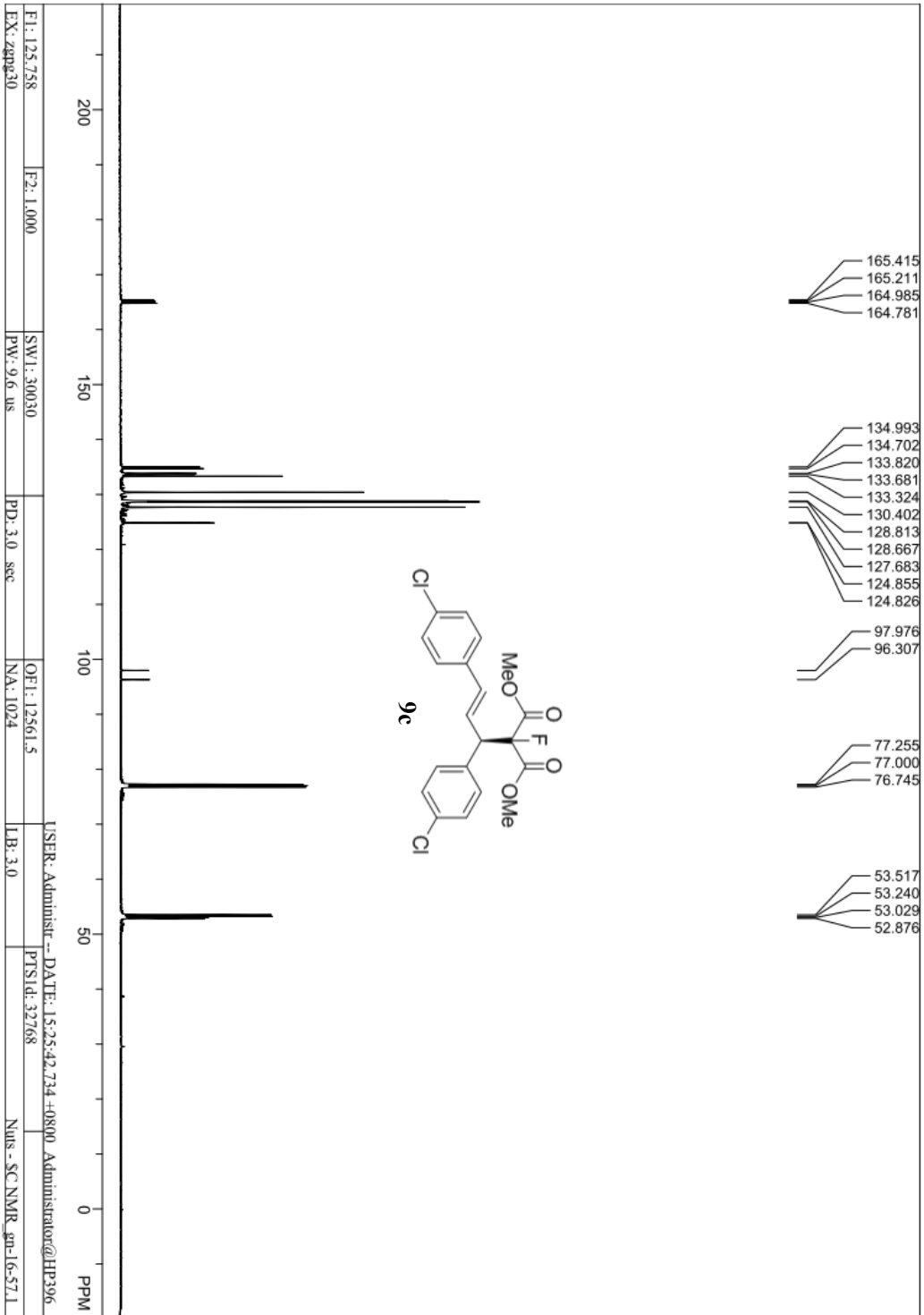


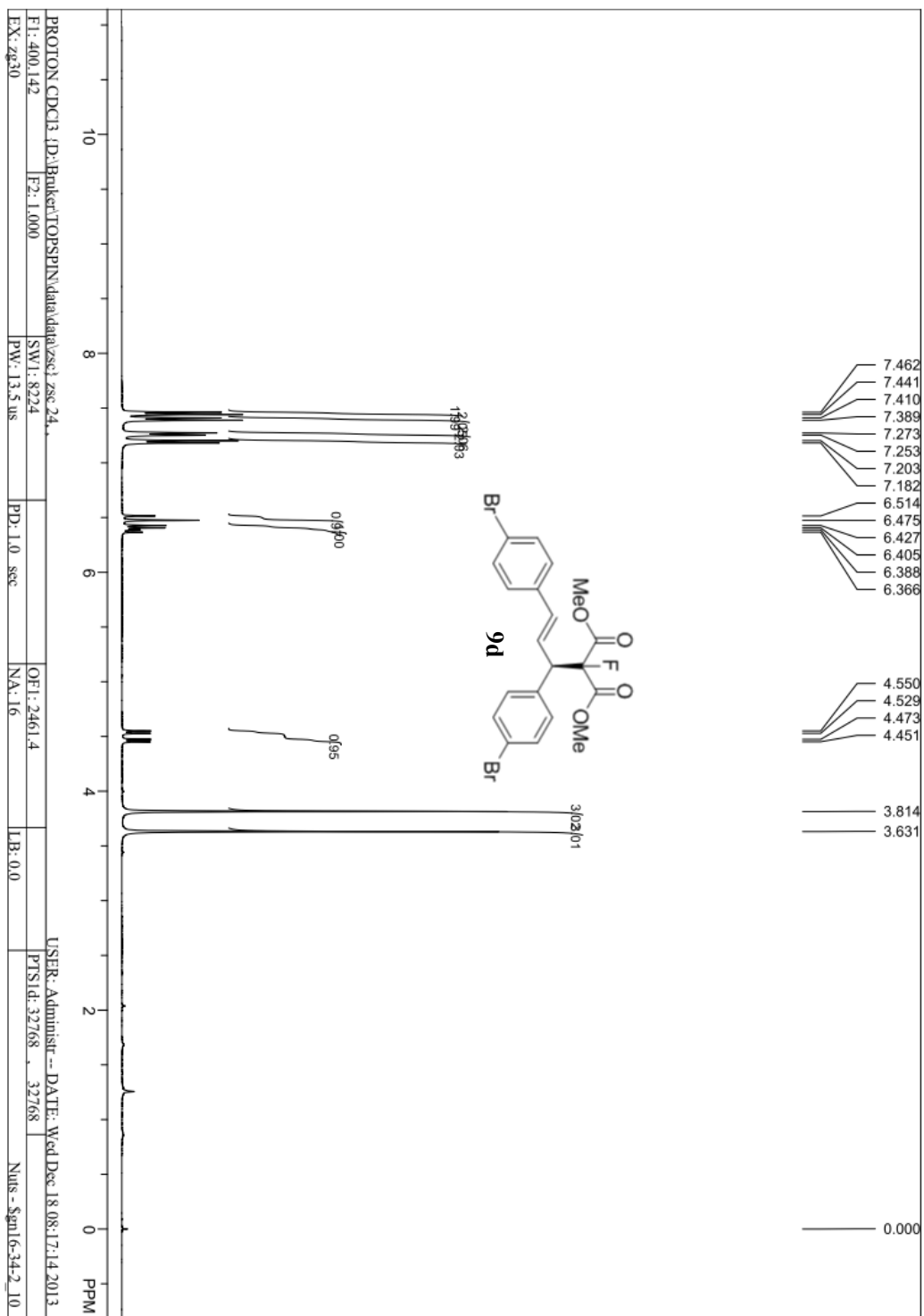


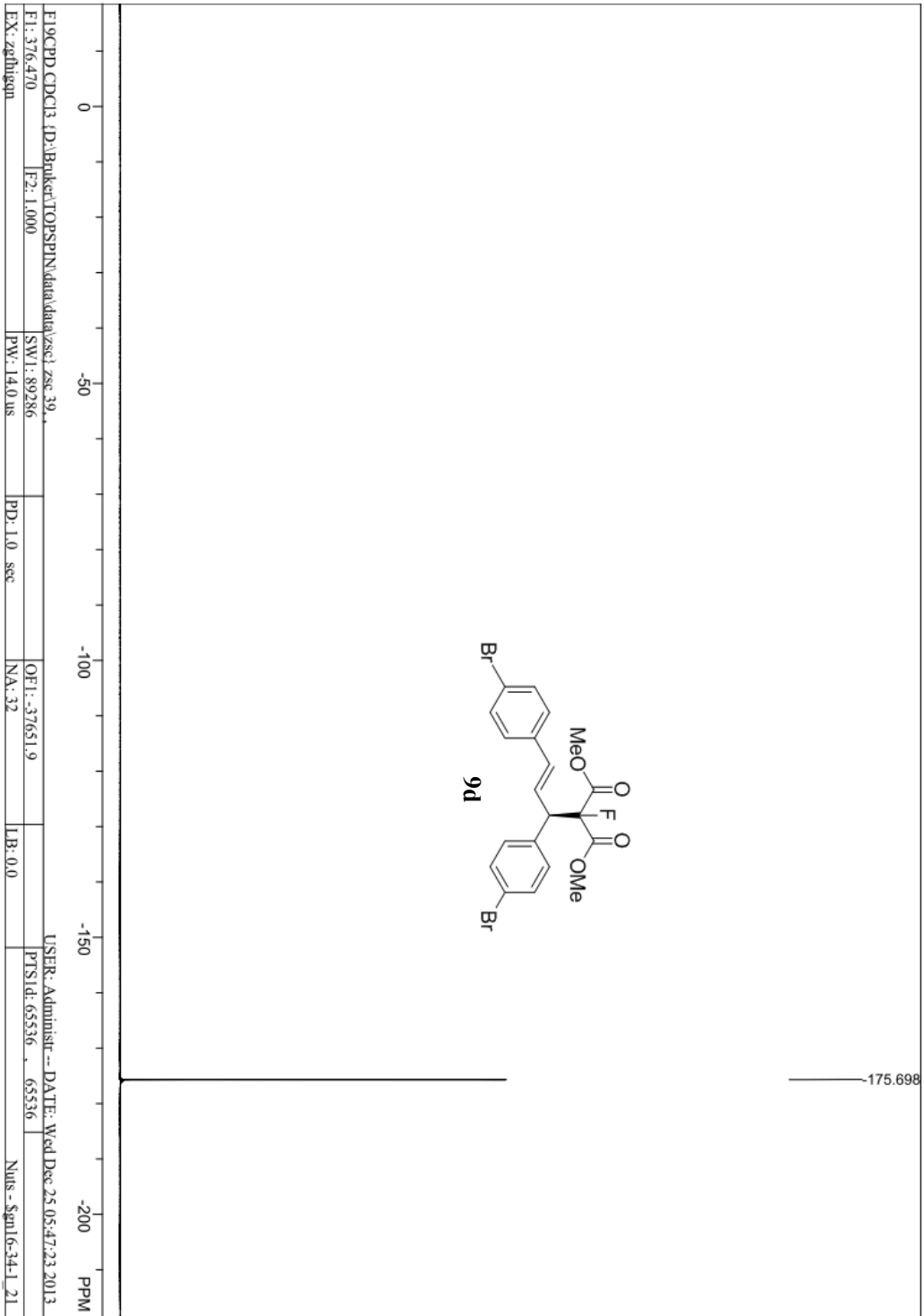


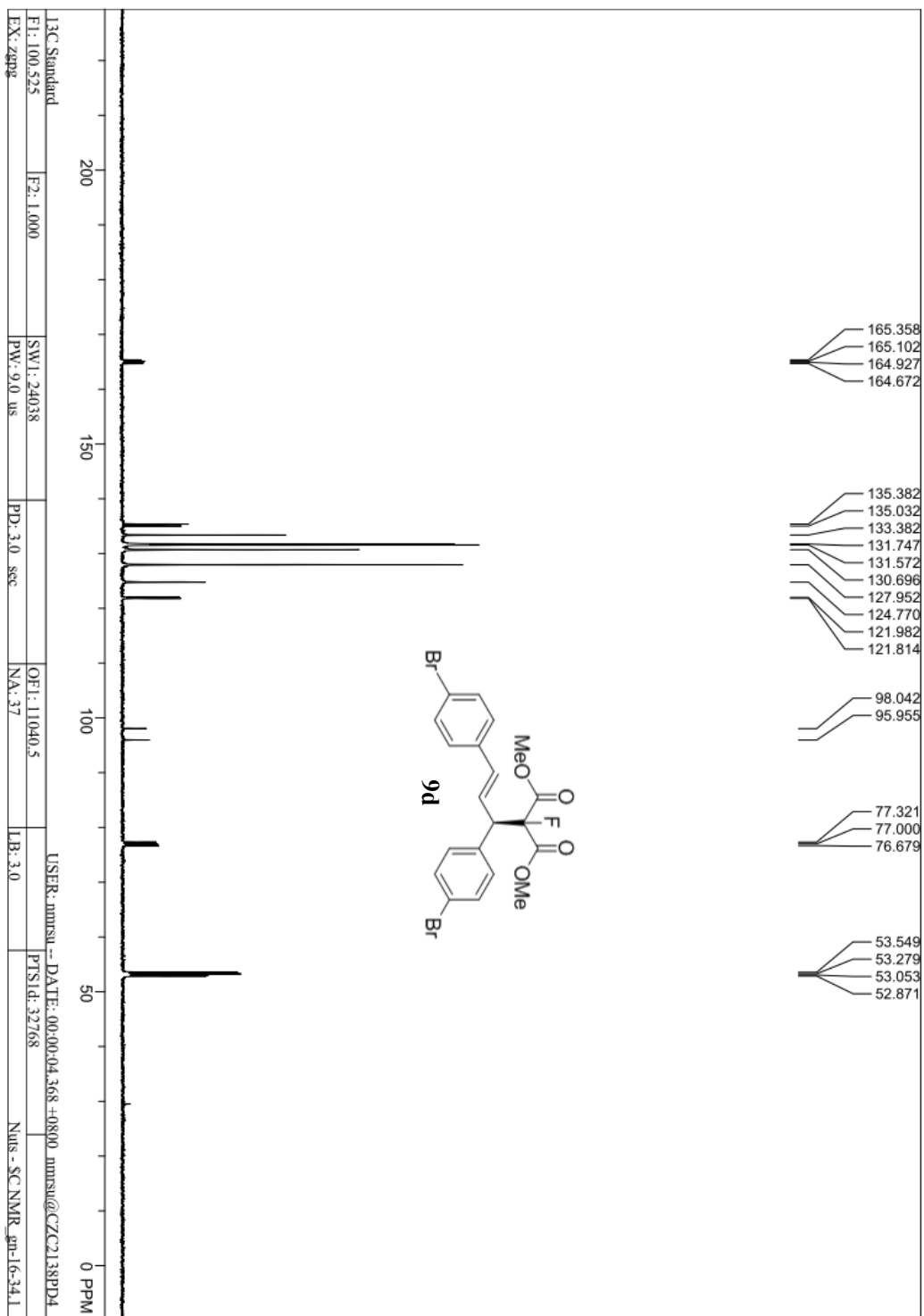


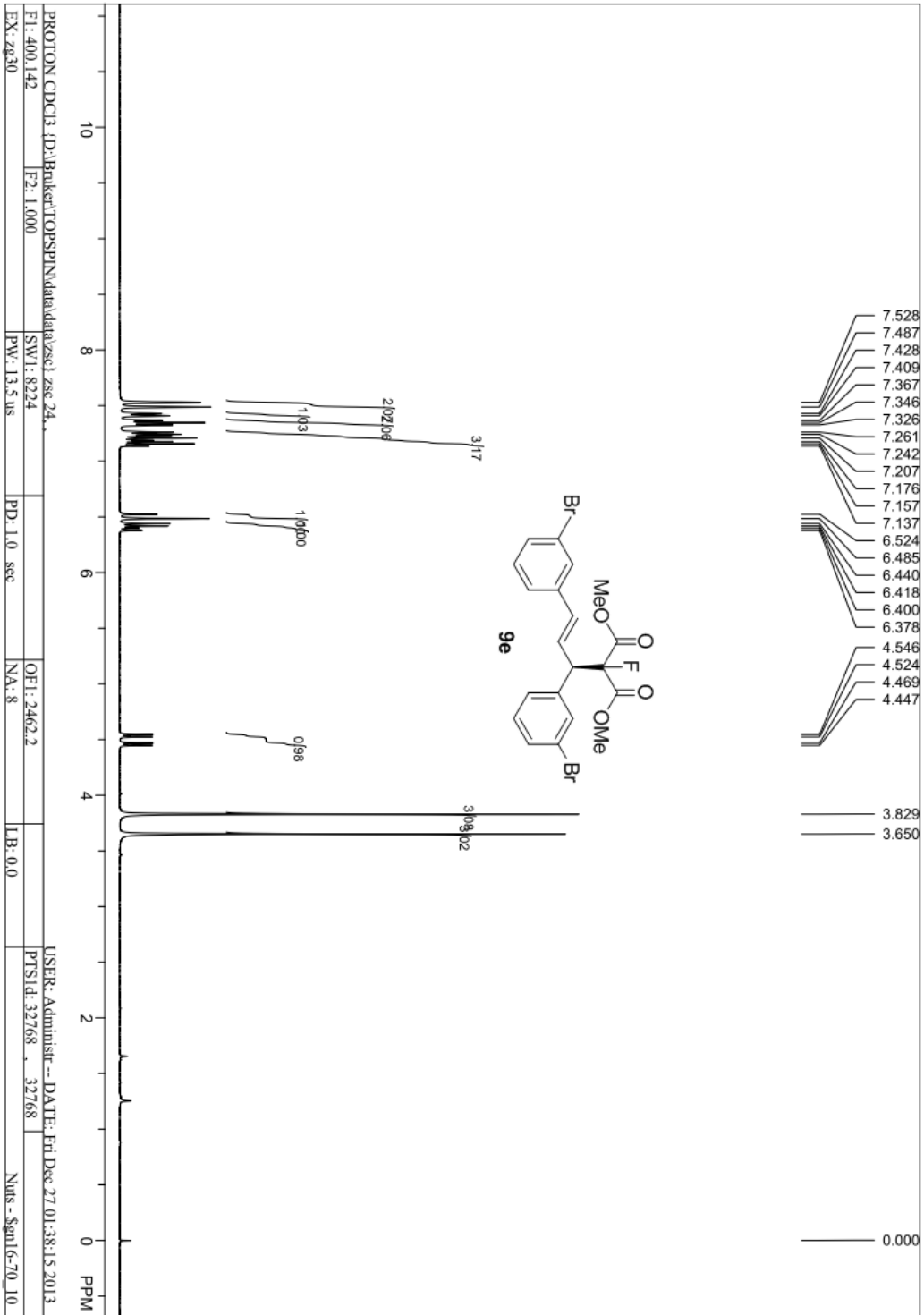


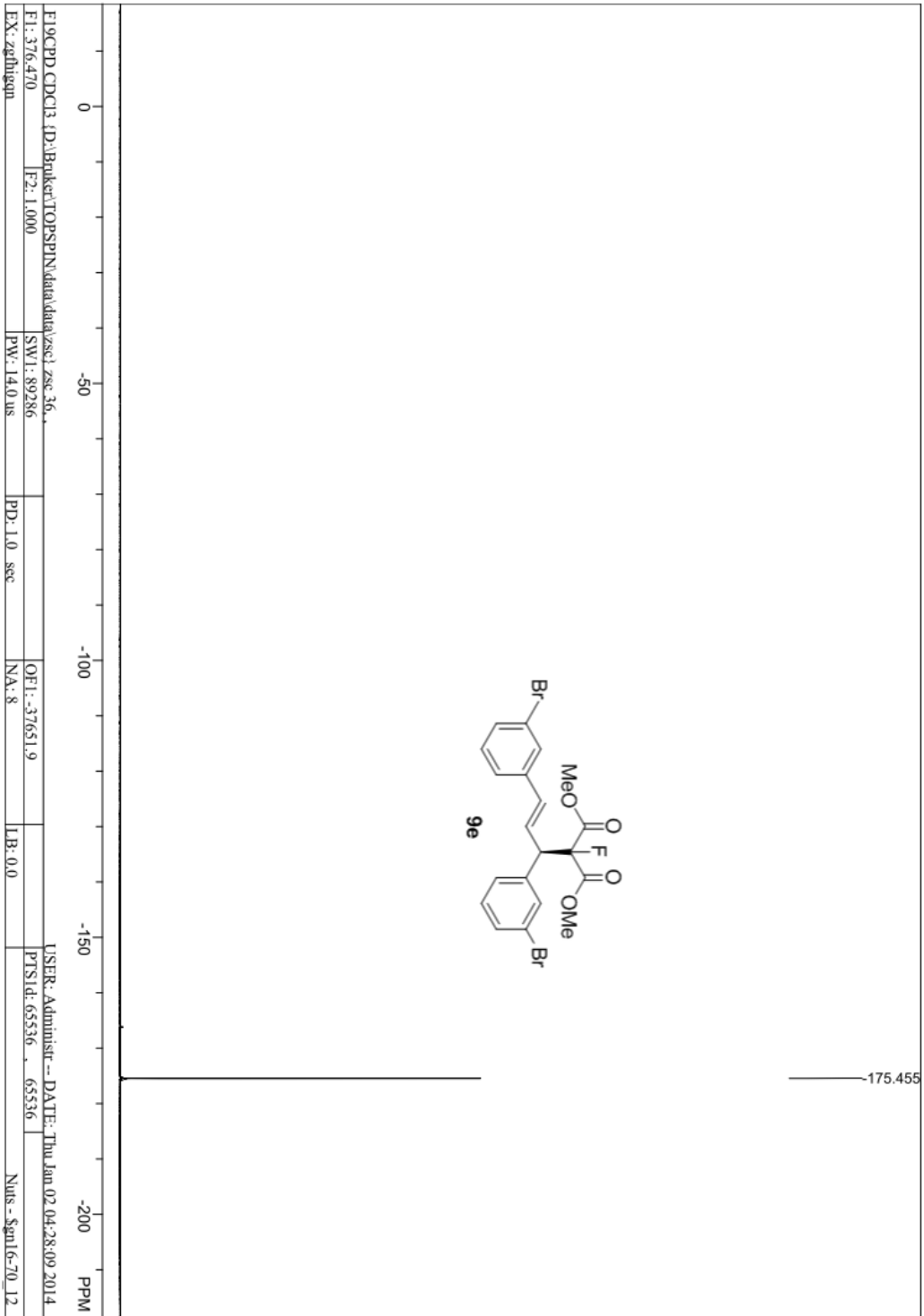


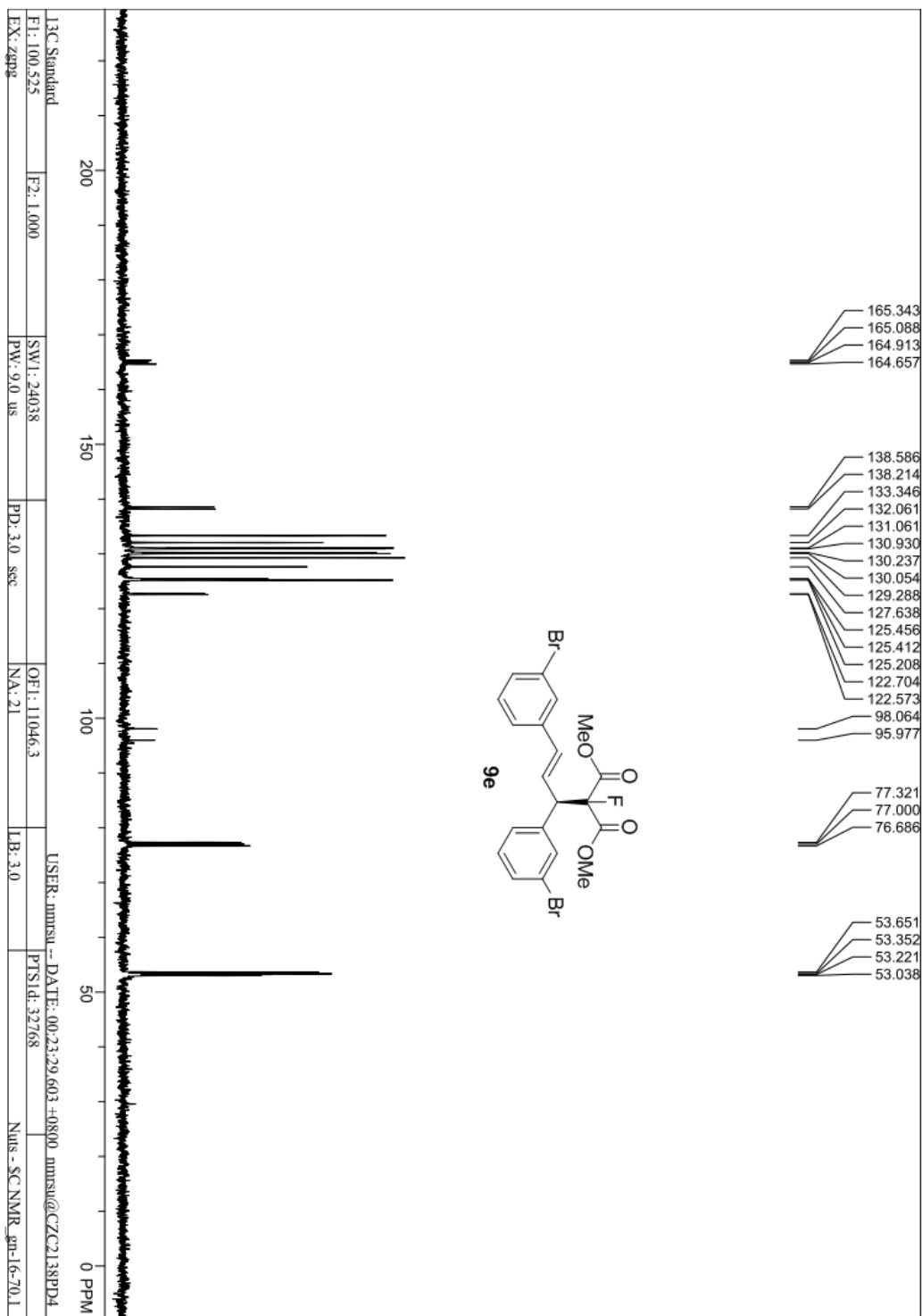


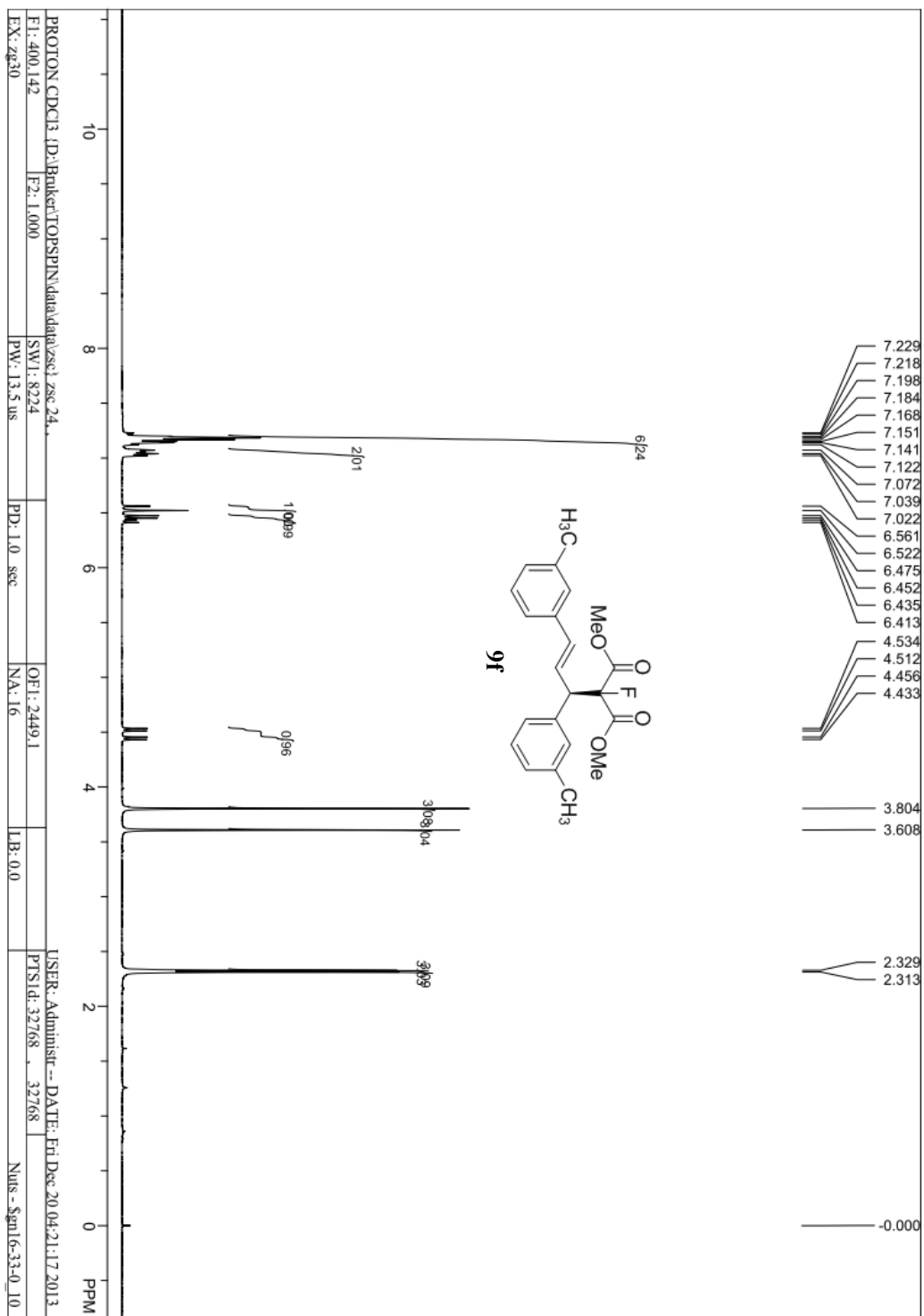


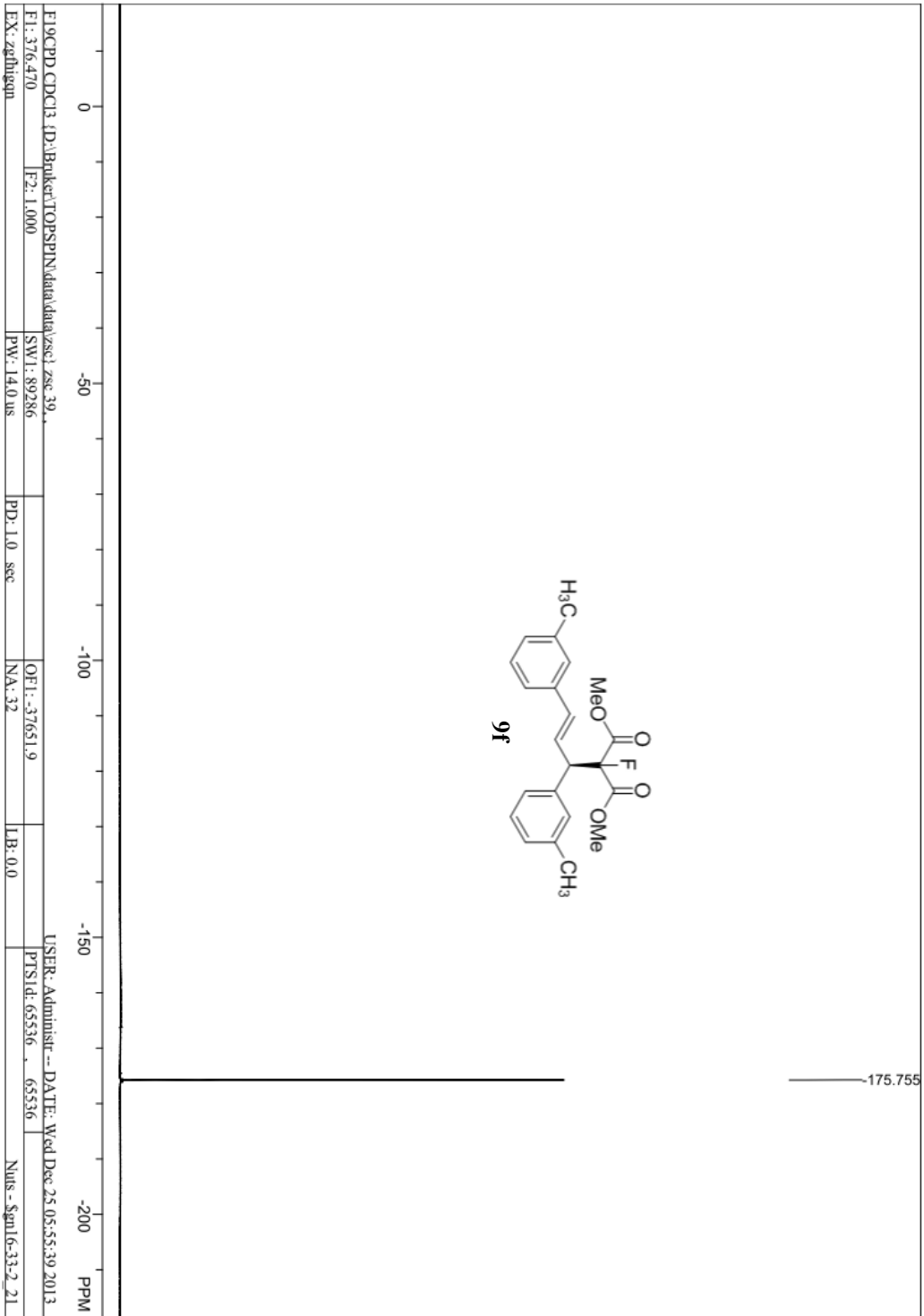


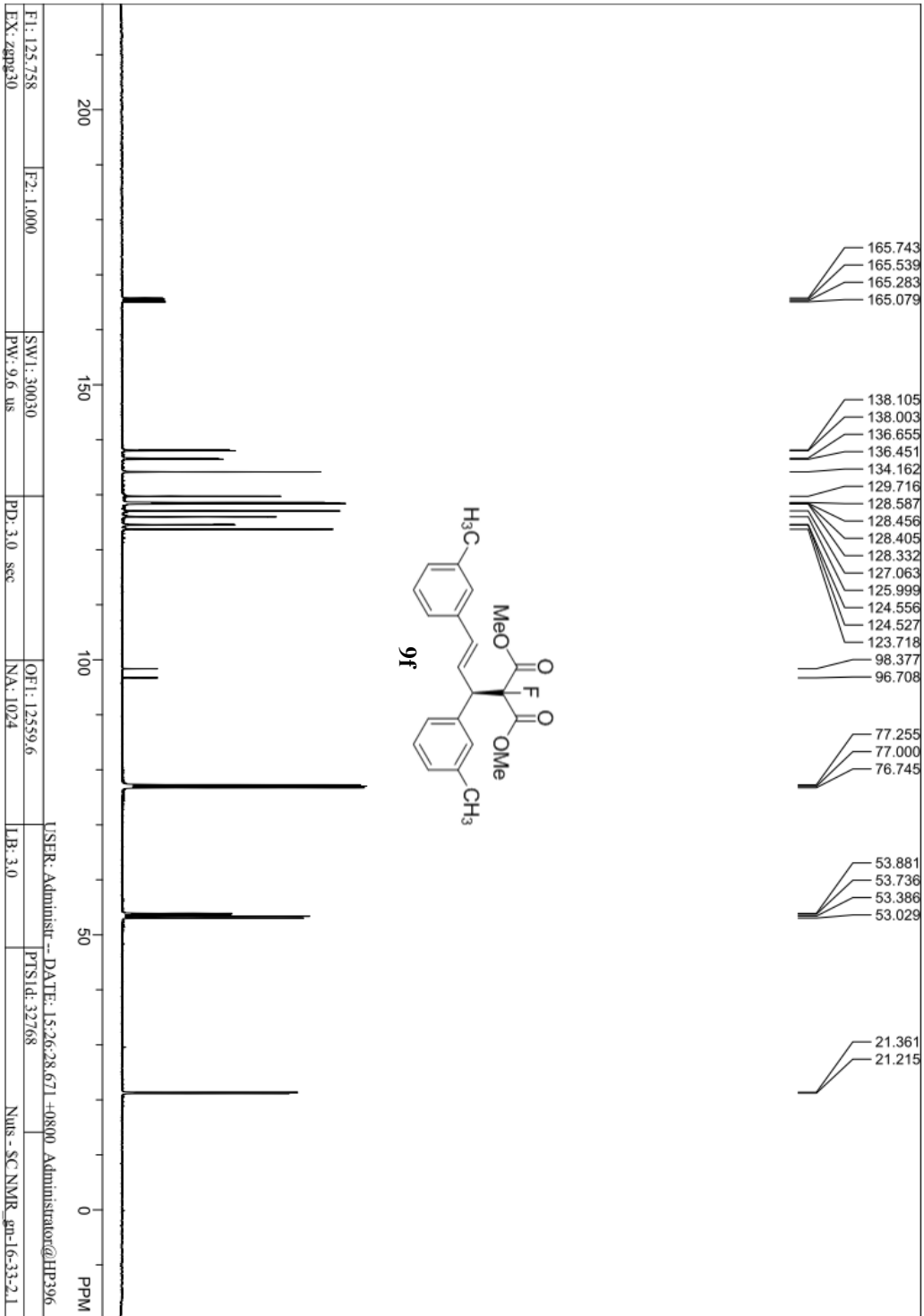


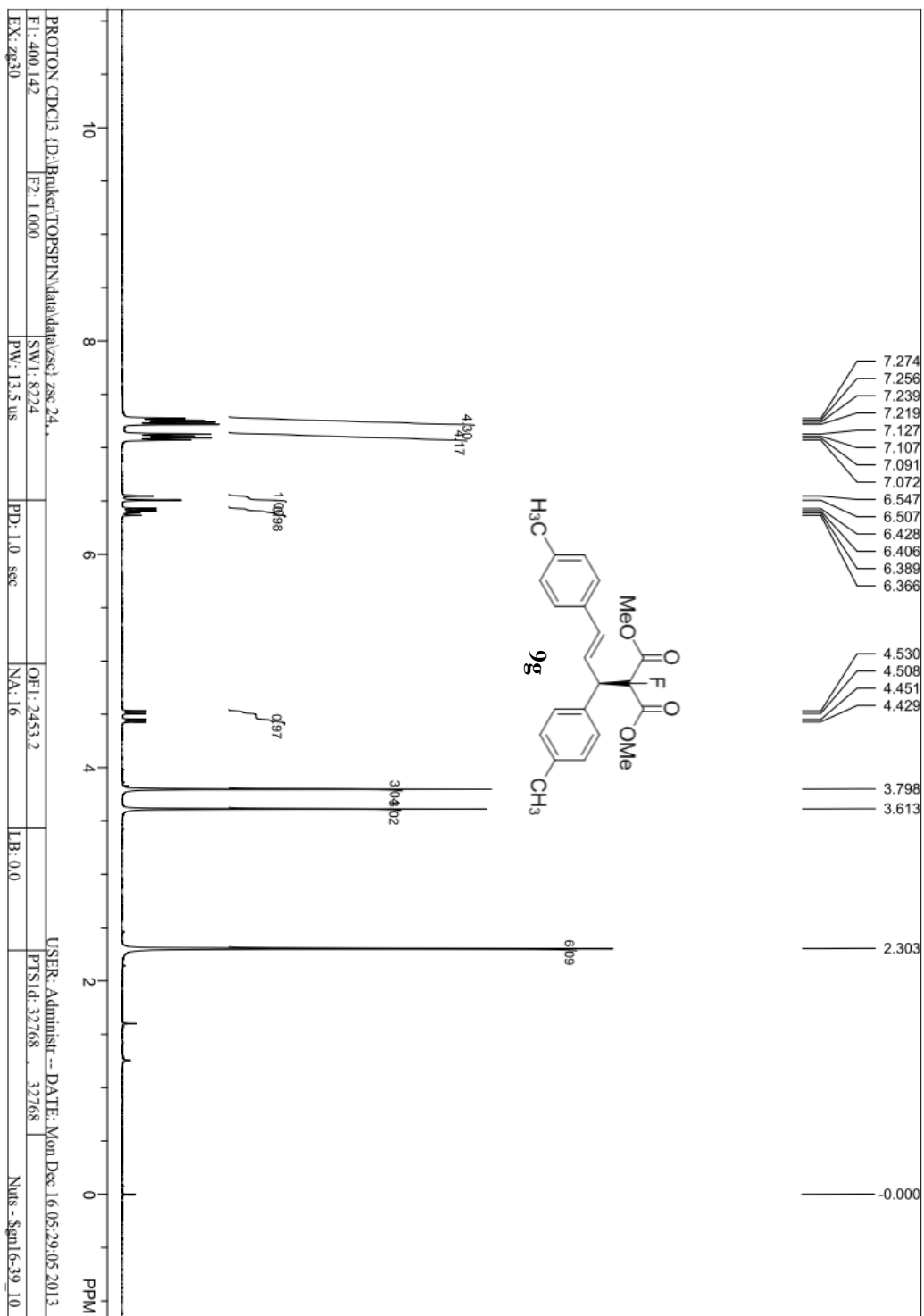


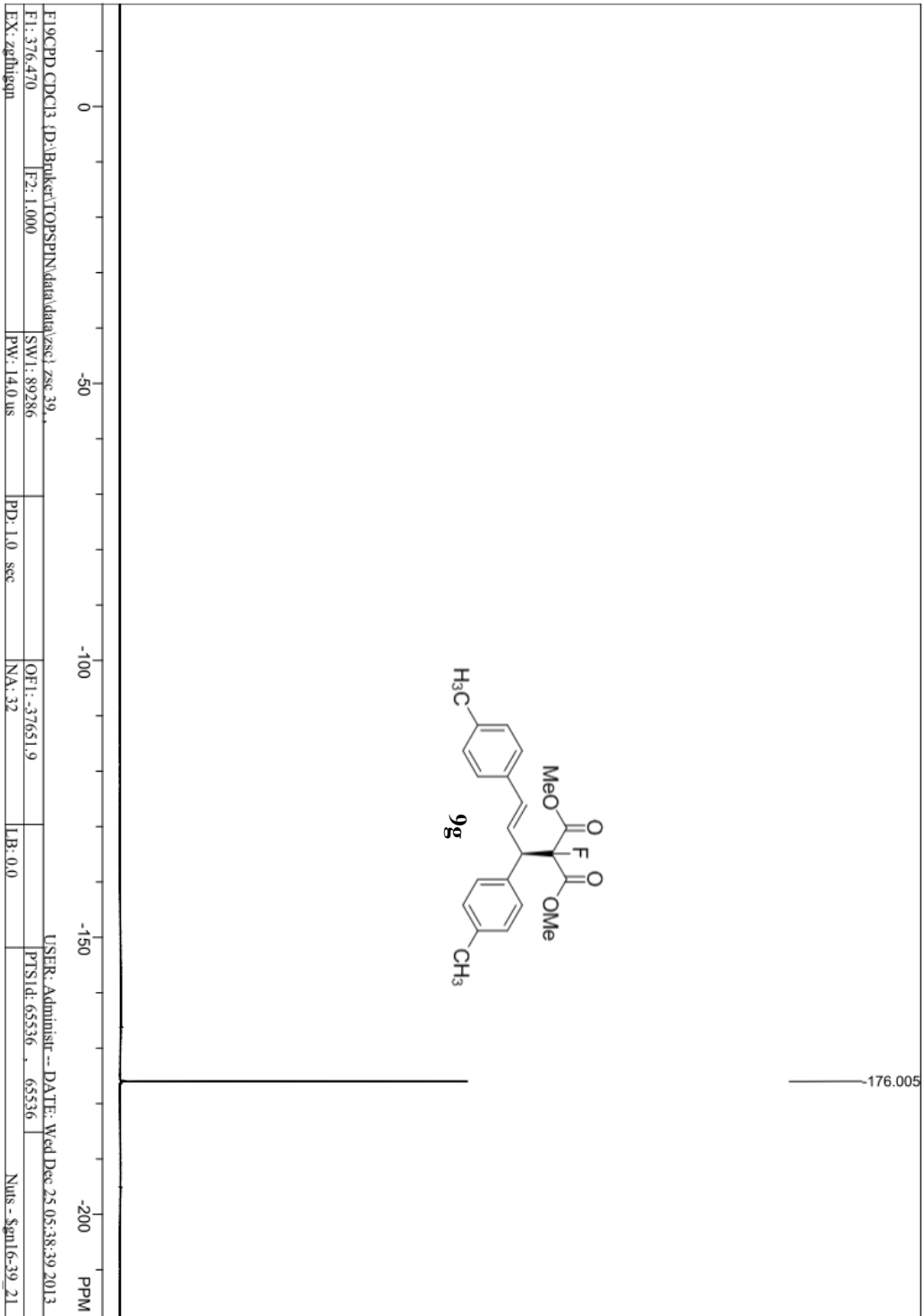


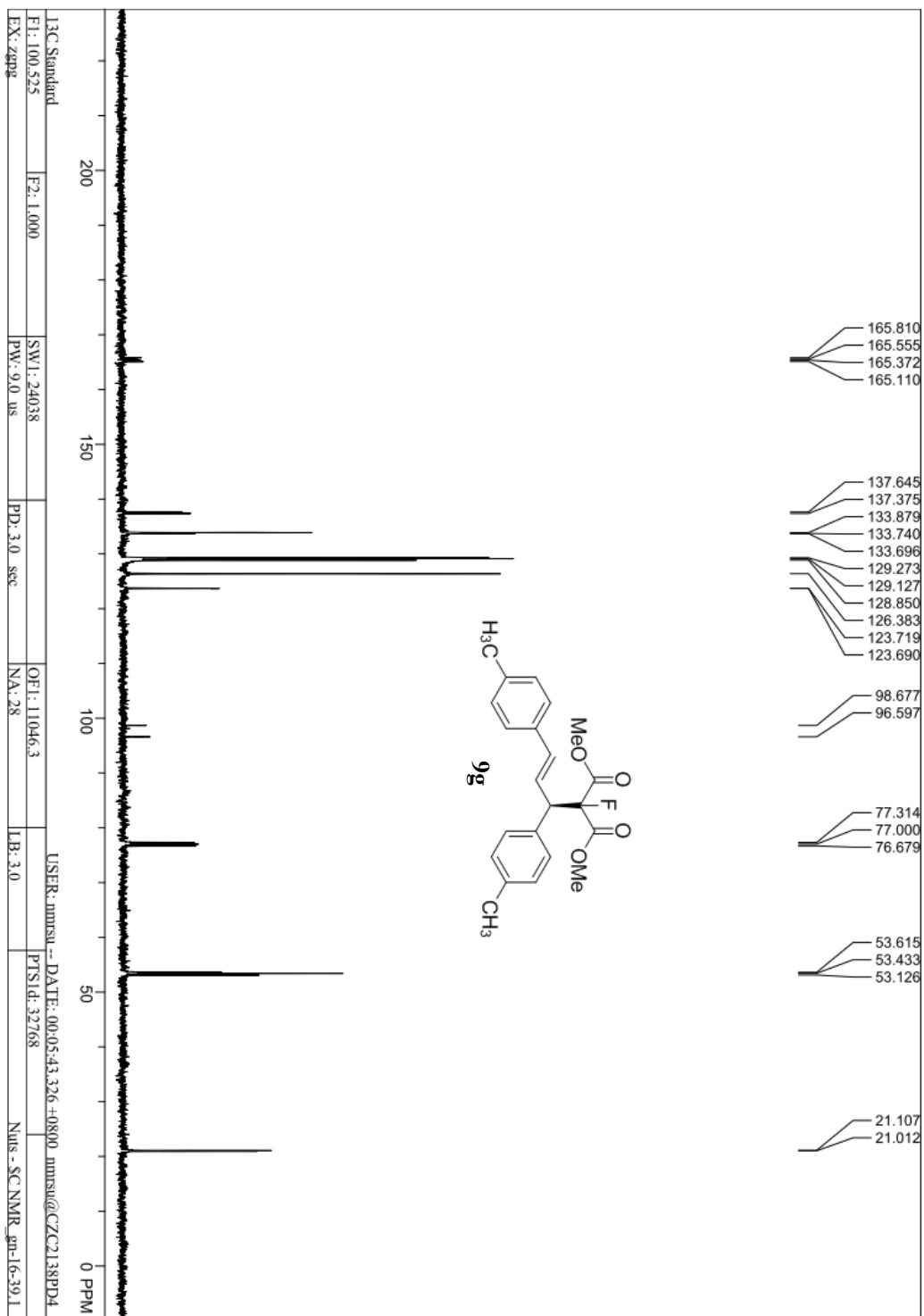


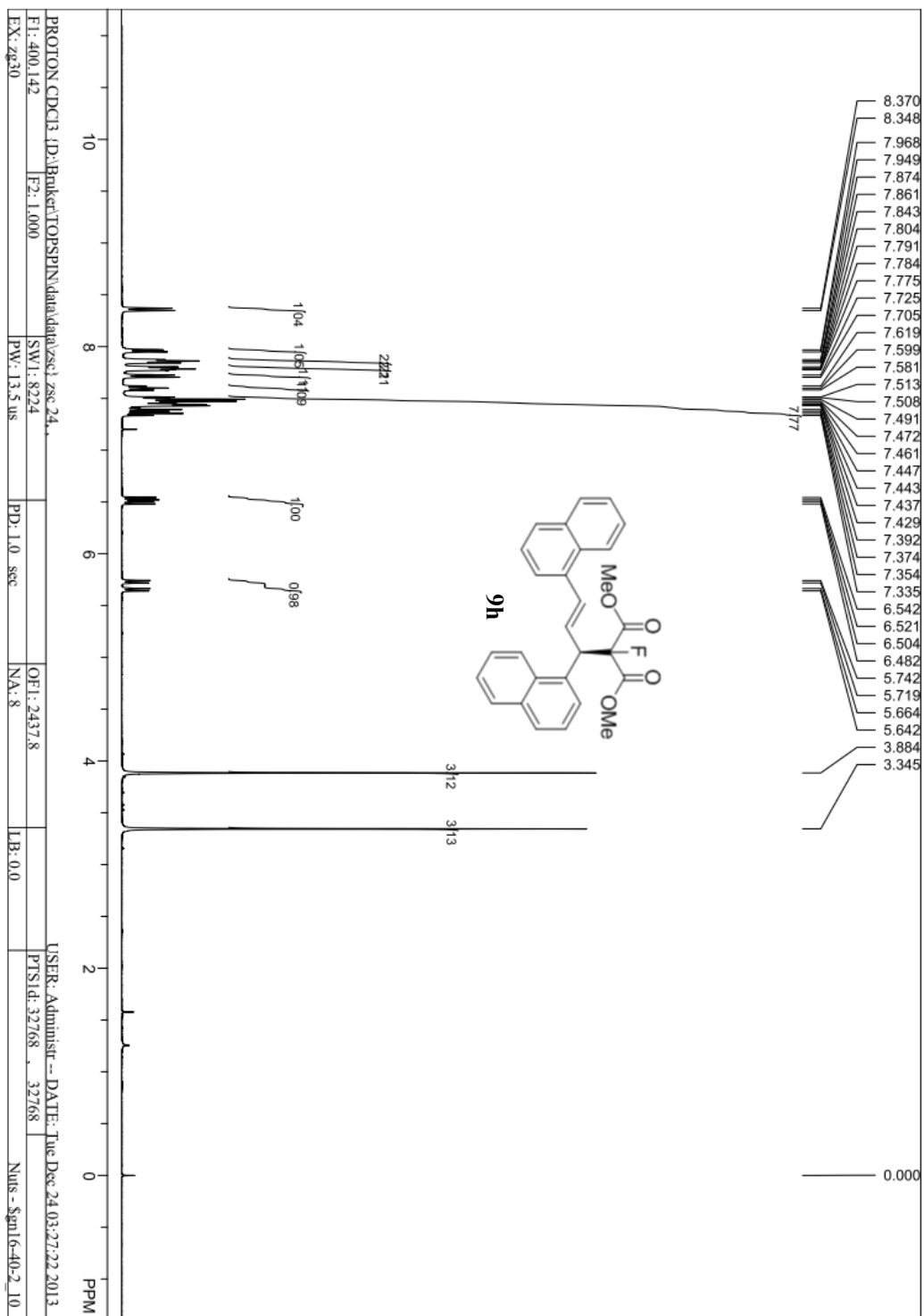


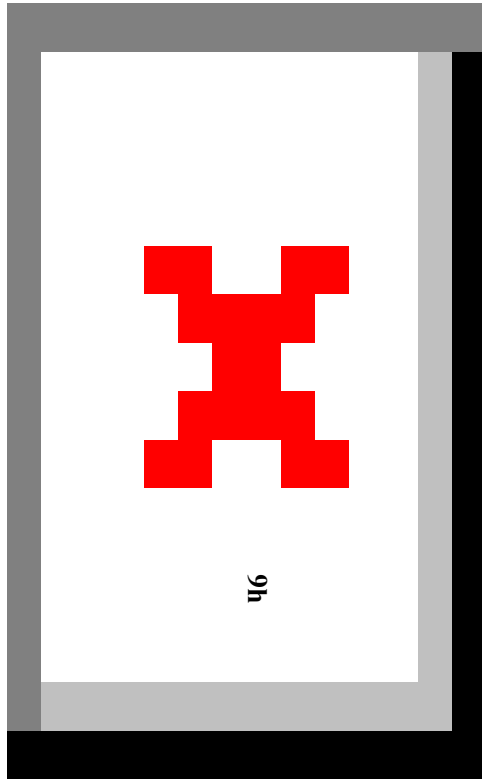


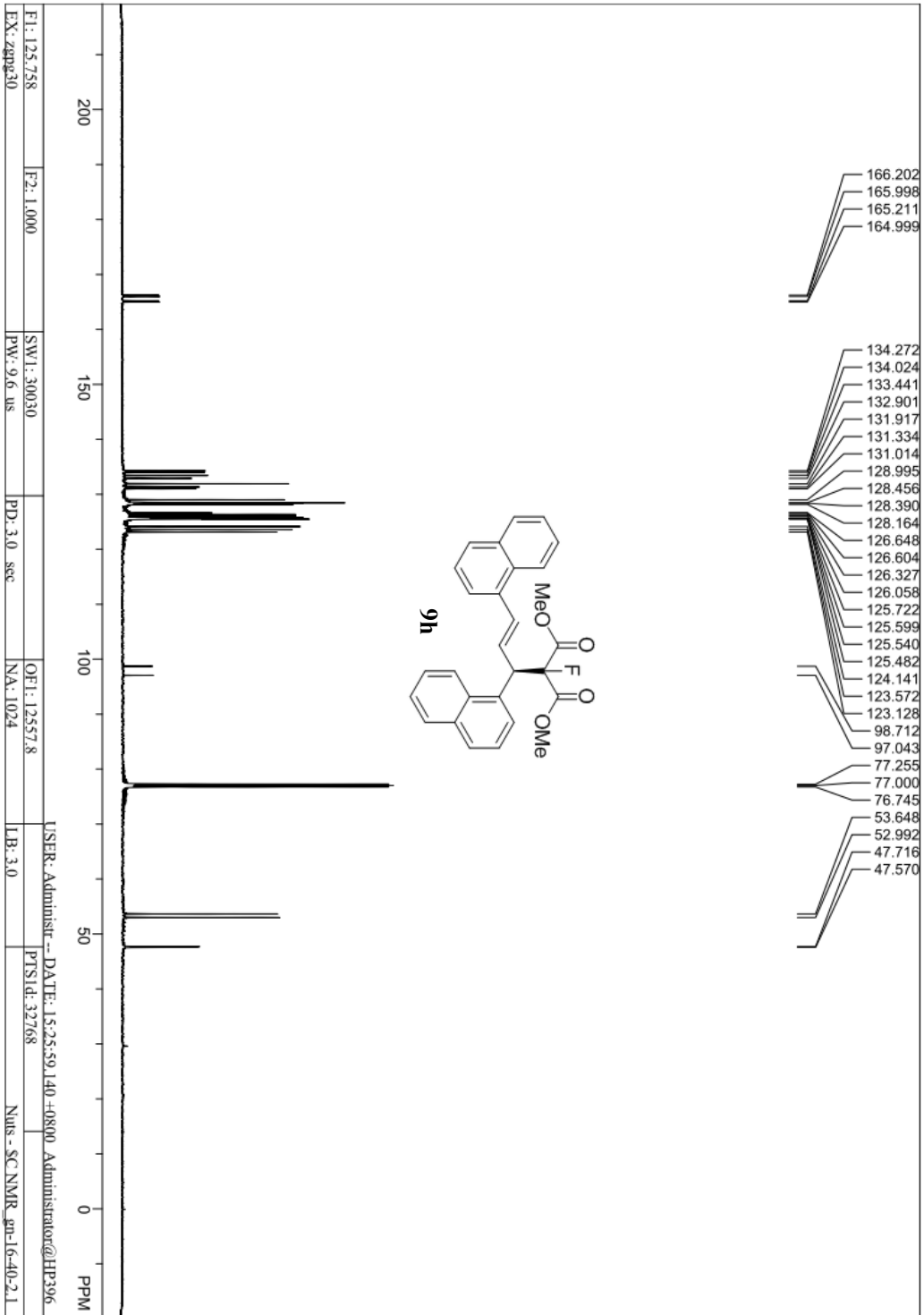


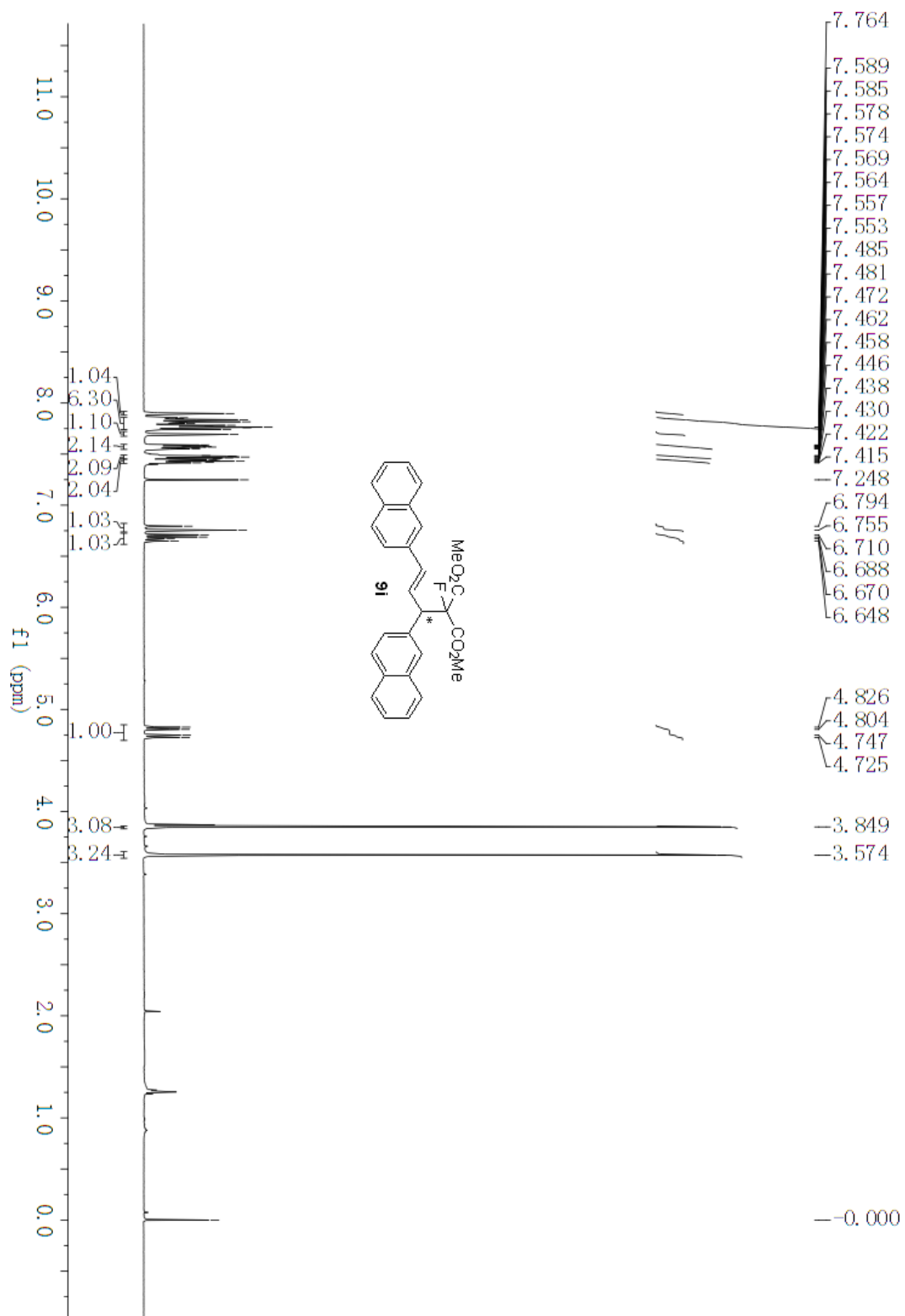


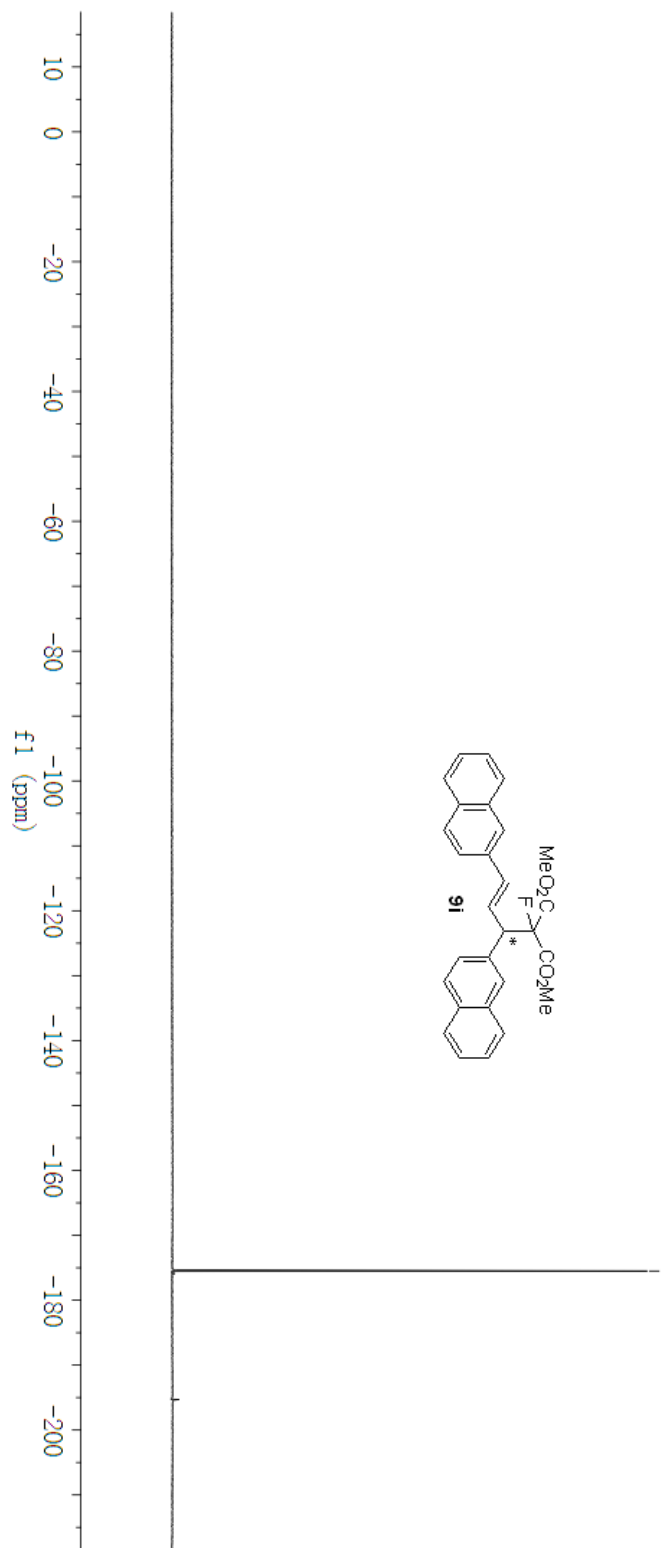




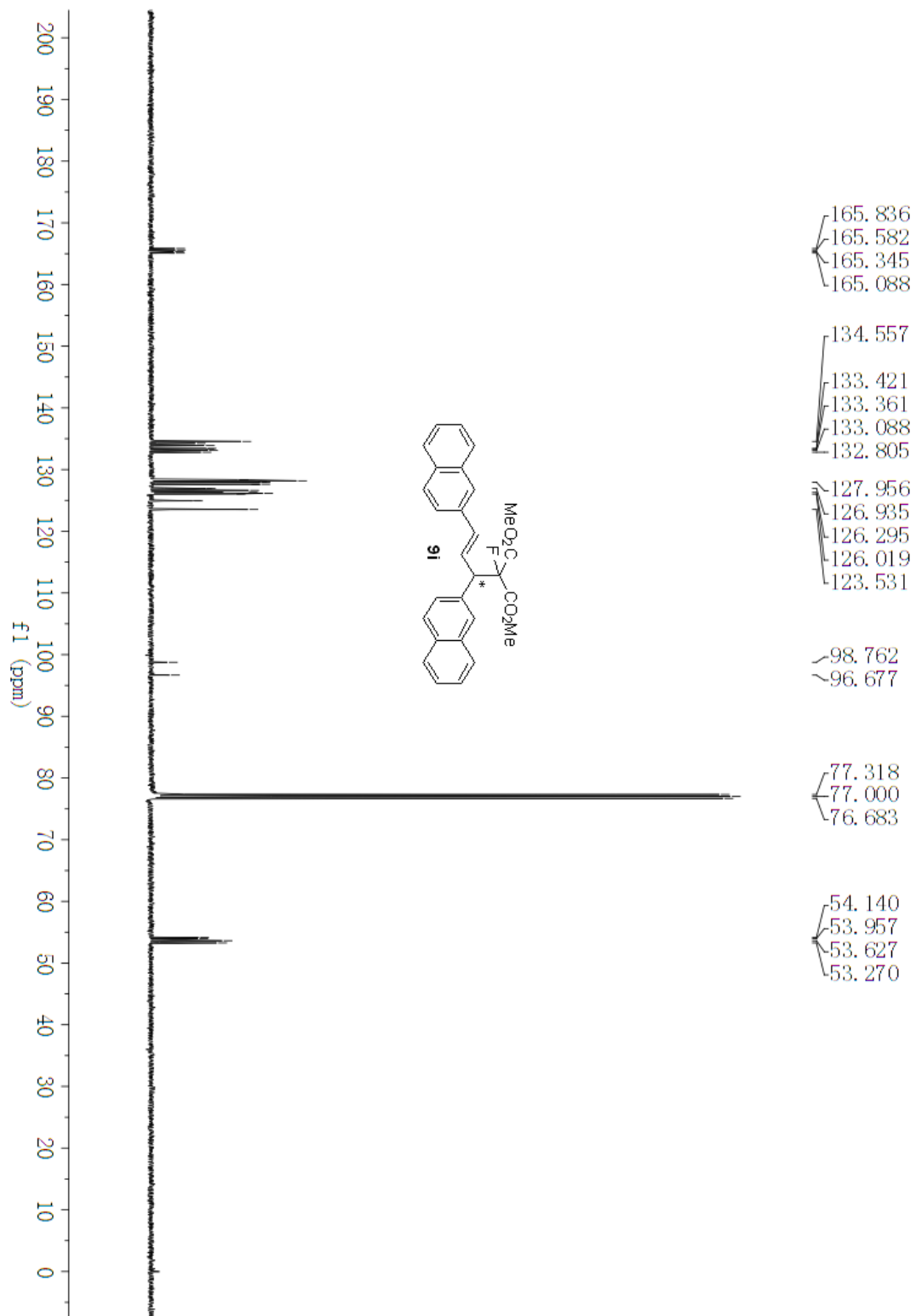




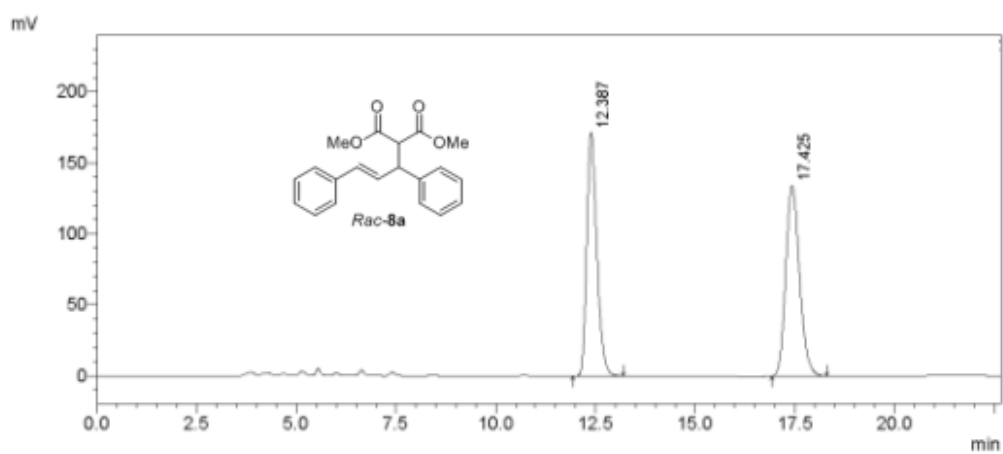




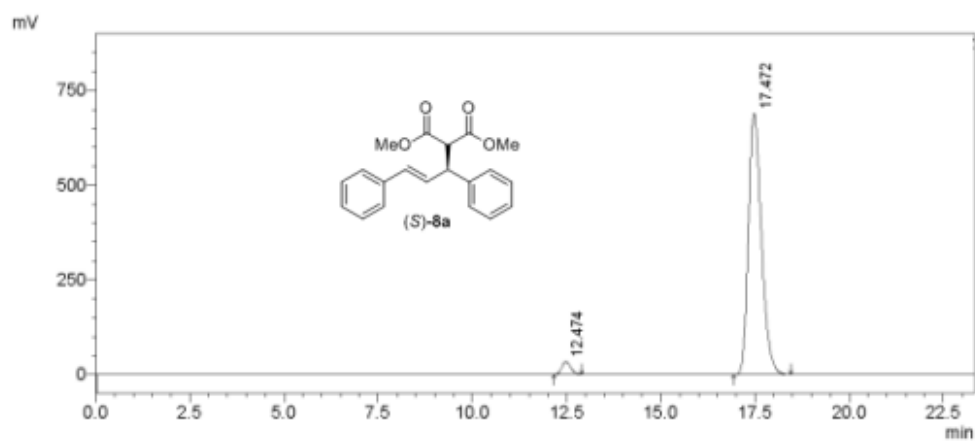
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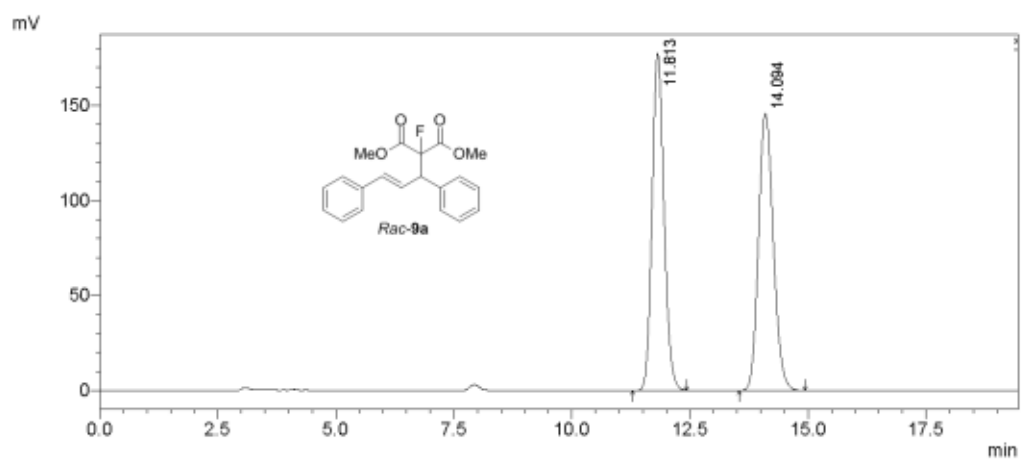
HPLC Data of Chiral Compounds



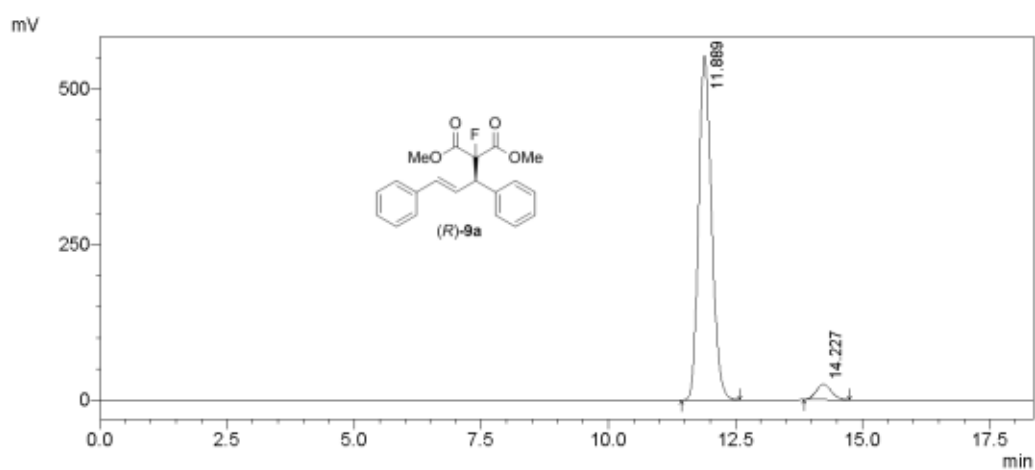
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	12.387	3013225	171687	48.393
2	17.425	3213341	134103	51.607



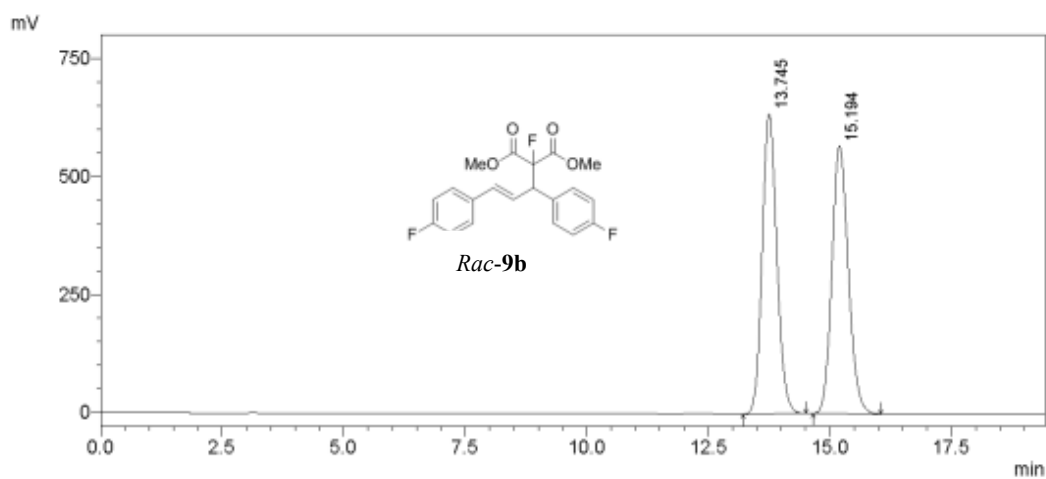
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	12.474	571641	33720	3.330
2	17.472	16594665	690079	96.670



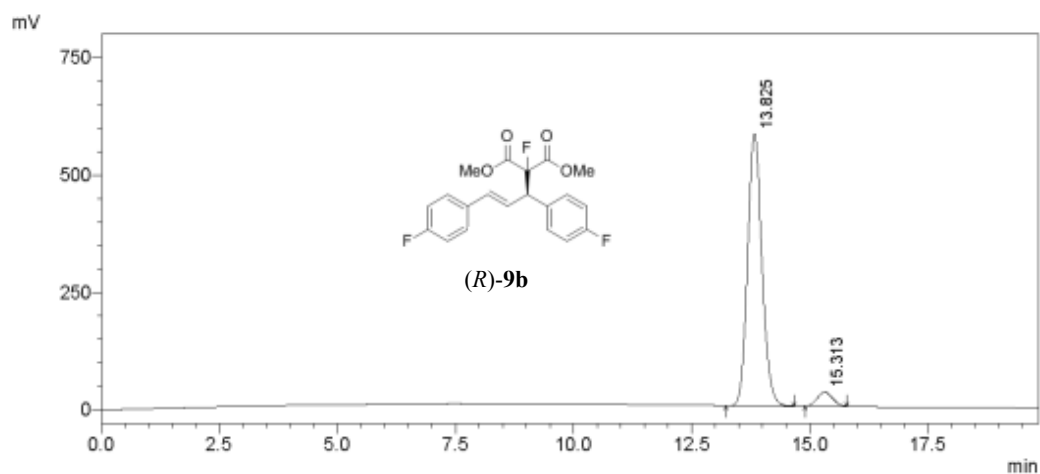
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	11.813	3137627	177191	50.079
2	14.094	3127705	145682	49.921



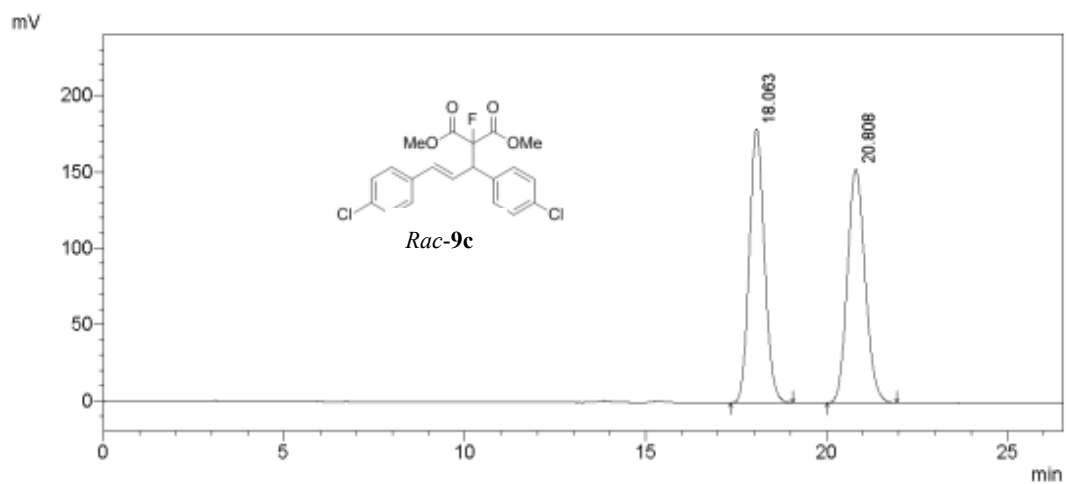
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	11.889	9857275	552669	95.064
2	14.227	511862	24669	4.936



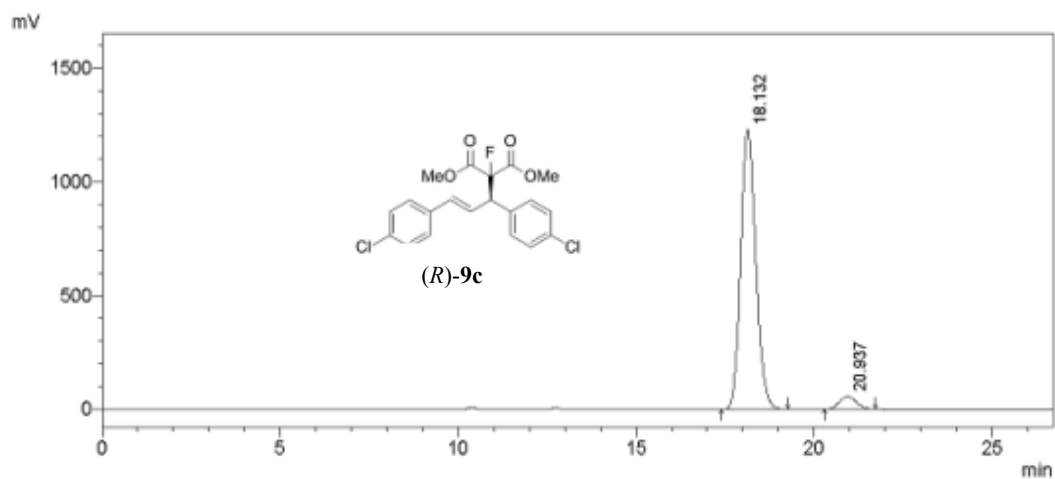
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	13.745	13332244	635460	50.018
2	15.194	13322495	566499	49.982



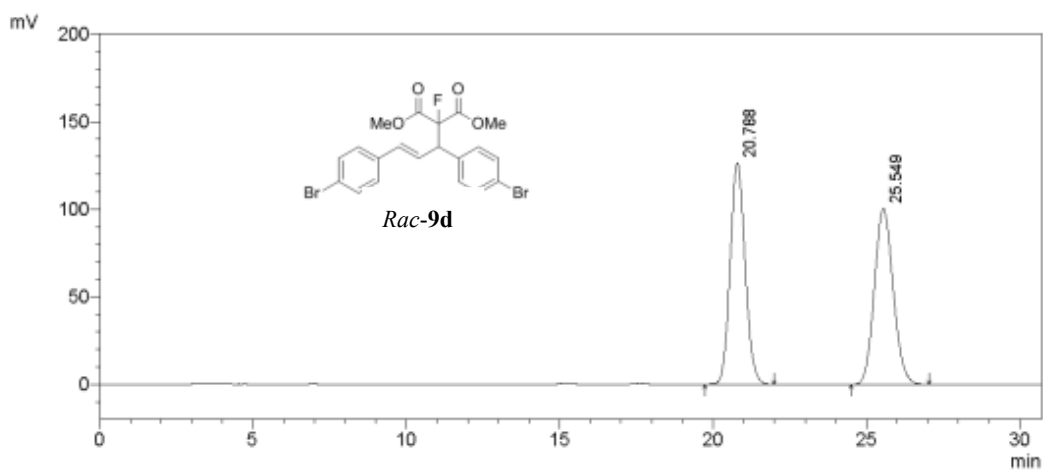
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	13.825	12276980	579140	94.813
2	15.313	671610	29832	5.187



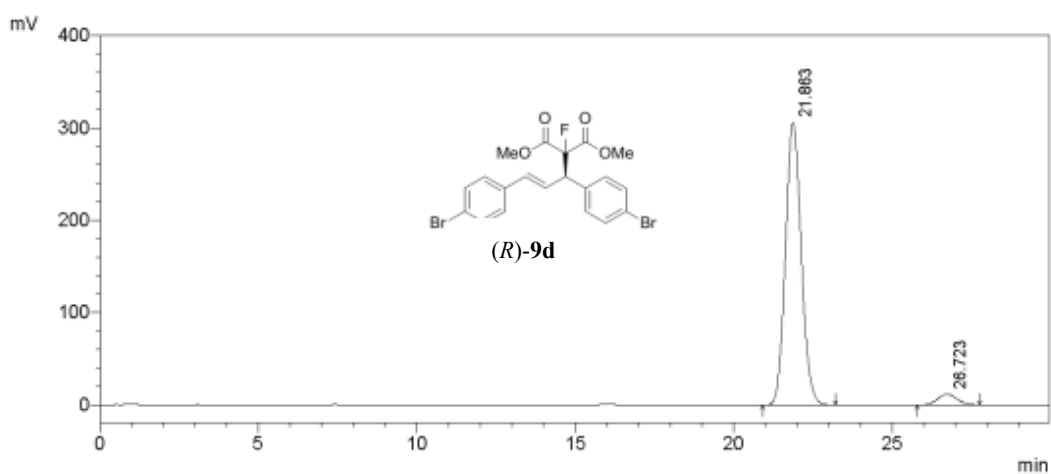
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	18.063	5212507	179359	50.014
2	20.808	5209597	153115	49.986



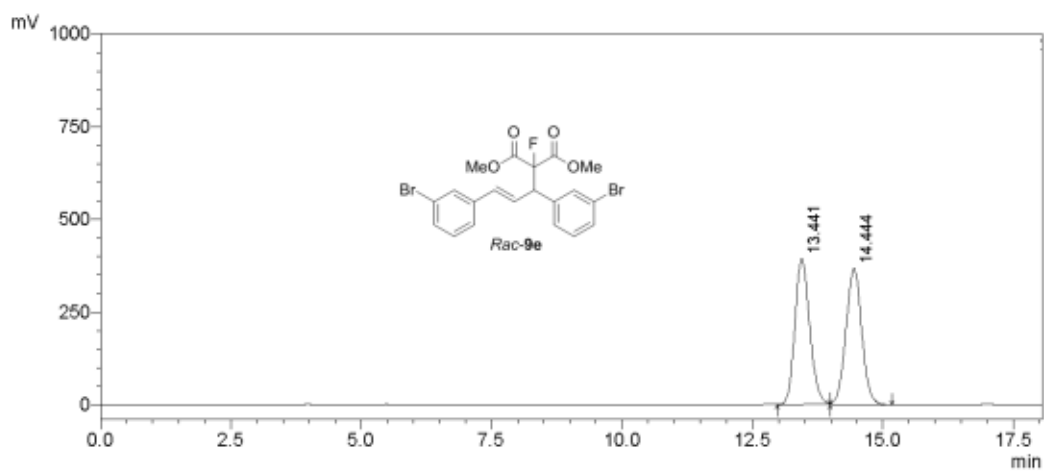
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	18.132	36365539	1230040	95.048
2	20.937	1894791	56511	4.952



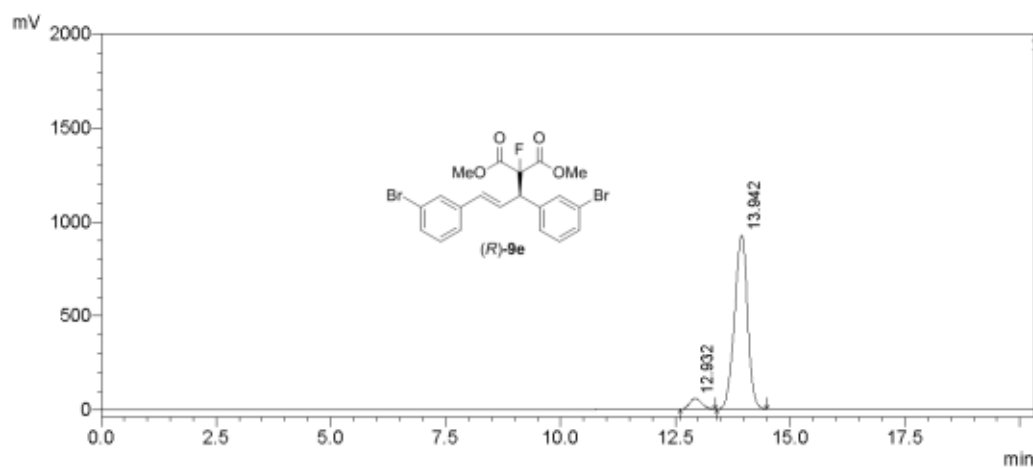
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	20.788	4308362	126601	49.991
2	25.549	4309905	100484	50.009



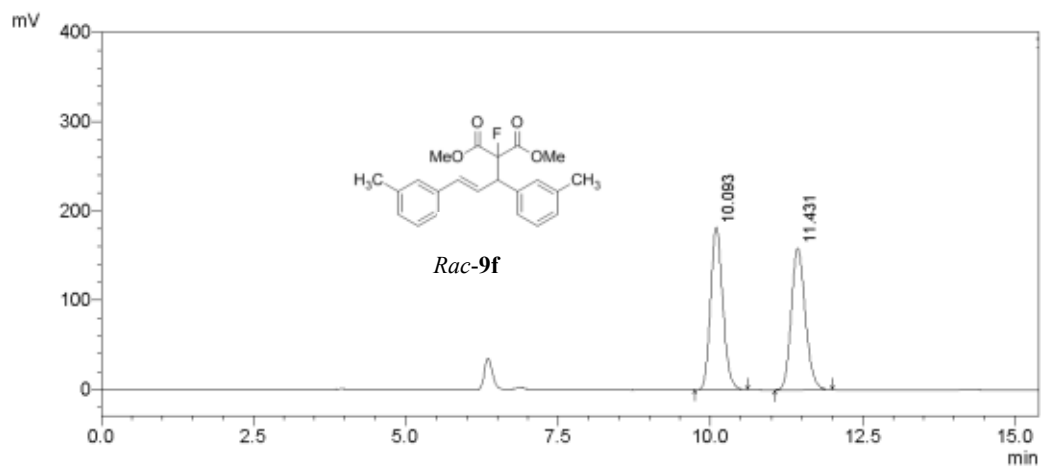
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	21.863	10626744	305993	95.561
2	26.723	493594	11634	4.439



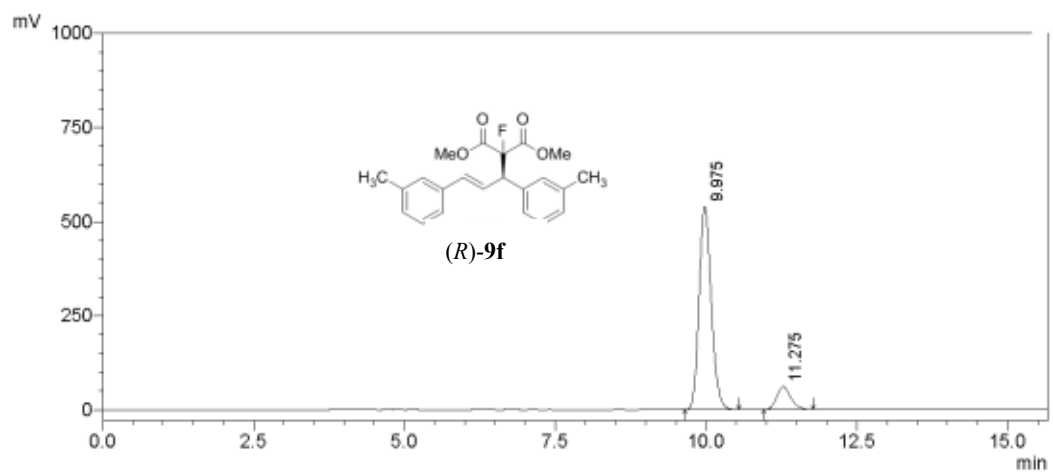
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	13.441	7768268	392619	49.928
2	14.444	7790613	367689	50.072



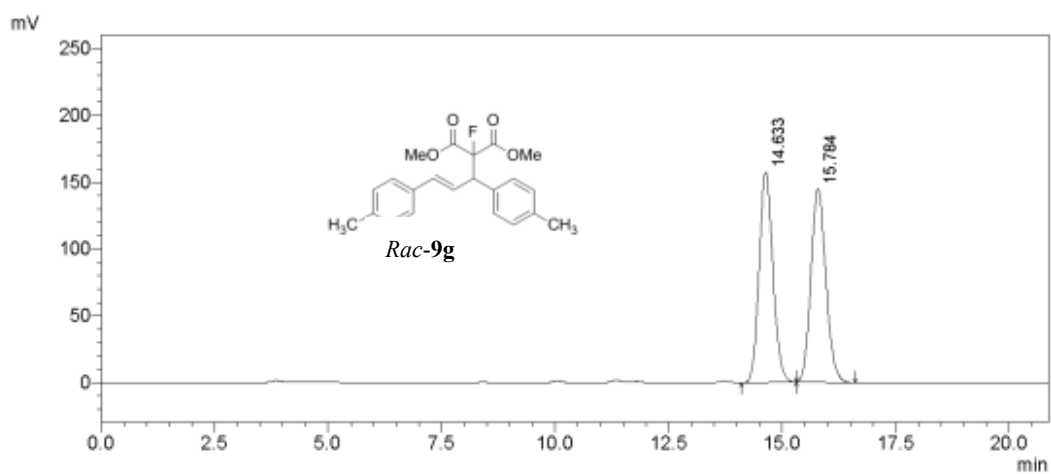
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	12.932	1004267	56682	5.229
2	13.842	18203105	926060	94.771



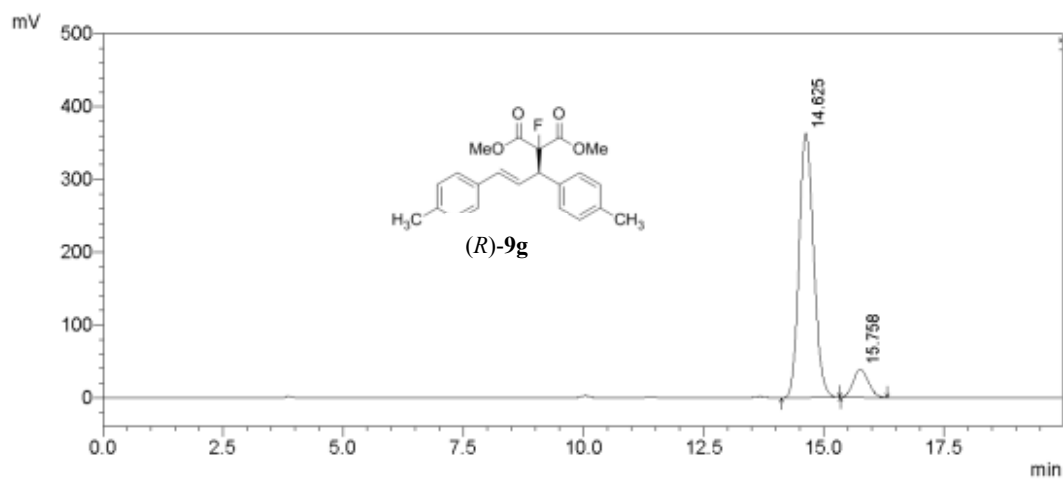
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	10.093	2542849	181945	49.873
2	11.431	2555844	158923	50.127



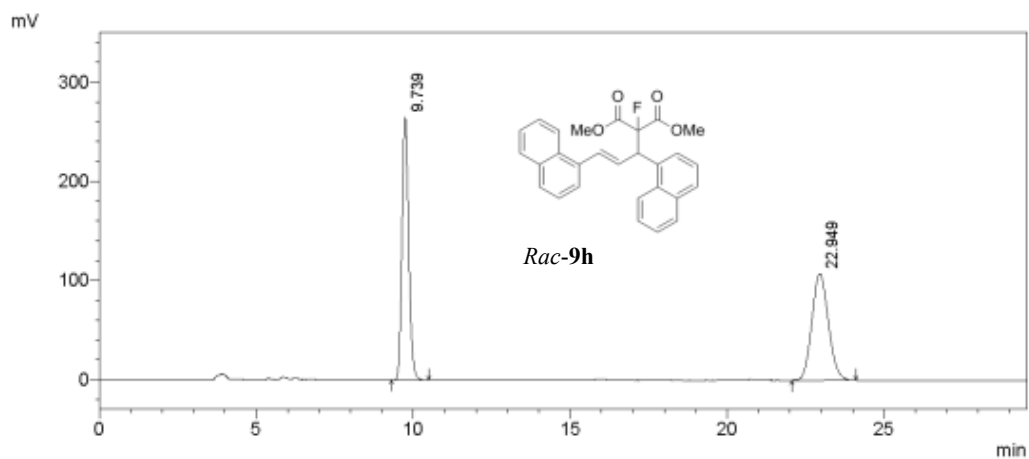
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	9.975	7516978	538786	88.514
2	11.275	975471	60245	11.486



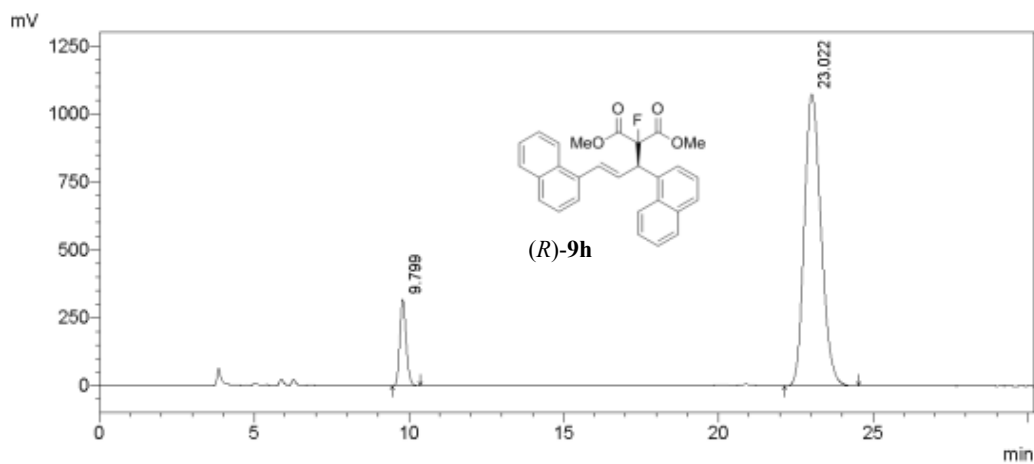
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	14.633	3324910	157558	49.953
2	15.784	3331179	144708	50.047



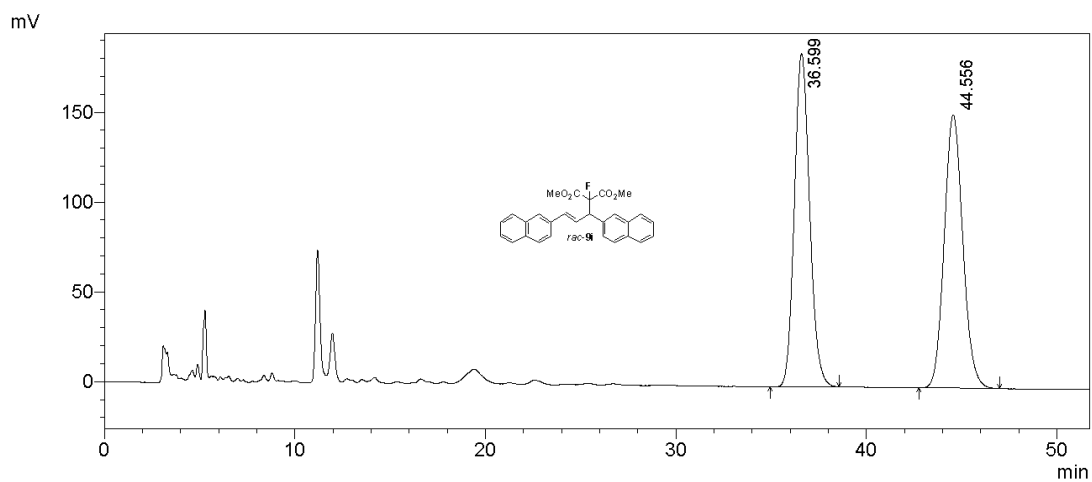
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	14.625	7647525	363658	89.858
2	15.758	863167	38777	10.142



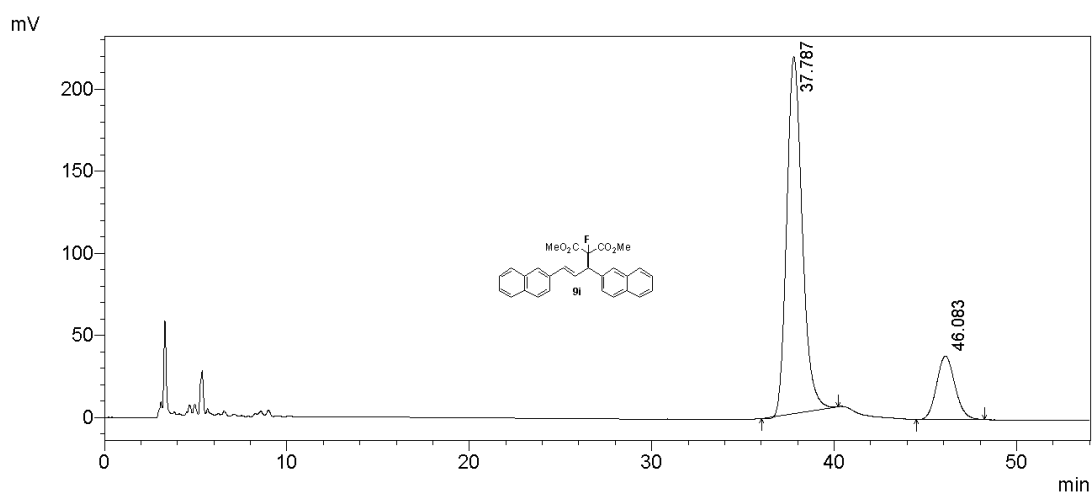
Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	9.739	3912678	265539	49.926
2	22.949	3924341	107543	50.074



Peak No.	R. Time	Peak Area	Peak Height	Percent (%)
1	9.799	4559851	317551	10.154
2	23.022	40348842	1074226	89.846

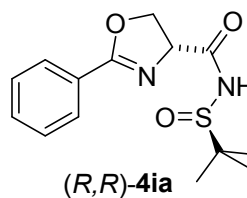
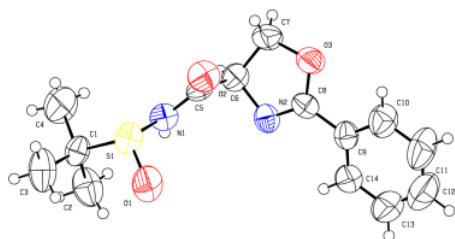


Peak No.	R. time	Peak Area	Peak Height	Percent (%)
1	36.599	10342461	185380	49.990
2	44.556	10346582	152198	50.010

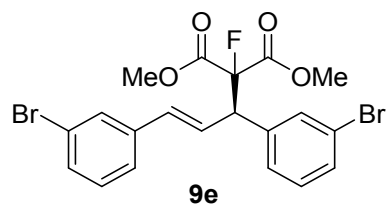
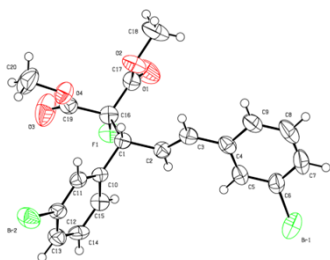


Peak No.	R. time	Peak Area	Peak Height	Percent (%)
1	37.787	12799766	217340	82.444
2	46.083	2725547	28914	17.556

X-ray single crystal data for 4ia and 9e



Chemical formula	C ₁₄ H ₁₈ N ₂ O ₃ S
Formula weight	294.36
Space group	P2 ₁
Z	2
a, Å	6.306(4)
b, Å	8.935(6)
c, Å	13.518(9)
α, °	90.00
β, °	96.662(8)
γ, °	90.00
V, Å ³	756.5(8)
T, K	293(2)
ρ, g/cm ³	1.292



Chemical formula

$C_{20}H_{17}Br_2FO_4$

Formula weight

500.15

Space group

$P2_1$

Z

2

$a, \text{\AA}$

11.651(4)

$b, \text{\AA}$

5.9117(18)

$c, \text{\AA}$

14.797(5)

$\alpha, ^\circ$

90.00

$\beta, ^\circ$

96.518(4)

$\gamma, ^\circ$

90.00

$V, \text{\AA}^3$

1012.6(4)

T, K

293(2)

$\rho, \text{g/cm}^3$

1.640