

Supporting Information for
Ligand-Free Copper-Catalyzed C(sp³)-H Imidation of Aromatic and Aliphatic
Methyl Sulfides with *N*-Fluorobenzenesulfonimide

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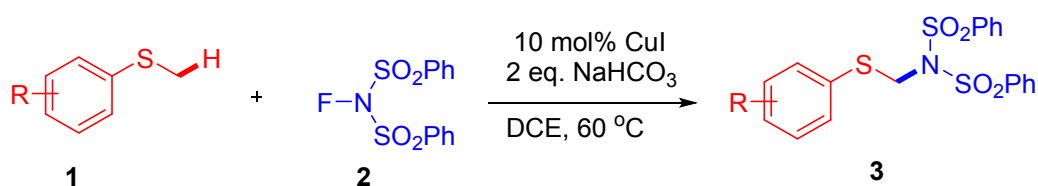
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1 Experimental Section

1.1 General information

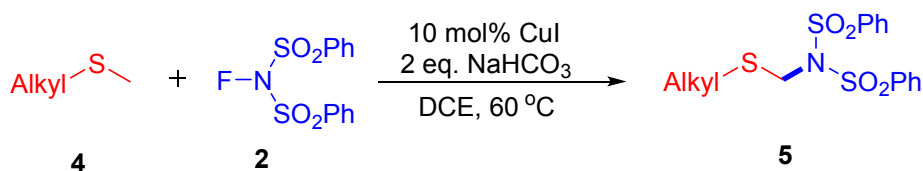
All chemicals were obtained from commercial suppliers and used without further purification. All reactions were conducted in oven-dried glasswares under air condition. ^1H NMR and ^{13}C NMR spectra were recorded on Bruker AVANCE DMX-400 spectrometry at 400MHz DMSO, respectively. Mass spectra were performed on a Bruker Esquire 3000plus mass spectrometer equipped with EI interface and ion trap analyzer. HRMS were obtained on a Bruker 7-tesla FT-ICR MS equipped with an electrospray source.

1.2 General procedure for the preparation of *N*-(phenylsulfonyl)-*N*-((phenylthio)methyl)benzenesulfonamide derivatives **3**



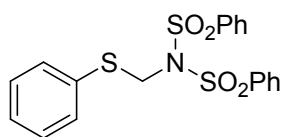
In a dry 25 mL round-bottom flask, aromatic methyl sulfide (0.5 mmol, 1 equiv), NFSI (0.6 mmol, 1.2 equiv), CuI (0.1 equiv) and NaHCO₃ (1 mmol, 2.0 equiv) were dissolved in 3 mL of DCE, the resulting mixture was heated to 60 °C for 8 h. The solution was then cooled to rt, diluted with CH₃COOC₂H₅, washed with a saturated aqueous solution of NaCl, dried over Na₂SO₄, filtered and evaporated under reduced pressure. The crude product was purified by silica gel column chromatography to afford the corresponding benzenesulfonamide derivatives.

1.3 General procedure for the preparation of *N*-((alkylthio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamides **5**



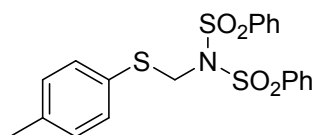
In a dry 25 mL round-bottom flask, aliphatic methyl sulfide (0.5 mmol, 1 equiv), NFSI (0.6 mmol, 1.2 equiv), CuI (0.1 equiv) and NaHCO₃ (1 mmol, 2.0 equiv) were dissolved in 3 mL of DCE, the resulting mixture was heated to 60 °C for 8 h. The solution was then cooled to rt, diluted with CH₃COOC₂H₅, washed with a saturated aqueous solution of NaCl, dried over Na₂SO₄, filtered and evaporated under reduced pressure. The crude product was purified by silica gel column chromatography to afford the corresponding benzenesulfonamide derivatives.

3a: *N*-(phenylsulfonyl)-*N*-((phenylthio)methyl)benzenesulfonamide: Isolated as white solid, yield 85%.



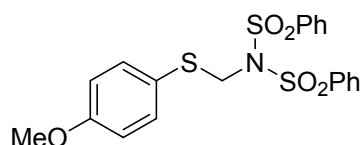
¹H NMR (400MHz, DMSO-*d*₆) δ: 7.98-7.95 (m, 4H), 7.81-7.77 (m, 2H), 7.68-7.64 (m, 4H), 7.33-7.30 (m, 5H), 5.42 (s, 2H). ¹³C NMR (100MHz, DMSO-*d*₆) δ: 139.1, 134.6, 133.1, 131.5, 129.4, 129.1, 127.9, 127.8, 54.2. HRMS (EI, m/z) M⁺: calcd for C₁₉H₁₇NO₄S₃: 419.0320; found: 419.0324.

3b: *N*-(phenylsulfonyl)-*N*-((*p*-tolylthio)methyl)benzenesulfonamide: Isolated as white solid, yield 88%.



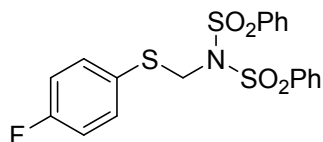
¹H NMR (400MHz, DMSO-*d*₆) δ: 7.99-7.99 (m, 4H), 7.80-7.76 (m, 2H), 7.68-7.64 (m, 4H), 7.21-7.11 (m, 4H), 5.37 (s, 2H), 2.27 (s, 3H). ¹³C NMR (100MHz, DMSO-*d*₆) δ: 139.1, 137.6, 134.5, 132.0, 129.7, 129.4, 127.9, 54.7, 20.6. HRMS (EI, m/z) M⁺: calcd for C₂₀H₁₉NO₄S₃: 433.0476; found: 433.0478.

3c: *N*-(((4-methoxyphenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as white solid, yield 90%.



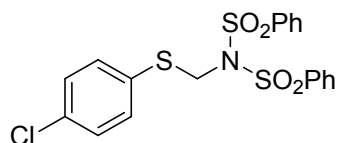
¹H NMR (400MHz, DMSO-*d*₆) δ: 8.03-8.01 (m, 4H), 7.83-7.80 (m, 2H), 7.80-7.79 (m, 4H), 7.26-7.24 (m, 2H), 6.91-6.88 (m, 2H), 5.32 (s, 2H), 3.76 (s, 3H). ¹³C NMR (100MHz, DMSO-*d*₆) δ: 159.5, 139.2, 134.7, 134.5, 129.4, 128.0, 123.0, 114.7, 55.6, 55.2. HRMS (EI, m/z) M⁺: calcd for C₂₀H₁₉NO₅S₃: 449.0425; found: 449.0430.

3d: *N*-(((4-fluorophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 76%.



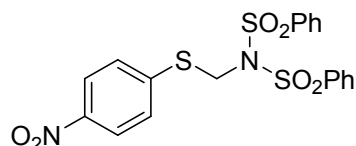
^1H NMR (400MHz, DMSO- d_6) δ : 8.00-7.98 (m, 4H), 7.82-7.78 (m, 2H), 7.78-7.76 (m, 4H), 7.37-7.18 (m, 2H), 7.19-7.14 (m, 2H), 5.38 (s, 2H). ^{13}C NMR (100MHz, DMSO- d_6) δ : 163.3, 160.8, 139.1, 134.8, 134.7, 134.6, 132.0, 129.4, 128.4, 128.3, 127.9, 116.3, 116.0, 55.0. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{FNO}_4\text{S}_3$: 437.0220; found: 437.0221.

3e: *N*-(((4-chlorophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 81%.



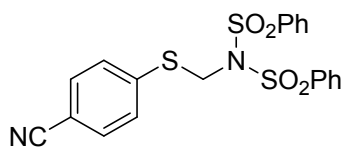
^1H NMR (400MHz, DMSO- d_6) δ : 7.98-7.95 (m, 4H), 7.82-7.78 (m, 2H), 7.69-7.65 (m, 4H), 7.40-7.33 (m, 4H), 5.42 (s, 2H). ^{13}C NMR (100MHz, DMSO- d_6) δ : 138.9, 134.6, 133.4, 132.7, 132.0, 129.4, 129.0, 128.0, 54.2. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{ClNO}_4\text{S}_3$: 452.9984; found: 452.9983.

3f: *N*-(((4-nitrophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 72%.



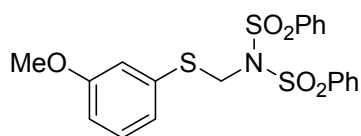
^1H NMR (400MHz, DMSO- d_6) δ : 8.15-8.13 (m, 2H), 7.98-7.95 (m, 4H), 7.82-7.78 (m, 2H), 7.68-7.61 (m, 6H), 5.61 (s, 2H). ^{13}C NMR (100MHz, DMSO- d_6) δ : 145.9, 143.3, 138.7, 134.8, 129.8, 129.5, 127.9, 123.8, 52.1. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{N}_2\text{O}_6\text{S}_3$: 464.0269; found: 464.0267.

3g: *N*-(((4-cyanophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as white solid, yield 77%.



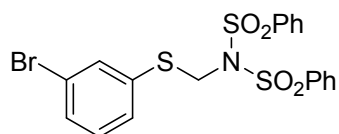
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.98-7.96 (m, 4H), 7.86-7.77 (m, 3H), 7.68-7.64 (m, 4H), 7.41-7.35 (m, 2H), 7.02-6.98 (m, 1H), 5.46 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 139.4, 138.8, 138.3, 134.7, 130.7, 129.5, 128.9, 128.8, 127.9, 102.3, 53.3. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{20}\text{H}_{16}\text{N}_2\text{O}_4\text{S}_3$: 444.0272; found: 444.0271.

3h: *N*-(((3-methoxyphenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as white solid, yield 93%.



^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.99-7.97 (m, 4H), 7.82-7.78 (m, 2H), 7.68-7.64 (m, 4H), 7.25-7.22 (m, 1H), 6.92-6.84 (m, 3H), 5.44 (s, 2H), 3.71 (s, 3H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 159.3, 139.1, 134.5, 134.2, 129.9, 129.4, 127.9, 123.3, 116.2, 113.9, 55.1, 54.0. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{20}\text{H}_{19}\text{NO}_5\text{S}_3$: 449.0425; found: 449.0425.

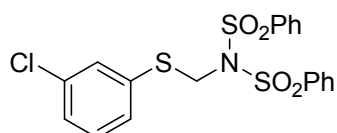
3i: *N*-(phenylsulfonyl)-*N*-((phenylthio)methyl)benzenesulfonamide: Isolated as light yellow solid, yield 82%.



^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.98-7.95 (m, 4H), 7.83-7.79 (m, 2H), 7.69-7.65 (m, 4H), 7.50-7.47 (m, 2H), 7.45-7.36 (m, 1H), 7.35-7.25 (m, 1H), 5.46 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ :

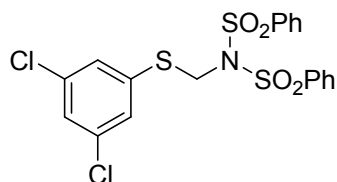
138.9, 135.5, 134.6, 130.8, 130.6, 130.3, 129.4, 127.9, 121.9, 53.8. HRMS (EI, m/z) M^+ : calcd for $C_{19}H_{16}BrNO_4S_3$: 496.9425; found: 496.9427.

3j: *N*-(((3-chlorophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 79%.



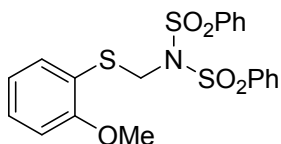
1H NMR (400MHz, $DMSO-d_6$) δ : 7.98-7.95 (m, 4H), 7.82-7.78 (m, 2H), 7.69-7.65 (m, 4H), 7.36-7.31 (m, 4H), 5.46 (s, 2H). ^{13}C NMR (100MHz, $DMSO-d_6$) δ : 138.9, 135.2, 134.6, 133.3, 130.7, 130.6, 129.8, 127.9, 127.7, 53.8. HRMS (EI, m/z) M^+ : calcd for $C_{19}H_{16}ClNO_4S_3$: 452.9930; found: 452.9930.

3k: *N*-(((3,5-dichlorophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 76%.



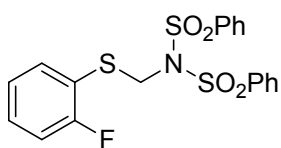
1H NMR (400MHz, $DMSO-d_6$) δ : 8.00-7.97 (t, $J = 7.8$ Hz, 4H), 7.83-7.79 (t, $J = 7.5$ Hz, 2H), 7.70-7.66 (m, 4H), 7.53-7.51 (t, $J = 1.8$ Hz, 1H), 7.36-7.35 (d, $J = 1.8$ Hz, 2H), 5.52 (s, 2H). ^{13}C NMR (100MHz, $DMSO-d_6$) δ : 138.9, 136.9, 134.6, 134.1, 129.4, 129.3, 127.9, 127.3, 53.4. HRMS (EI, m/z) M^+ : calcd for $C_{19}H_{15}Cl_2NO_4S_3$: 486.9540; found: 486.9538.

3l: *N*-(((2-methoxyphenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as white solid, yield 91%.



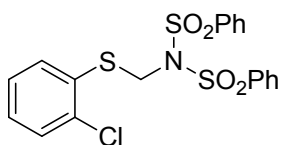
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.97-7.94 (m, 4H), 7.82-7.77 (m, 2H), 7.69-7.65 (m, 4H), 7.32-7.31 (t, $J = 0.8$ Hz, 1H), 7.09-7.01 (m, 2H), 6.86-6.82 (m, 1H), 5.38 (s, 2H), 3.82 (s, 3H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 158.4, 139.1, 134.4, 133.1, 129.9, 129.3, 127.9, 120.6, 119.7, 111.4, 55.6, 52.1. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{20}\text{H}_{19}\text{NO}_5\text{S}_3$: 449.0425; found: 449.0428.

3m: *N*-(((2-fluorophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 78%.



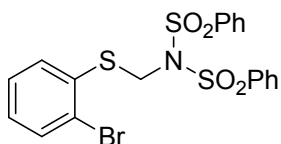
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.98-7.96 (m, 4H), 7.80-7.79 (m, 2H), 7.67 (s, 4H), 7.39-7.13 (m, 4H), 5.39 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 138.9, 134.6, 134.5, 131.0, 130.9, 129.4, 127.9, 124.9, 116.0, 115.8, 53.2. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{FNO}_4\text{S}_3$: 437.0225; found: 437.0225.

3n: *N*-(((2-chlorophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 75%.



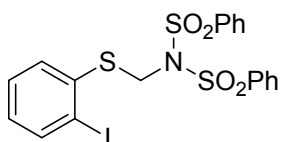
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.99-7.96 (m, 4H), 7.83-7.78 (m, 2H), 7.69-7.64 (m, 4H), 7.51-7.40 (m, 2H), 7.32-7.29 (m, 2H), 5.48 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 138.8, 134.7, 134.6, 132.7, 131.9, 129.8, 129.4, 127.9, 127.7, 52.6. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{ClNO}_4\text{S}_3$: 452.9930; found: 452.9933.

3o: *N*-(((2-bromophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as light yellow solid, yield 74%.



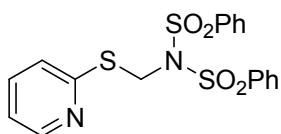
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.99-7.96 (m, 4H), 7.82-7.78 (m, 2H), 7.69-7.64 (m, 5H), 7.46-7.33 (m, 2H), 7.24-7.19 (m, 1H), 5.49 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 138.8, 134.6, 134.2, 133.0, 132.0, 129.4, 129.1, 128.2, 127.9, 124.9, 52.6. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{BrNO}_4\text{S}_3$: 496.9425; found: 496.9427.

3p: *N*-(((2-iodophenyl)thio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as white solid, yield 80%.



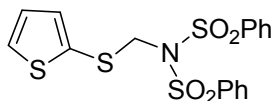
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 8.00-7.98 (m, 4H), 7.82-7.78 (m, 4H), 7.69-7.65 (m, 4H), 7.58-7.56 (m, 2H), 5.59 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 140.6, 138.7, 134.6, 132.5, 130.1, 129.4, 127.9, 118.5, 109.3, 52.4. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{INO}_4\text{S}_3$: 544.9286; found: 544.9286.

3q: *N*-(phenylsulfonyl)-*N*-((pyridin-2-ylthio)methyl)benzenesulfonamide: Isolated as white solid, yield 83%.



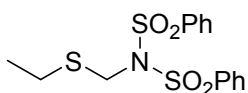
^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 8.53-8.50 (m, 1H), 7.91-7.88 (m, 4H), 7.75 (m, 2H), 7.61-7.57 (m, 5H), 7.22-7.15 (m, 2H), 5.91 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 155.0, 149.2, 138.6, 137.1, 134.6, 129.3, 127.7, 122.5, 120.9, 47.8. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{18}\text{H}_{16}\text{N}_2\text{O}_4\text{S}_3$: 420.0272; found: 420.0275.

3r: *N*-(phenylsulfonyl)-*N*-((thiophen-2-ylthio)methyl)benzenesulfonamide: Isolated as white solid, yield 84%.



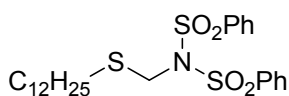
^1H NMR (400MHz, DMSO- d_6) δ : 8.04-8.01 (m, 4H), 7.84-7.79 (m, 2H), 7.72-7.67 (m, 5H), 7.04-6.94 (m, 2H), 5.24 (s, 2H). ^{13}C NMR (100MHz, DMSO- d_6) δ : 139.1, 135.8, 134.6, 132.1, 129.5, 129.4, 128.0, 127.9, 51.1. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{17}\text{H}_{15}\text{NO}_4\text{S}_4$: 424.9884; found: 424.9885.

5a: *N*-((ethylthio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as colorless liquid, yield 76%.



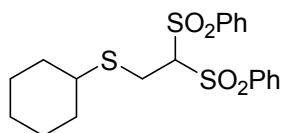
^1H NMR (400MHz, DMSO- d_6) δ : 8.06-8.04 (t, $J = 8.0$ Hz, 4H), 7.81-7.77 (m, 2H), 7.70-7.66 (m, 4H), 5.05 (s, 2H), 2.54-2.50 (m, 2H), 1.50-1.45 (m, 2H), 0.85-0.80 (m, 3H). ^{13}C NMR (100MHz, DMSO- d_6) δ : 139.2, 134.4, 129.3, 127.9, 51.7, 22.2, 13.1. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{16}\text{H}_{19}\text{NO}_4\text{S}_3$: 385.0476; found: 385.0475.

5b: *N*-((dodecylthio)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as colorless liquid, yield 81%.



^1H NMR (400MHz, DMSO- d_6) δ : 8.07-8.05 (d, $J = 6.0$ Hz, 4H), 7.77-7.75 (d, $J = 6.6$ Hz, 2H), 7.67-7.64 (t, $J = 6.6$ Hz, 4H), 5.06 (s, 2H), 1.42-0.83 (m, 25H). ^{13}C NMR (100MHz, DMSO- d_6) δ : 139.3, 134.2, 129.2, 127.9, 51.8, 31.3, 31.0, 29.0, 28.8, 28.7, 28.5, 28.1, 22.1, 13.8. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{25}\text{H}_{37}\text{NO}_4\text{S}_3$: 511.1885; found: 511.1883.

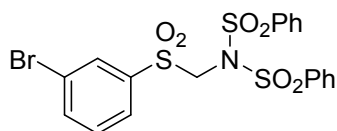
5c: (2,2-bis(phenylsulfonyl)ethyl)(cyclohexyl)sulfane: Isolated as white solid, yield 72%.



^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 8.09-8.07 (t, $J = 8.6$ Hz, 4H), 7.80-7.75 (m, 2H), 7.69-7.66 (m, 4H), 5.08 (s, 2H), 1.81-1.79 (m, 2H), 1.47-1.59 (m, 3H), 2.01-1.14 (m, 6H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 139.4, 134.3, 129.3, 127.9, 50.5, 42.6, 32.9, 25.3, 25.1.

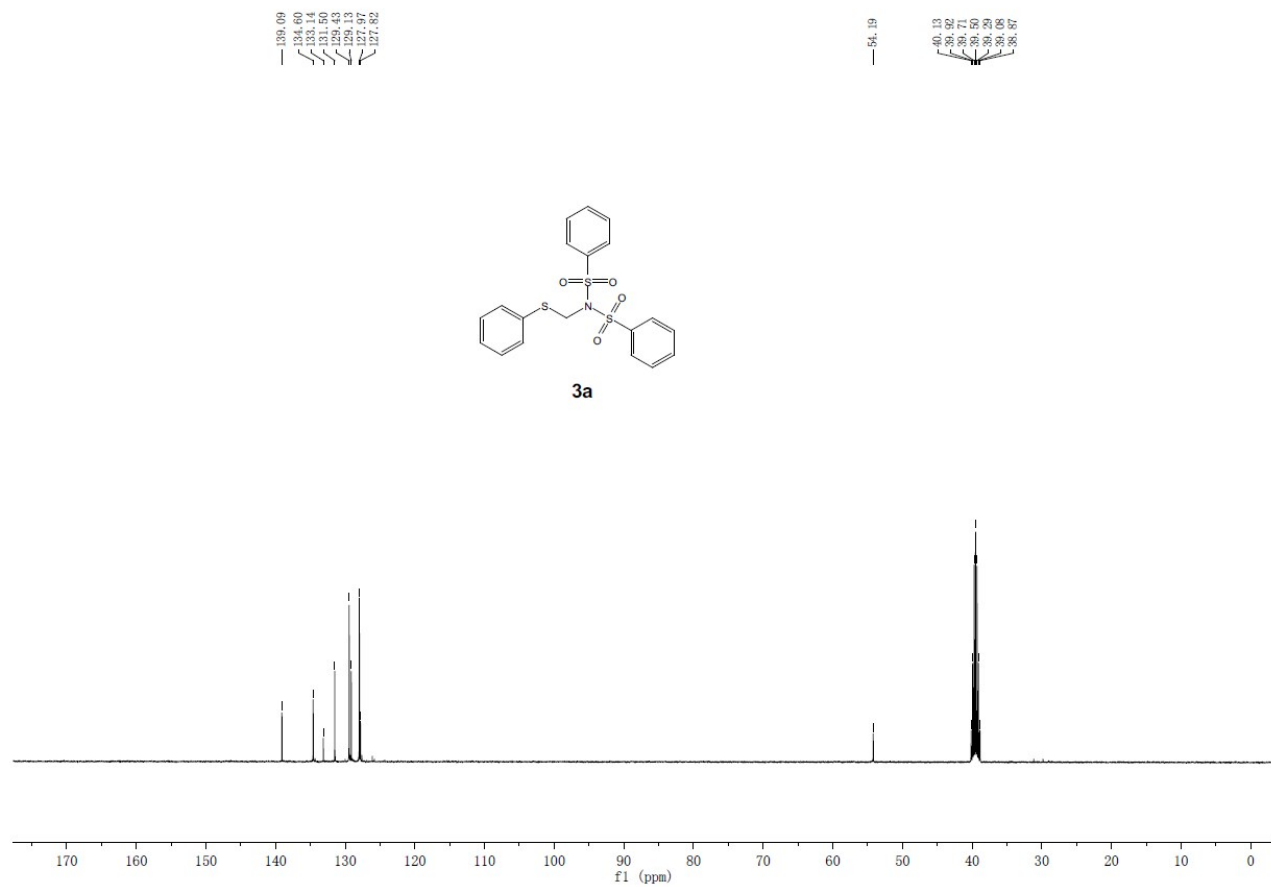
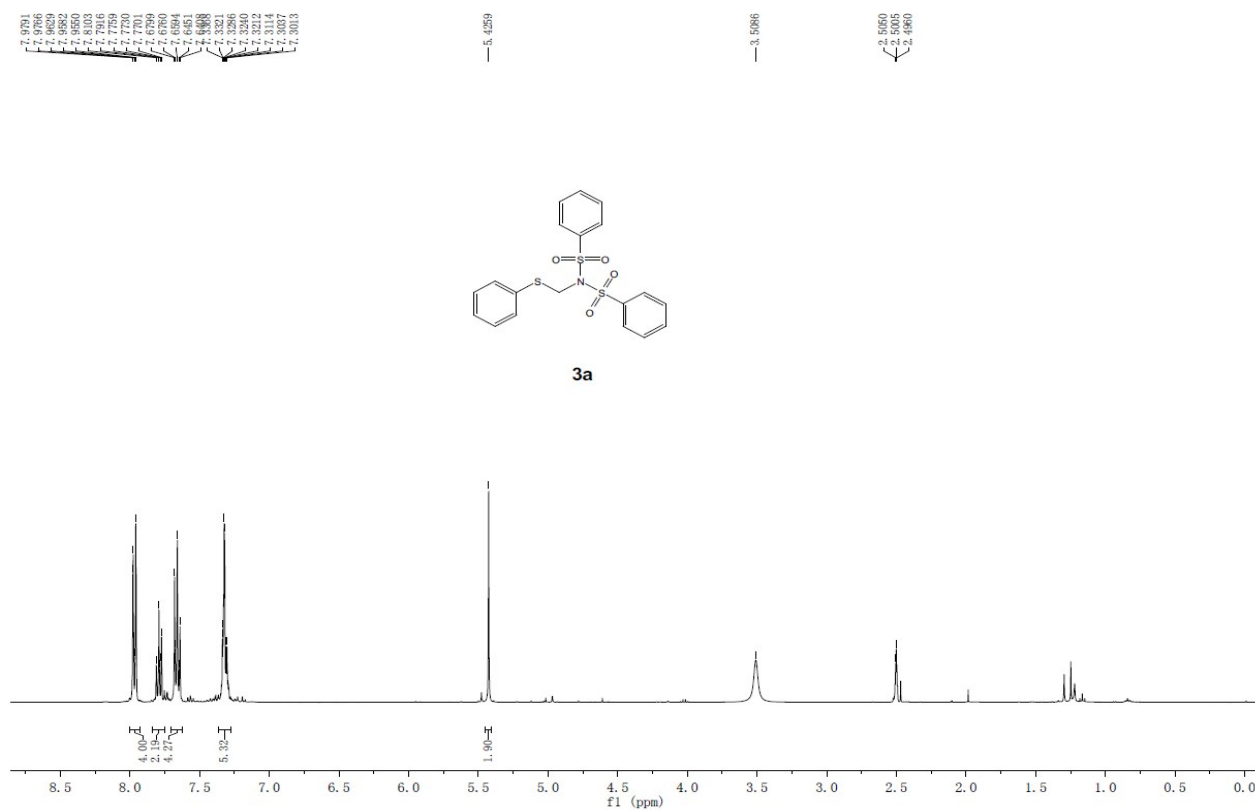
HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{23}\text{NO}_4\text{S}_3$: 425.0789; found: 425.0788.

6: *N*-(((3-bromophenyl)sulfonyl)methyl)-*N*-(phenylsulfonyl)benzenesulfonamide: Isolated as white solid, yield 72%.



^1H NMR (400MHz, $\text{DMSO-}d_6$) δ : 7.98-7.96 (d, $J = 8.4$ Hz, 4H), 7.77-7.74 (t, $J = 7.6$ Hz, 4H), 7.62-7.53 (m, 6H), 5.56 (s, 2H). ^{13}C NMR (100MHz, $\text{DMSO-}d_6$) δ : 139.8, 138.6, 137.9, 135.4, 129.8, 129.1, 128.3, 128.2, 122.6, 67.6. HRMS (EI, m/z) M^+ : calcd for $\text{C}_{19}\text{H}_{16}\text{BrNO}_6\text{S}_3$: 528.9323; found: 528.9323.

2 ¹H and ¹³C NMR Data

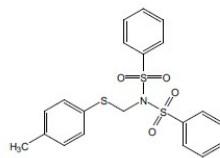


7.9865
7.9845
7.9795
7.9659
7.9627
7.9590
7.9540
7.9484
7.9387
7.9357
7.9271
7.9255
7.9219
7.9173
7.9155
7.9111
7.9076
7.9076

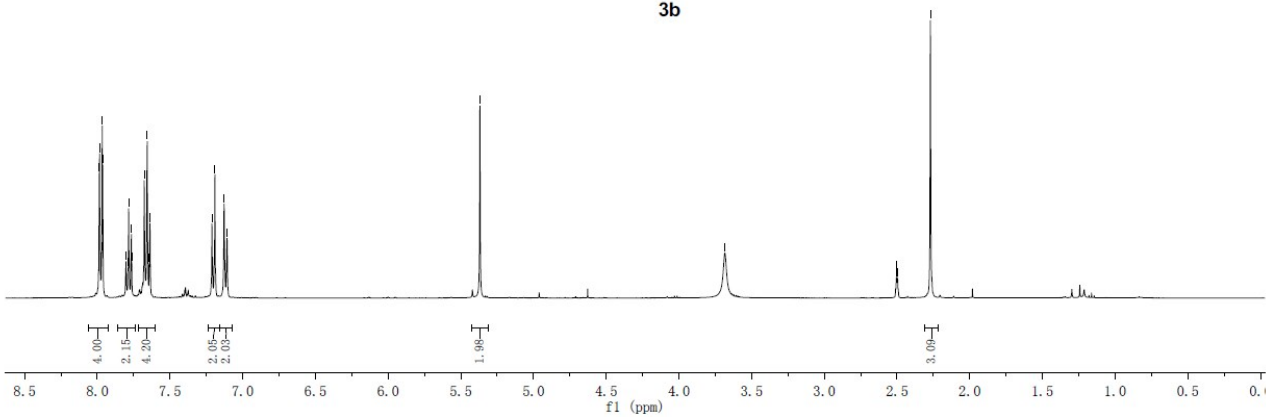
6.3685

3.6839

2.5048
2.5003
2.4958
2.2704



3b

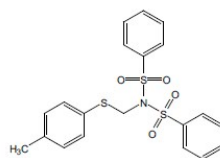


138.15
137.60
132.02
129.74
128.41
128.38
127.96

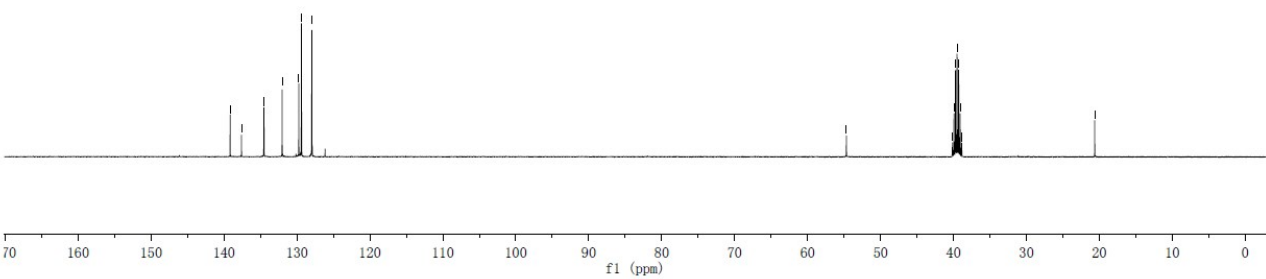
54.68

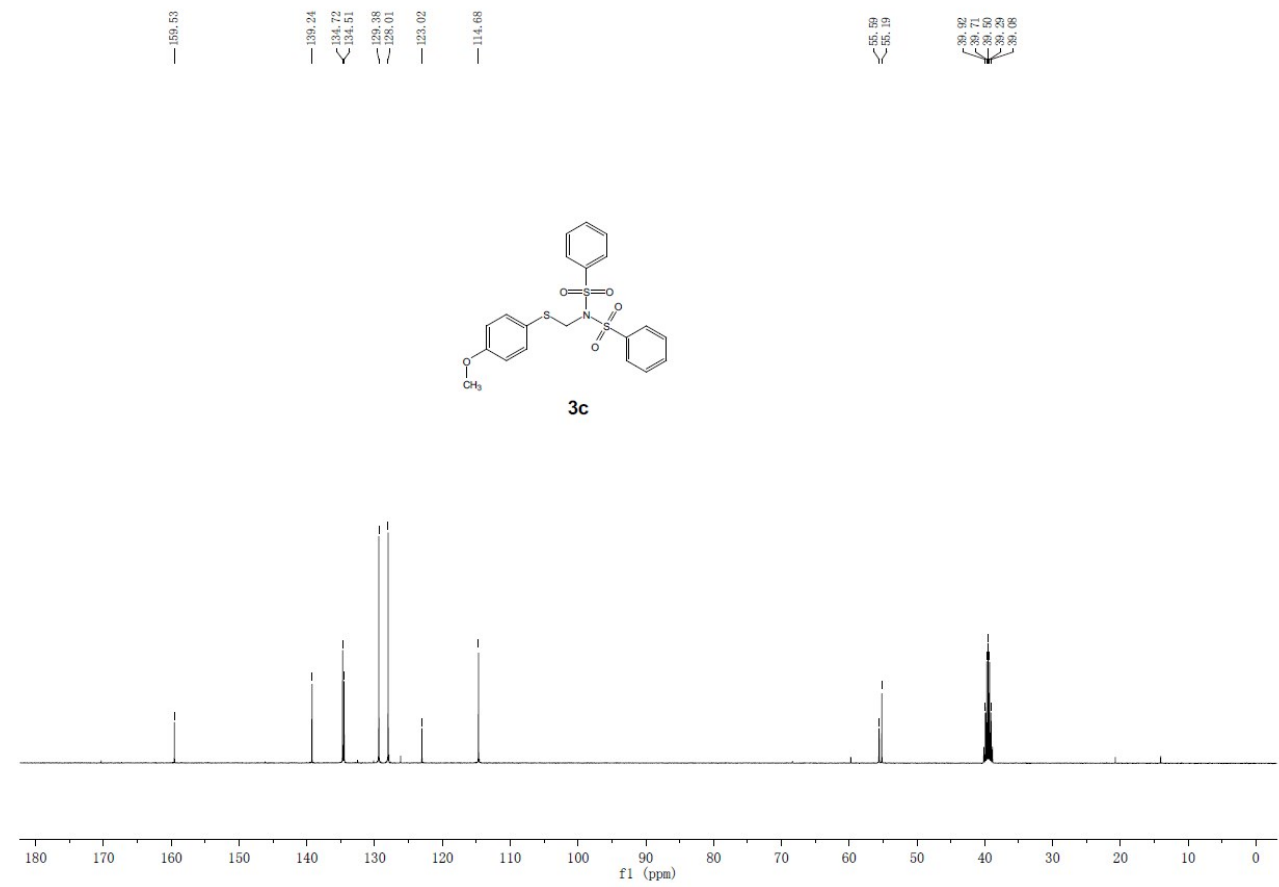
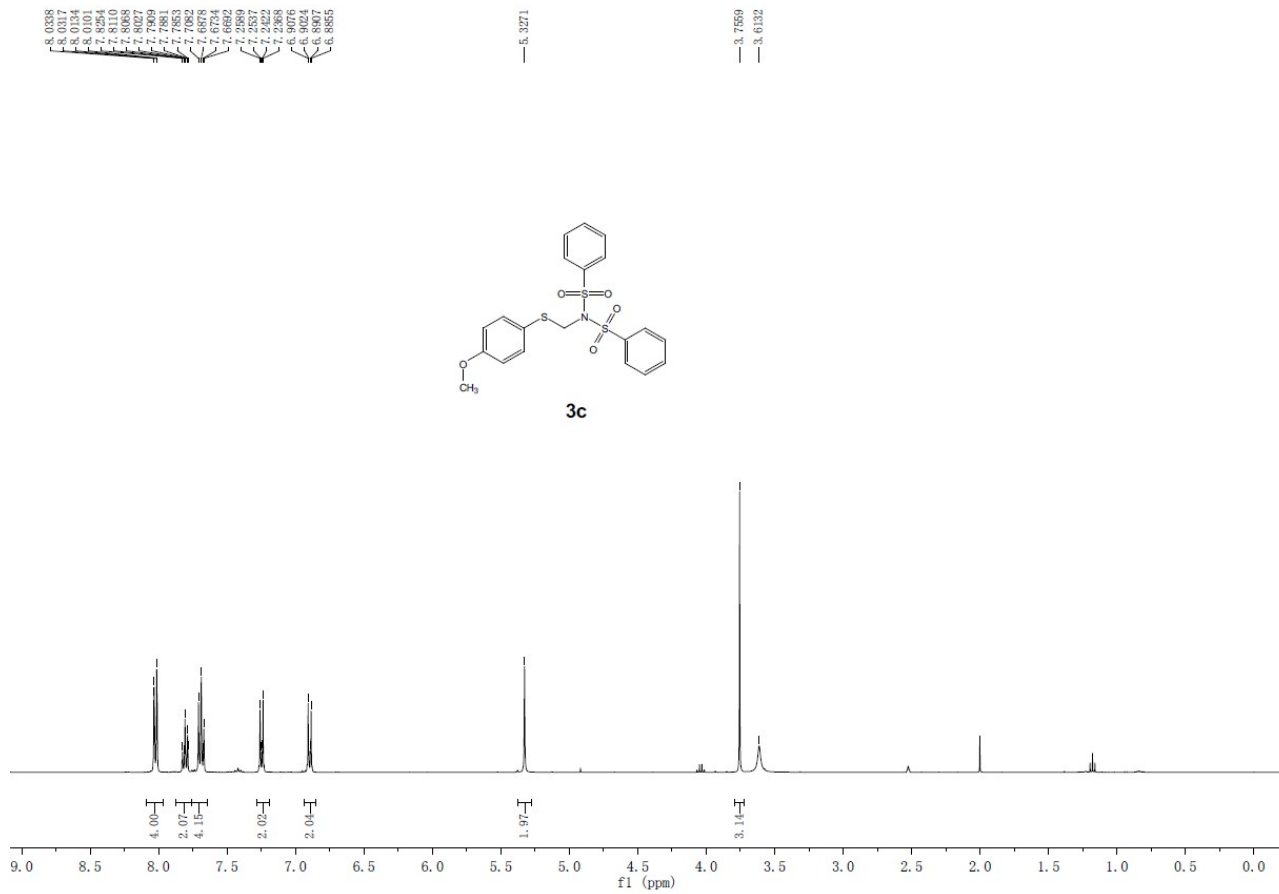
40.13
39.82
39.71
39.50
39.29
39.08
38.88

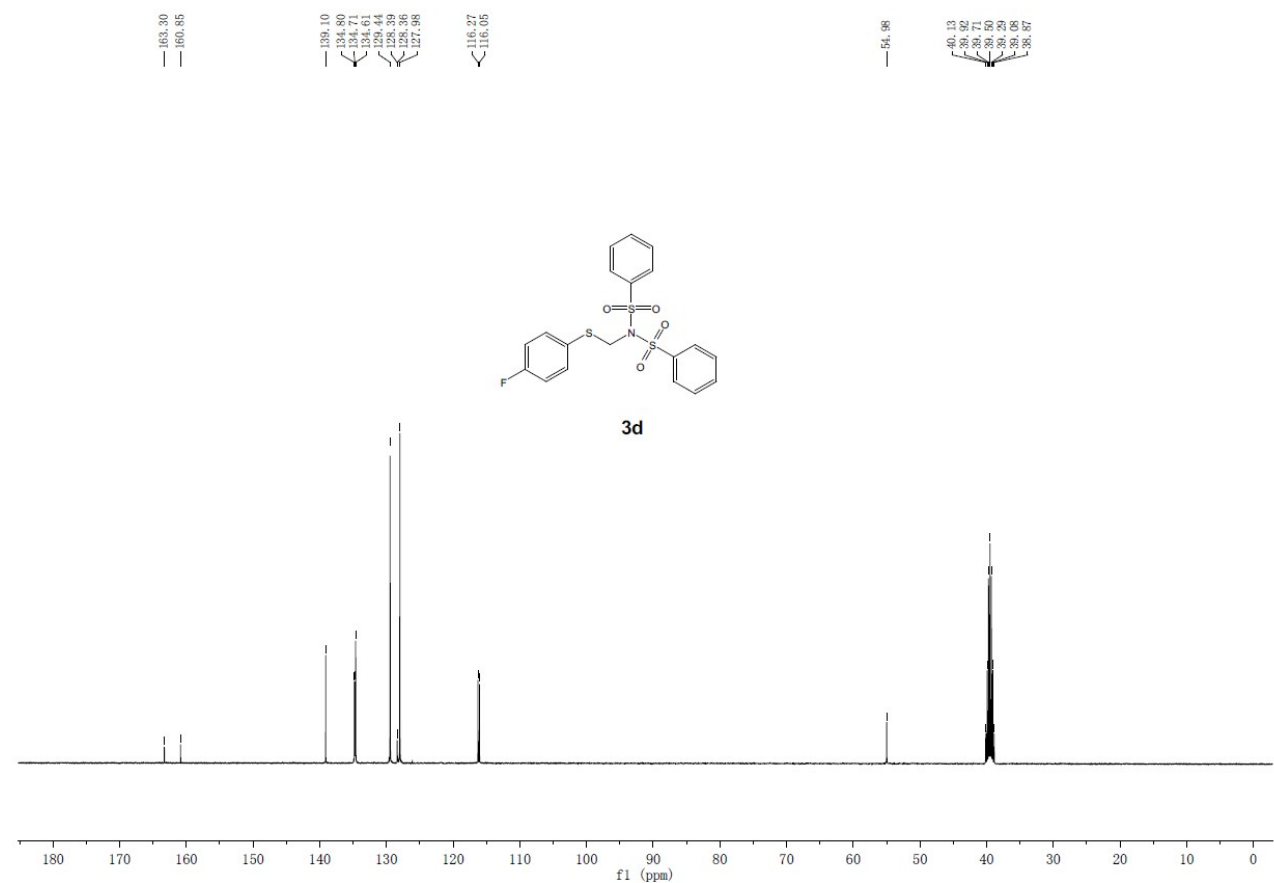
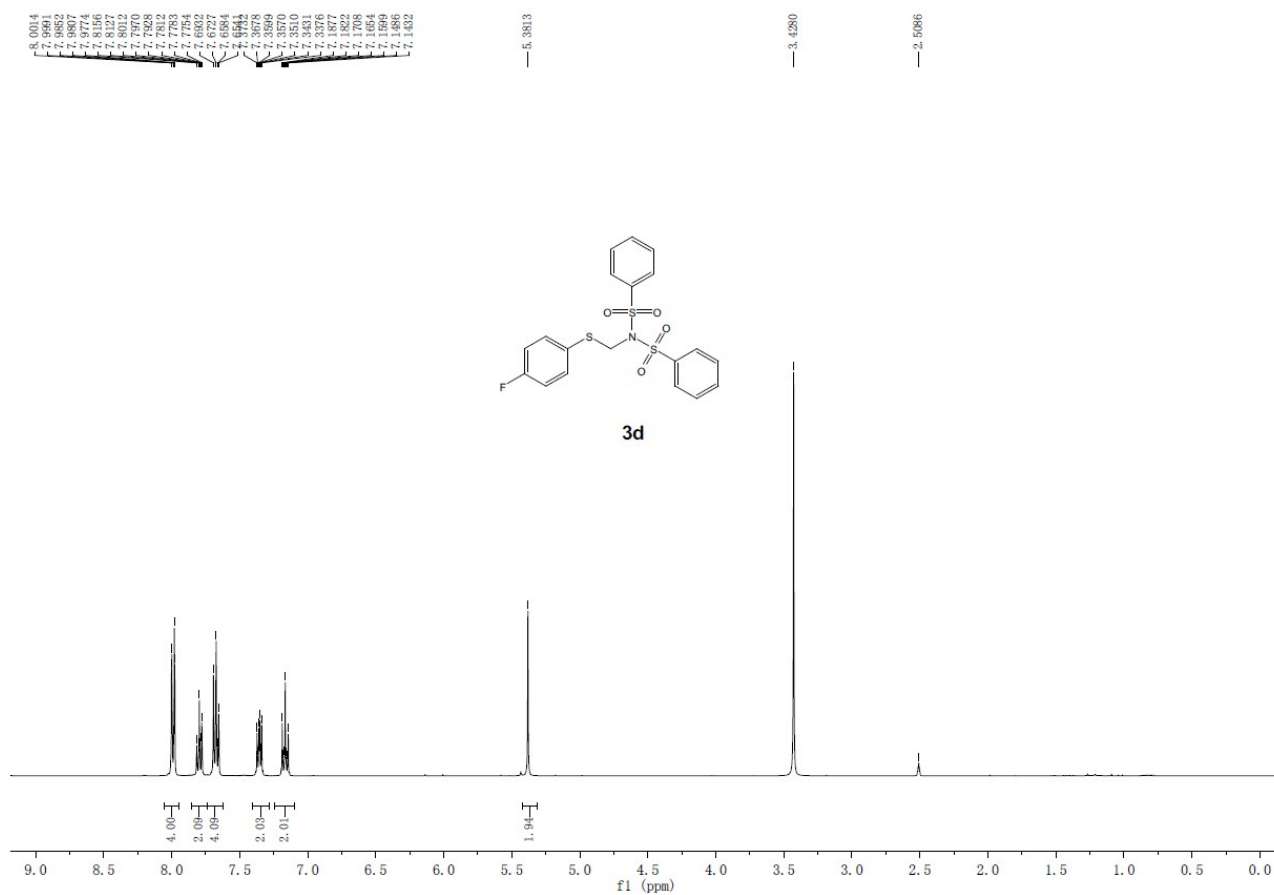
20.63

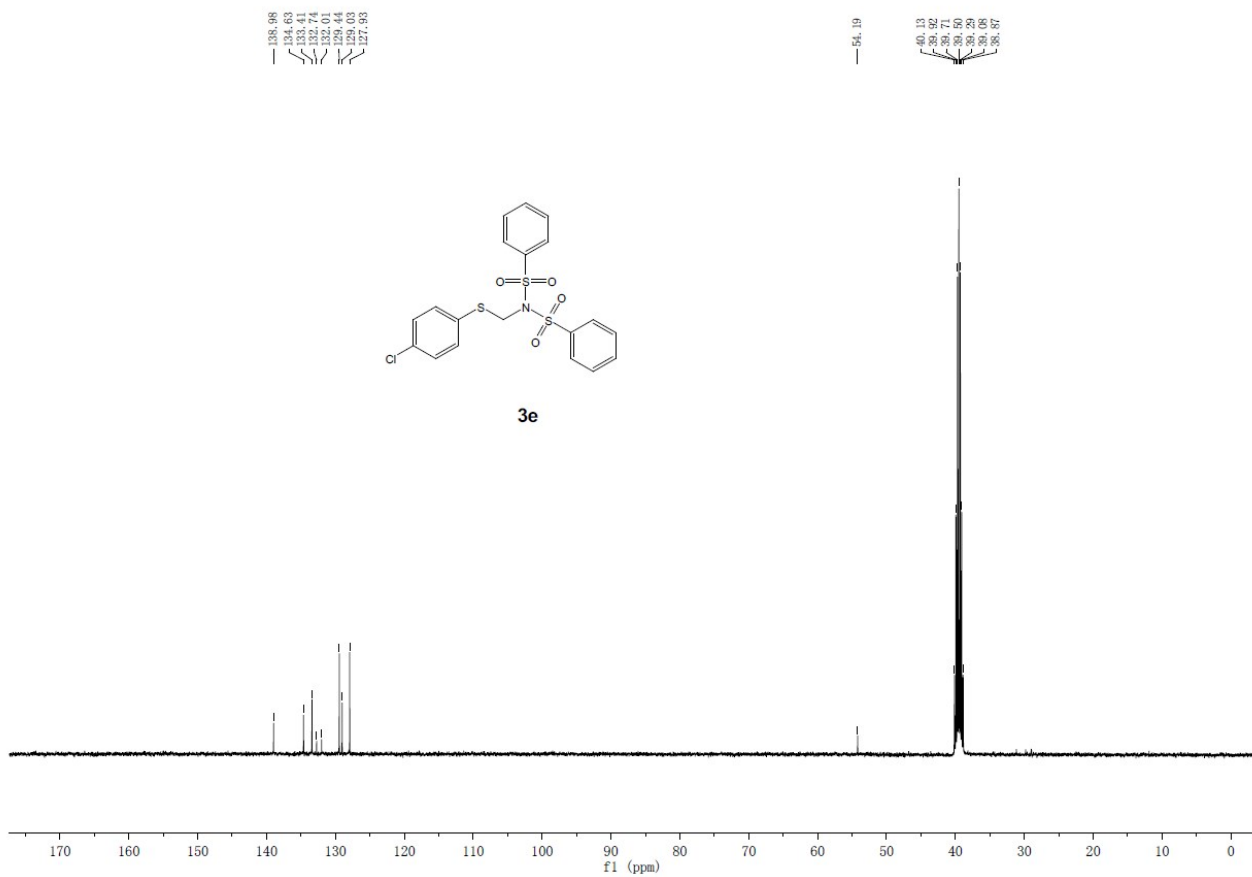
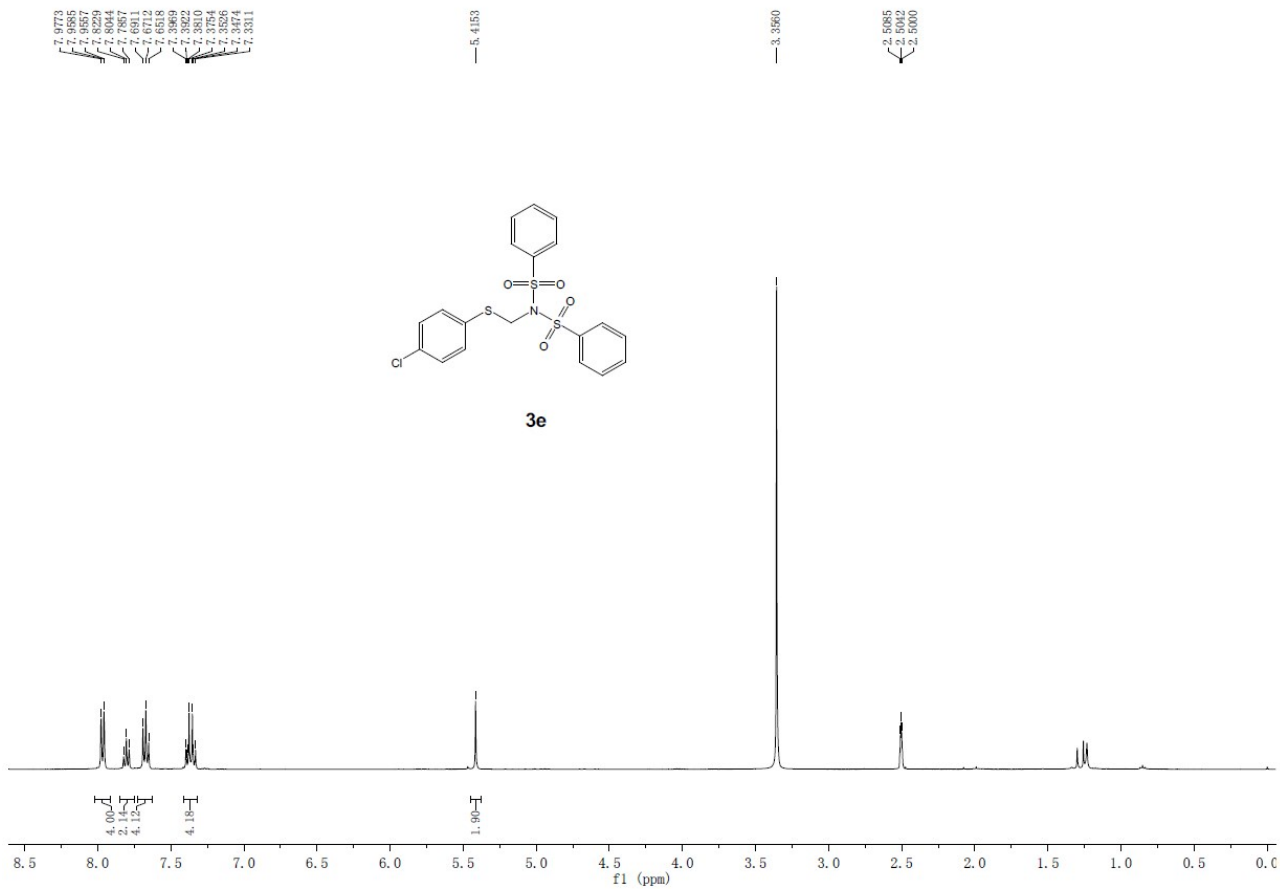


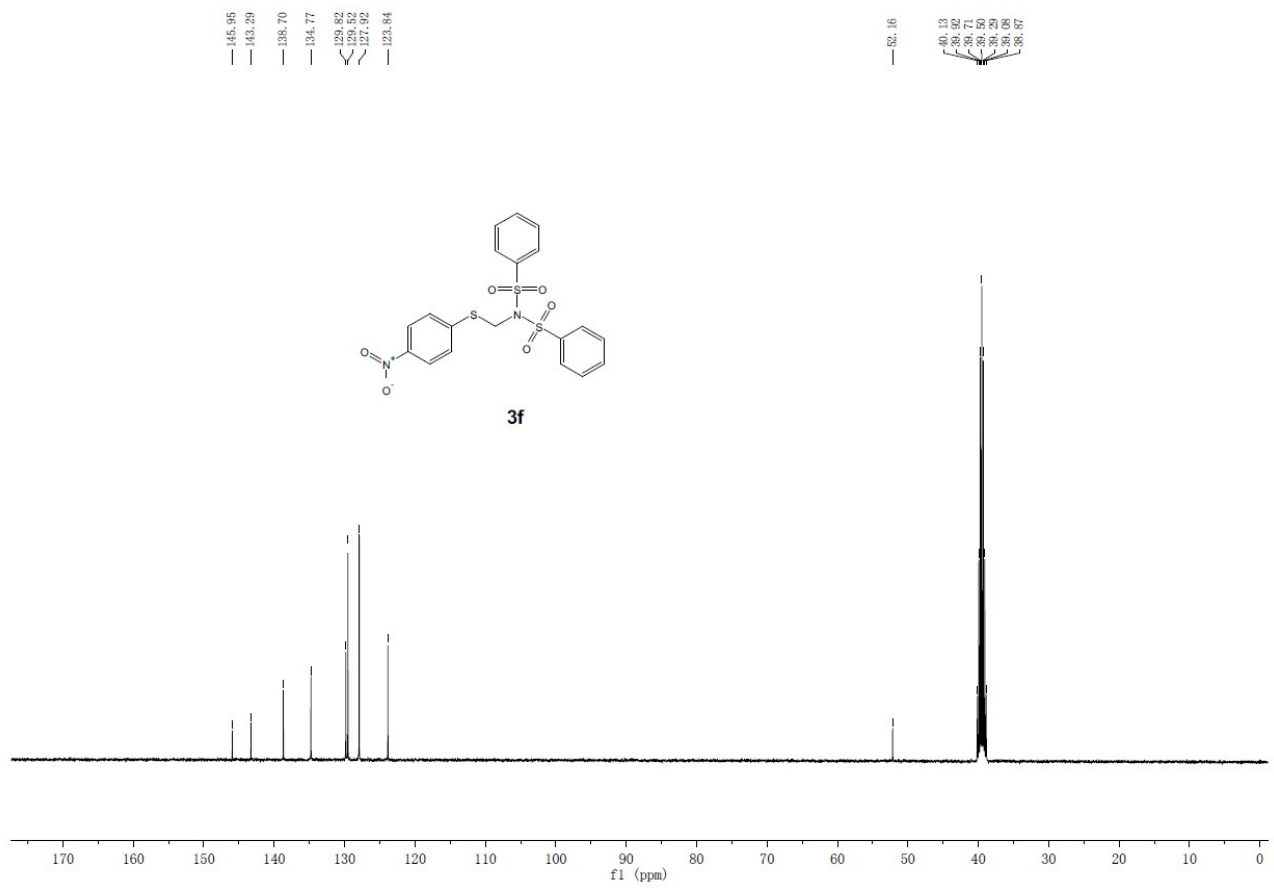
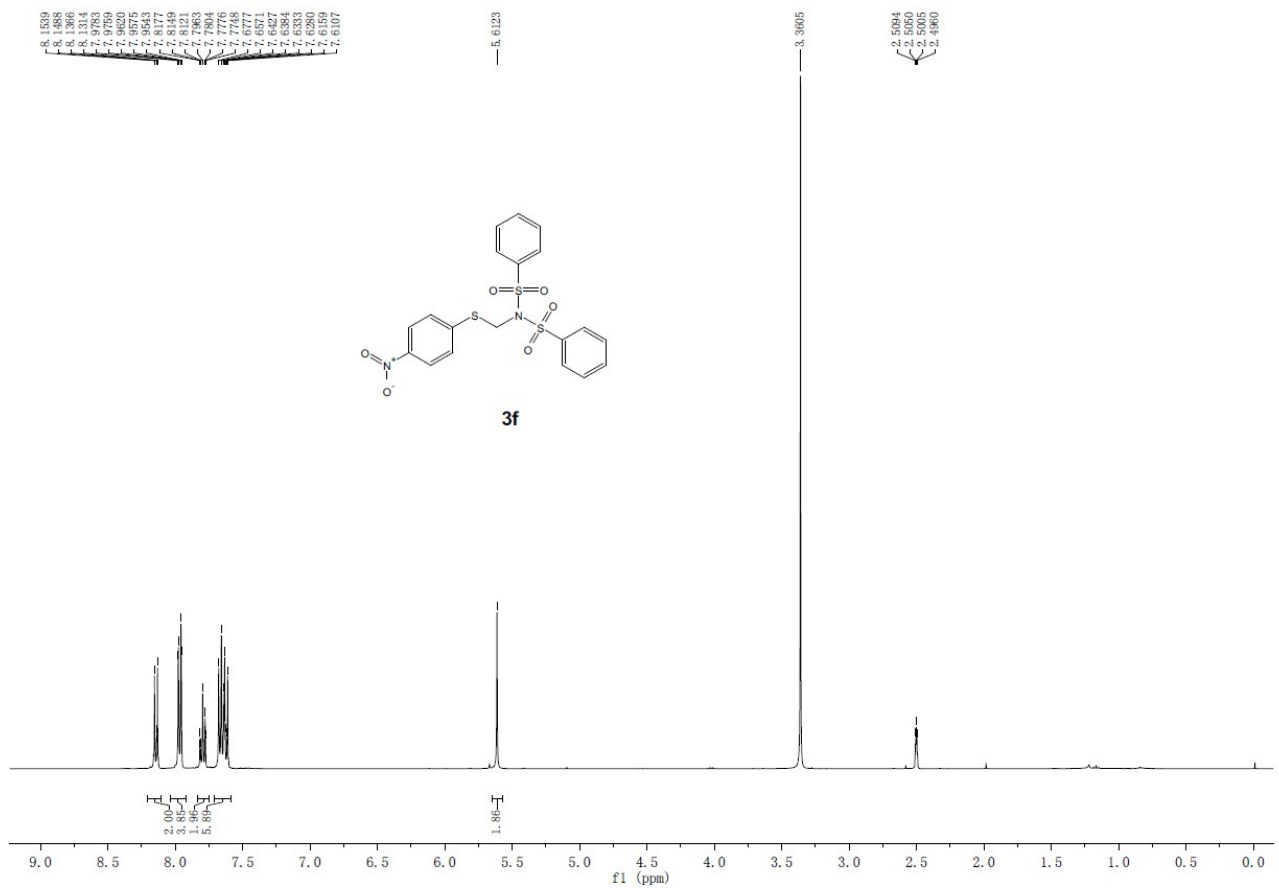
3b

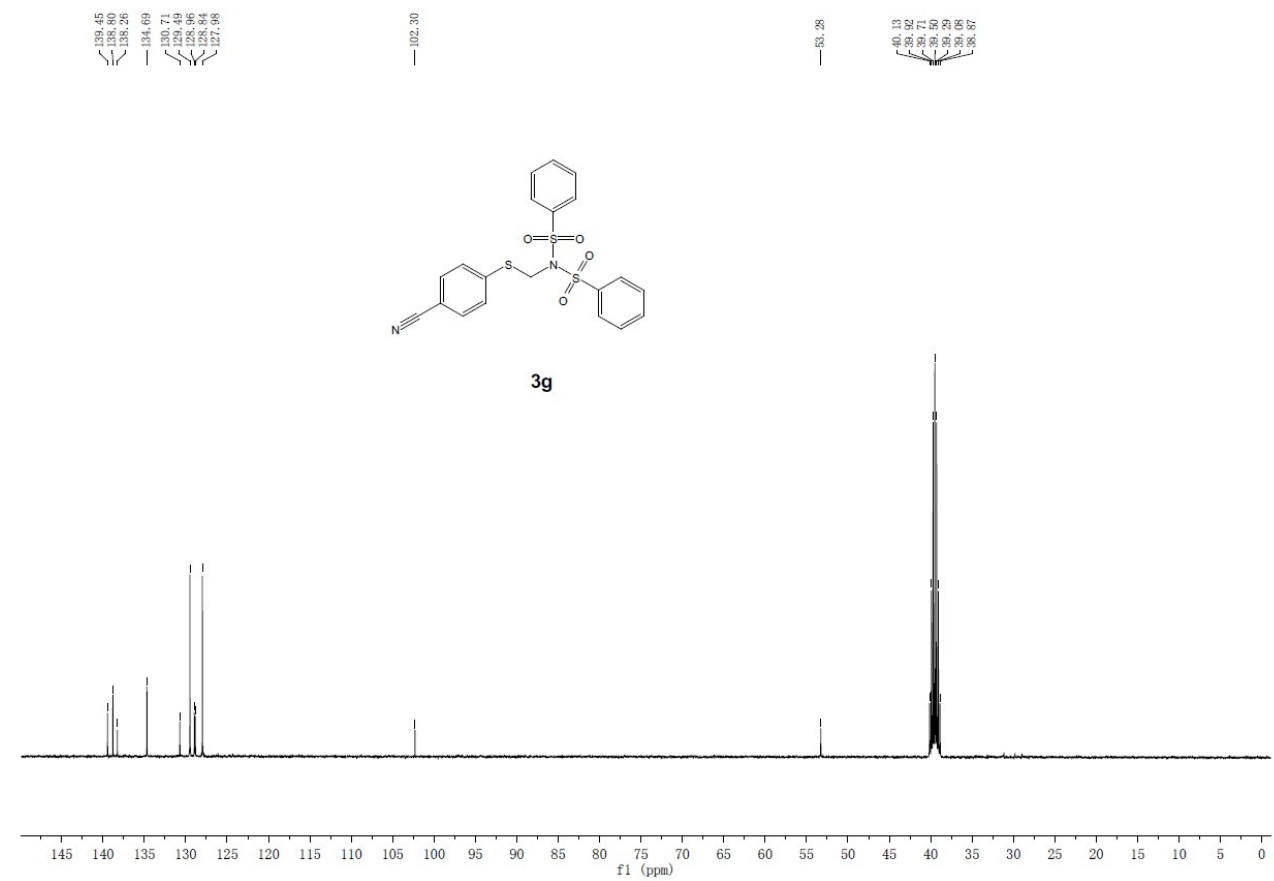


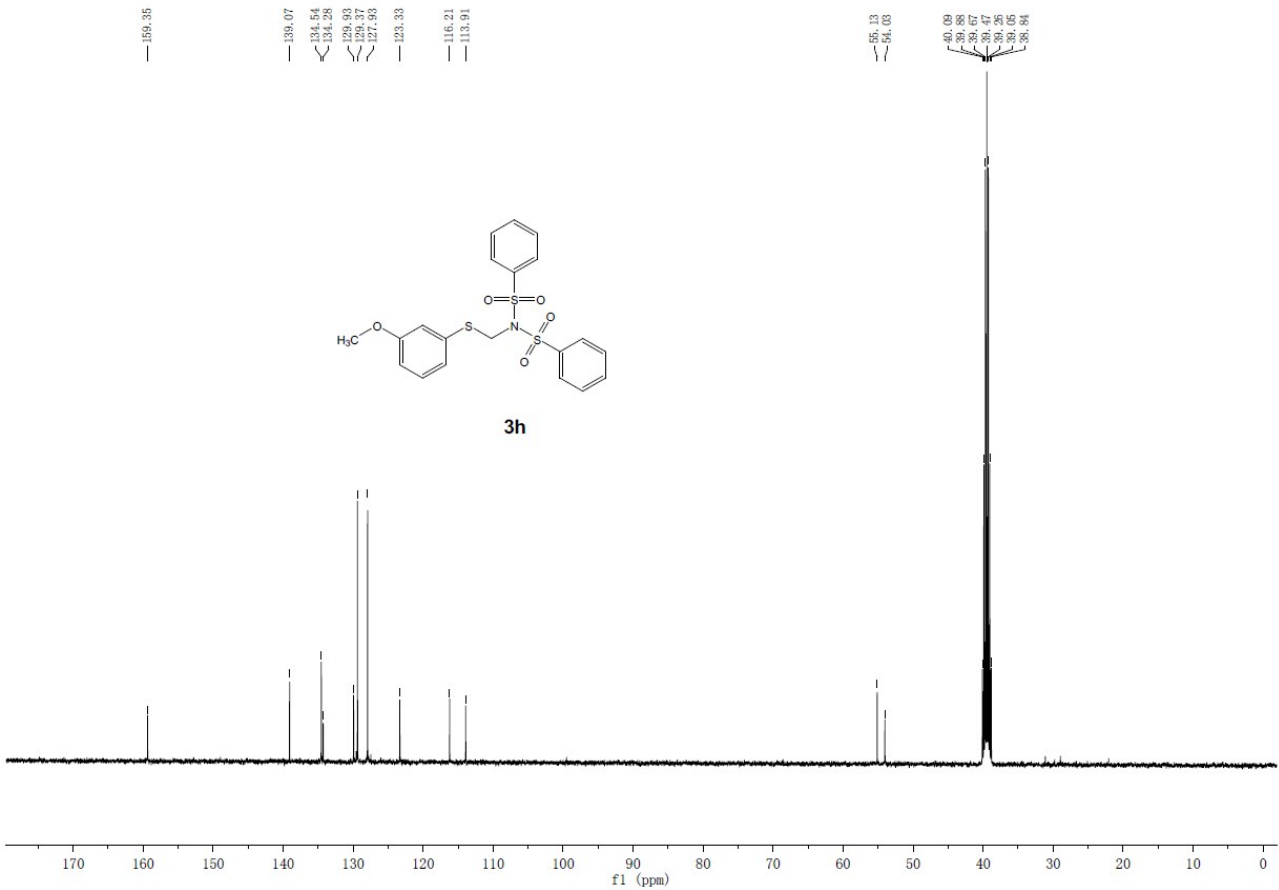
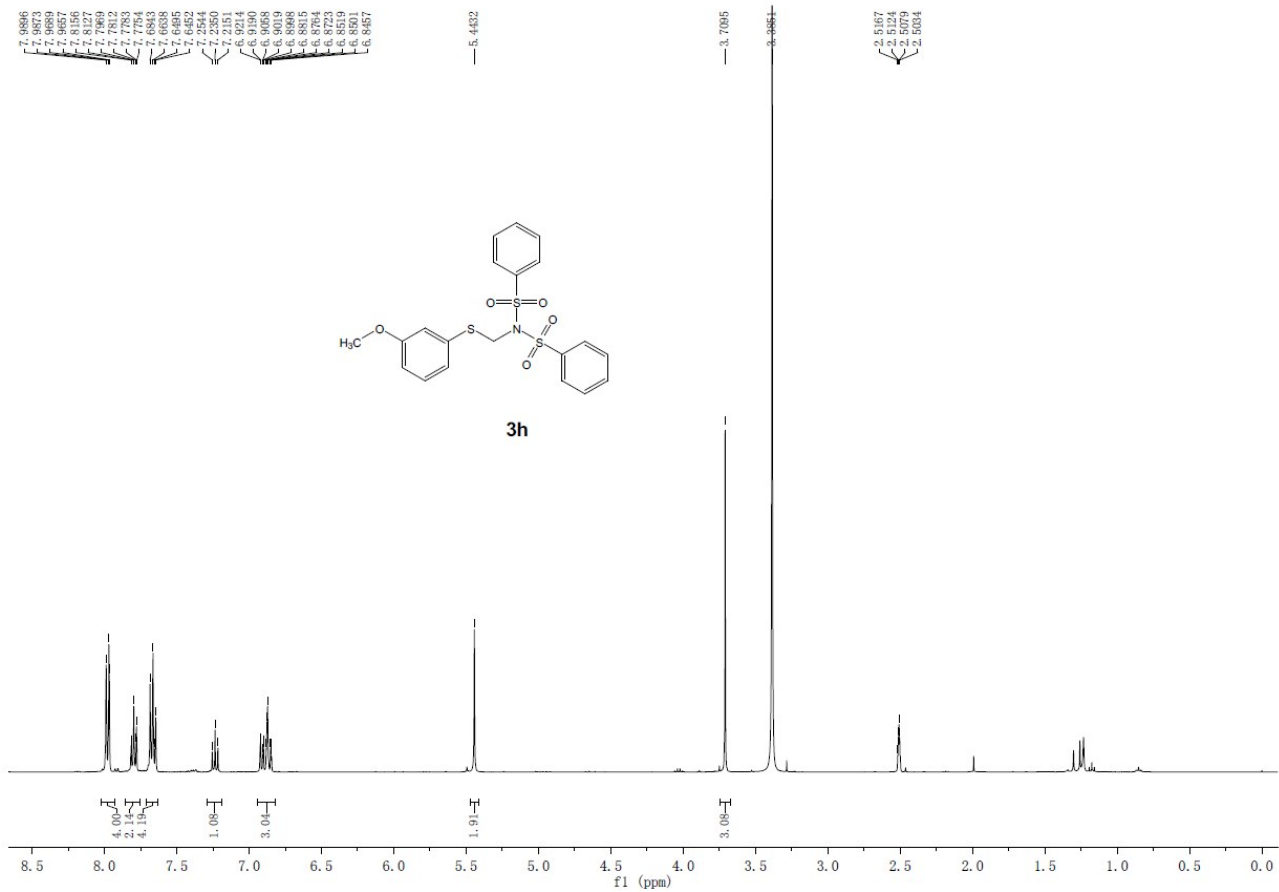


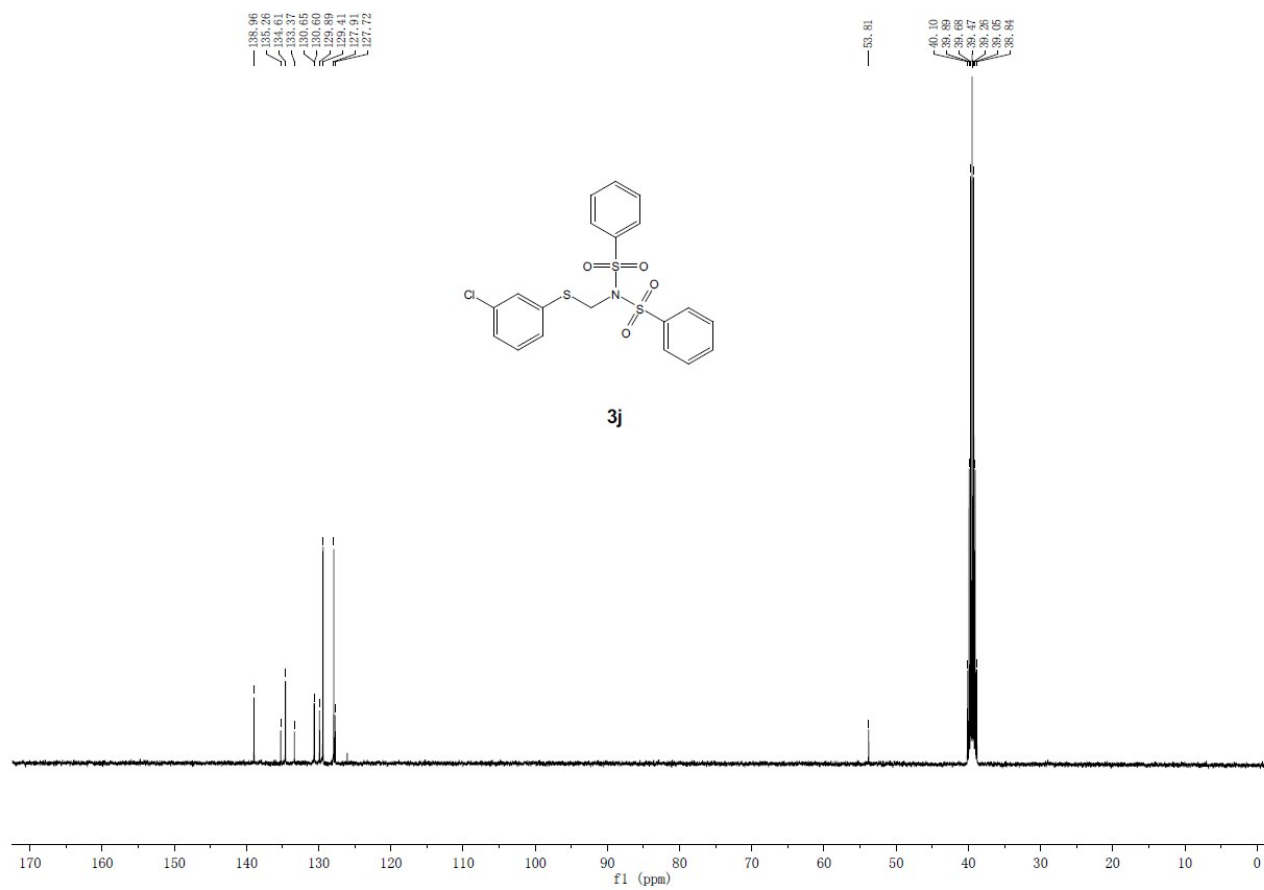
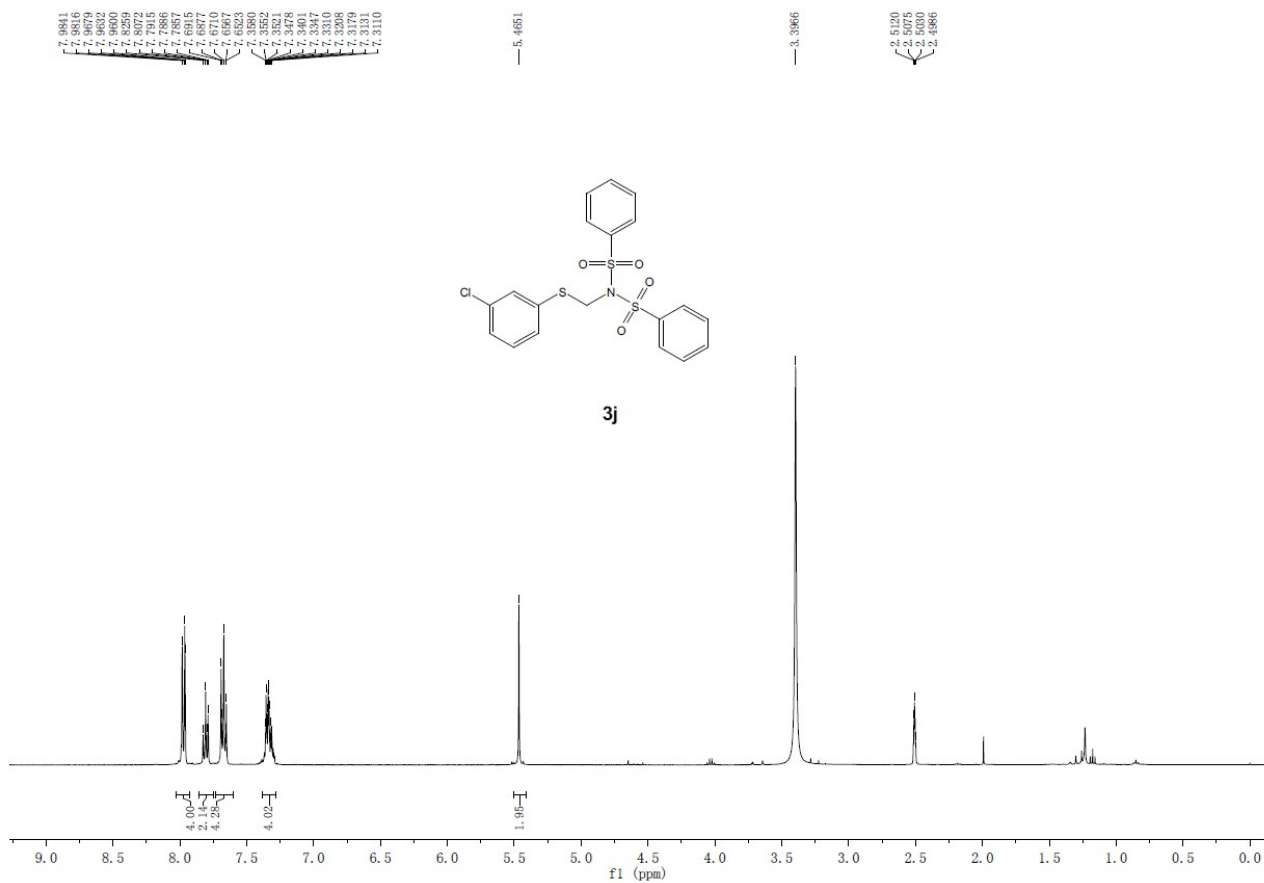


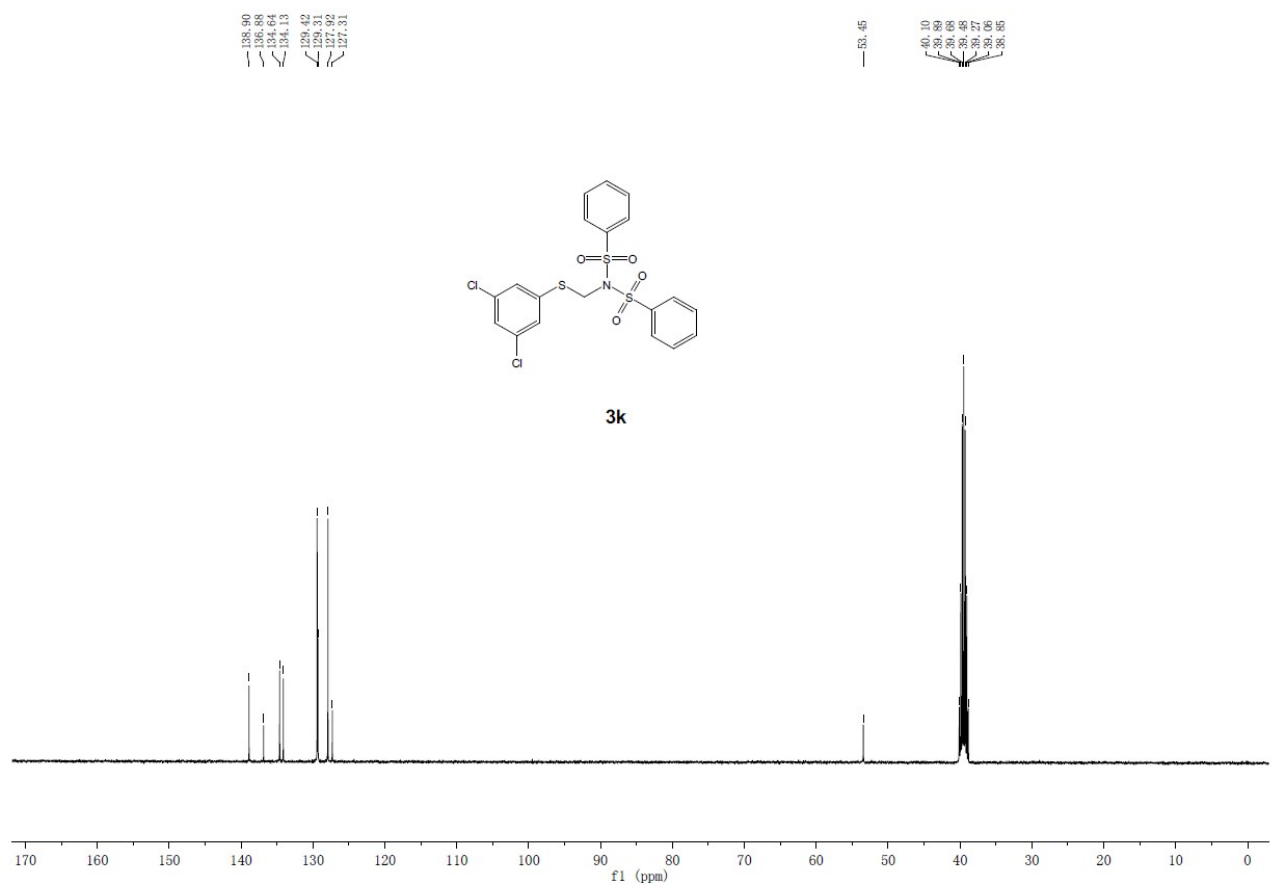


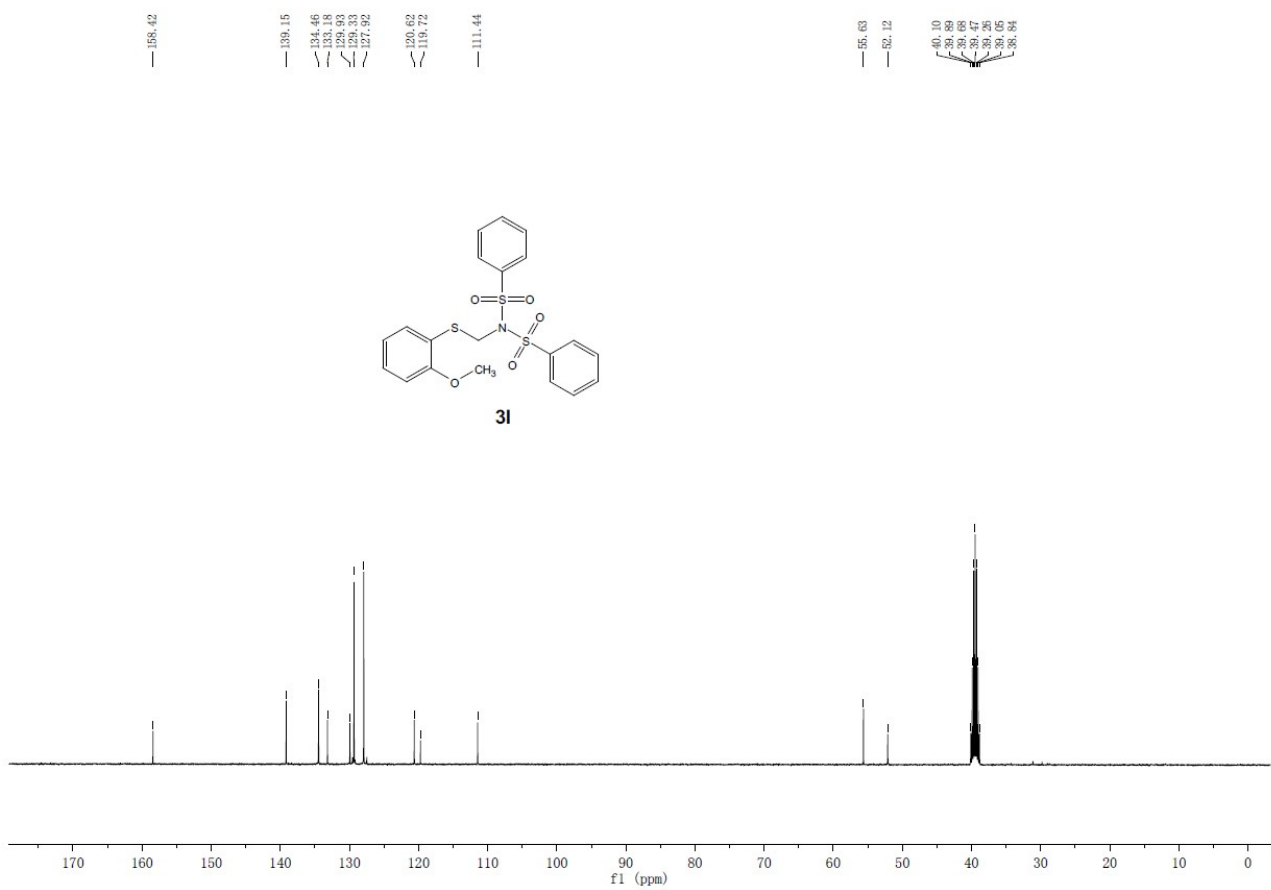
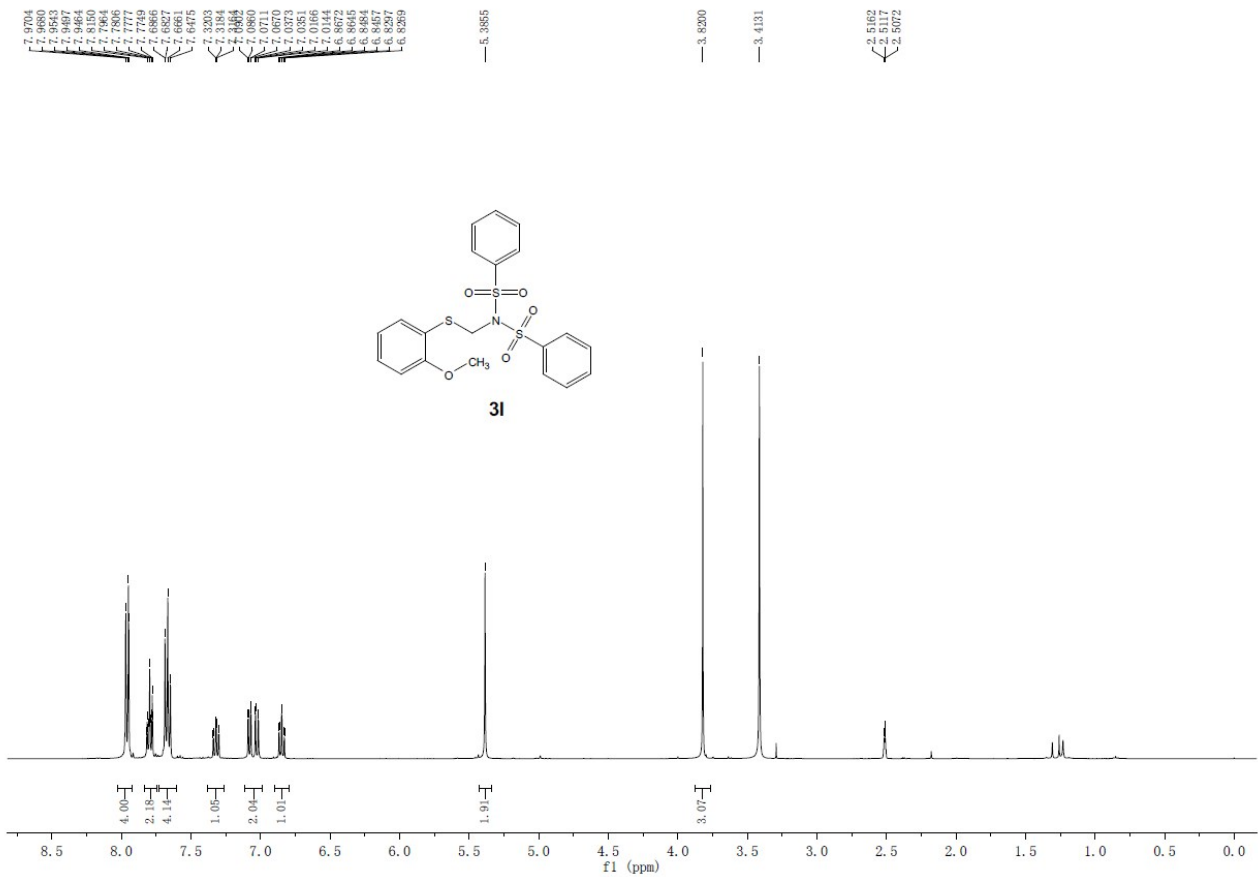










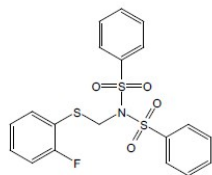


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7.0293
7.8075
7.7904
7.6723
7.2960
7.2891
7.1382

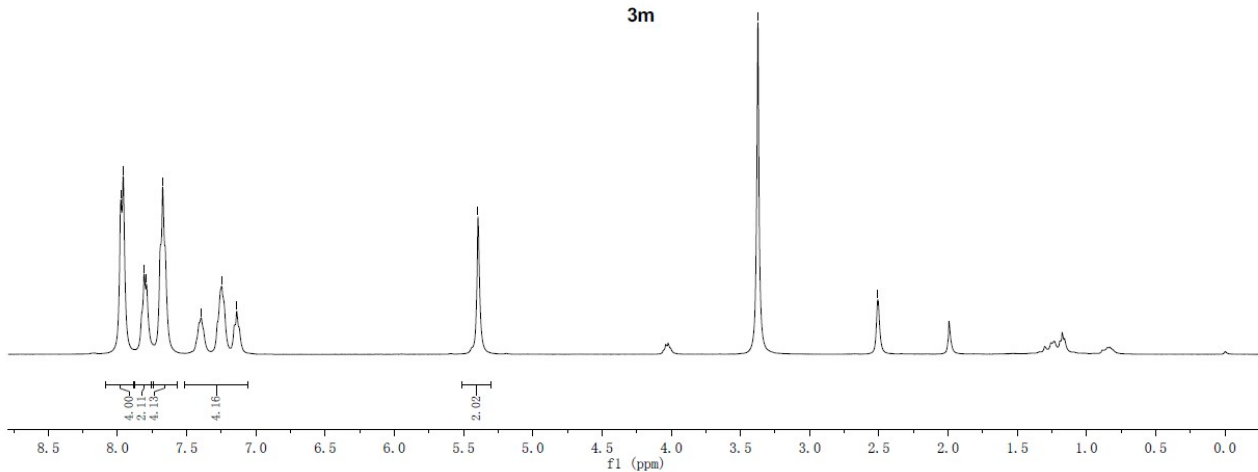
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3.3735

2.5072



3m

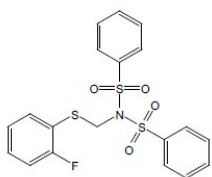


138.93
134.62
134.54
130.38
129.40
127.94
124.92

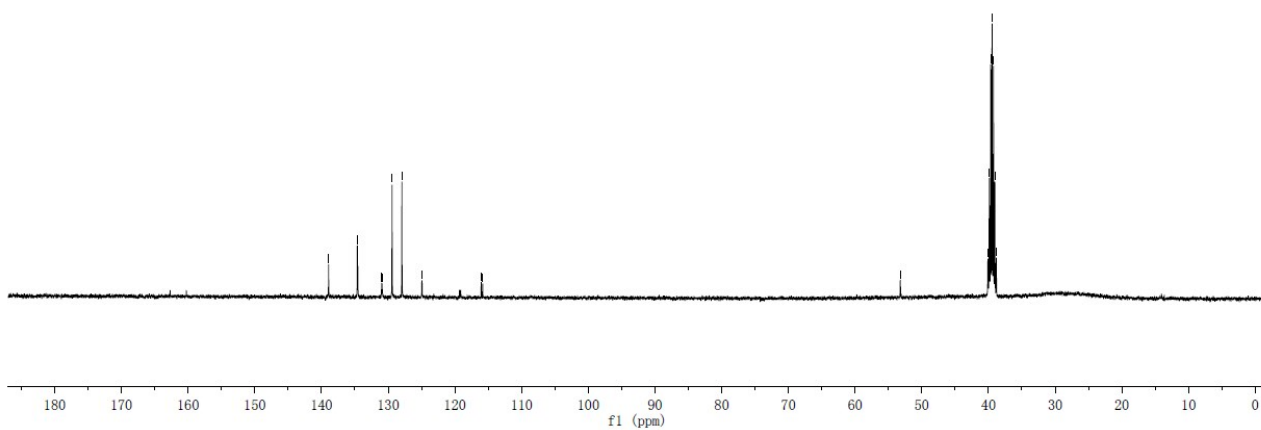
116.05
115.82

53.21

40.07
39.87
39.65
39.24
39.03
38.82



3m

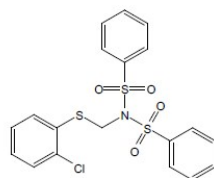


7.9876
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7.9688
7.9658
7.9286
7.8288
7.8209
7.8182
7.8012
7.7883
7.7866
7.7826
7.6888
7.6848
7.6695
7.6559
7.6485
7.6126
7.5071
7.4955
7.4883
7.4315
7.4285
7.4162
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7.3216
7.3177
7.3104
7.3029
7.2988
7.2942

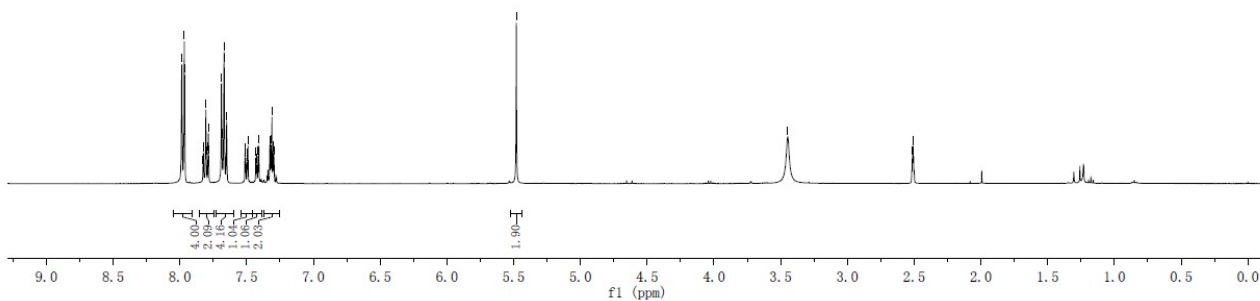
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3.4468

2.5135
2.5069
2.5044



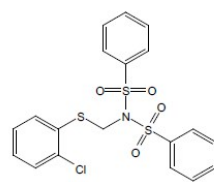
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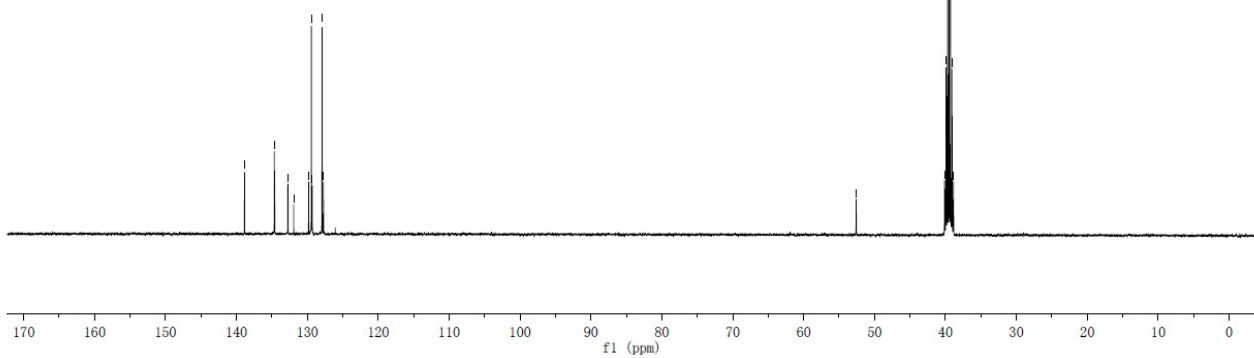
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134.64
133.80
132.72
131.92
129.81
129.43
127.92
127.72

52.89

40.12
38.91
38.40
38.28
38.07
38.57

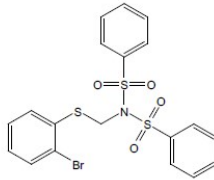


3n

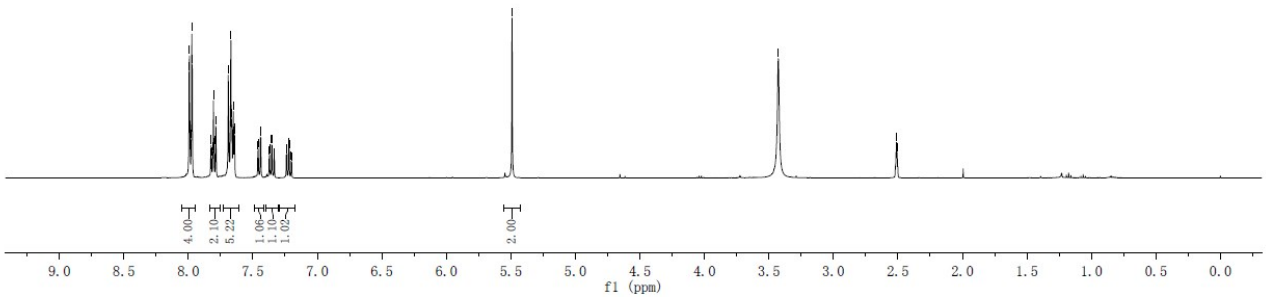


7.9698
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7.9730
7.9878
7.9887
7.8249
7.8211
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7.8033
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7.7865
7.7866
7.7638
7.6953
7.6966
7.6643
7.6607
7.6554
7.6440
7.6408
7.4613
4.5714
4.4377
3.3732
3.3694
3.3516
3.3514
3.3318
3.2408
2.2213
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-5.4807

-3.4271
2.5146
2.5101
2.5066

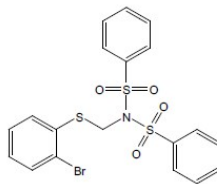


3o

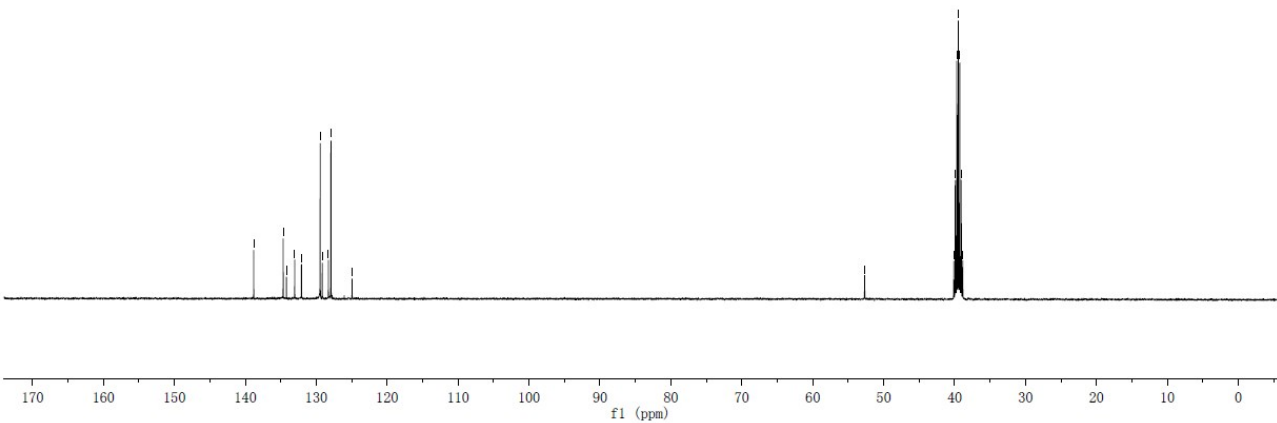


138.81
134.66
133.04
132.08
129.44
129.15
127.93
124.95

-52.68
40.11
38.90
38.65
38.27
38.06
38.85



3o

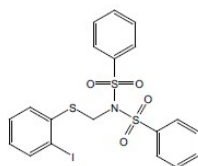


8.0450
8.0027
7.9843
7.9811
7.8286
7.8099
7.8025
7.7875
7.7341
7.7312
7.7281
7.7266
7.6942
7.6737
7.6593
7.6550
7.5282
7.5262
7.5263
7.5263

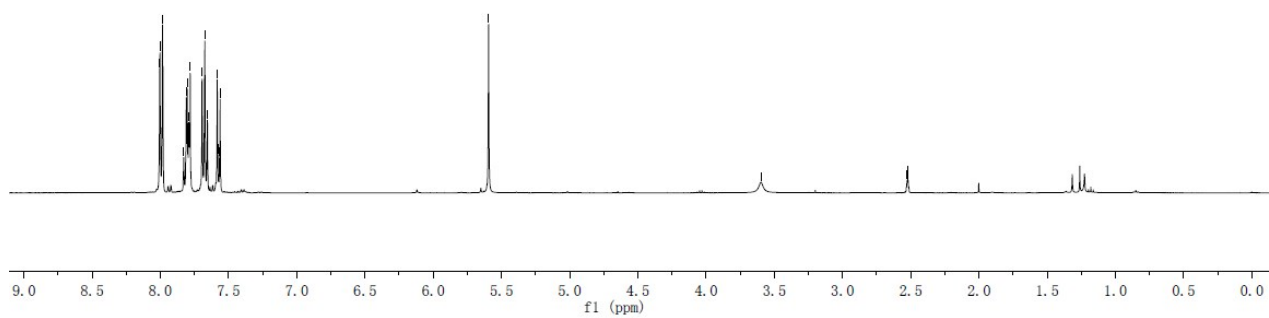
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3.5381

2.5274
2.5274
2.5385



3p



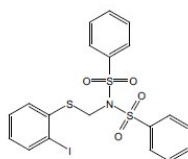
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138.75
134.69
132.54
130.70
129.45
127.90

118.51

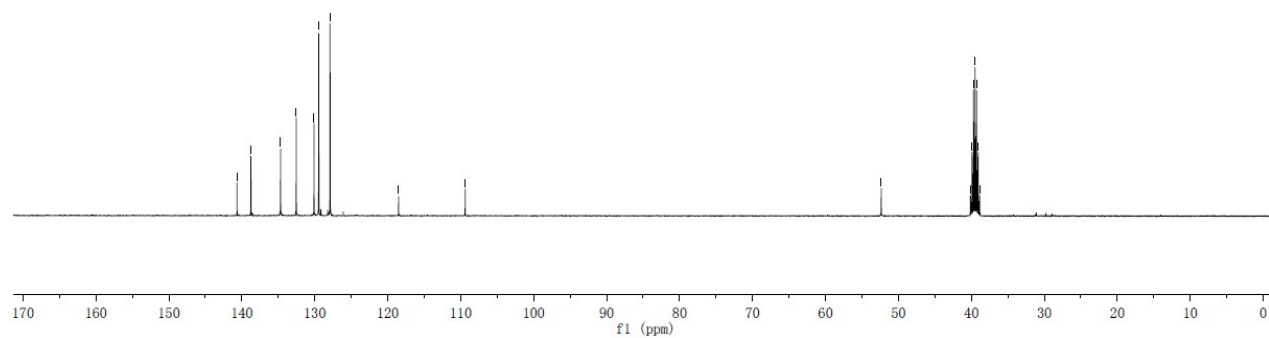
109.38

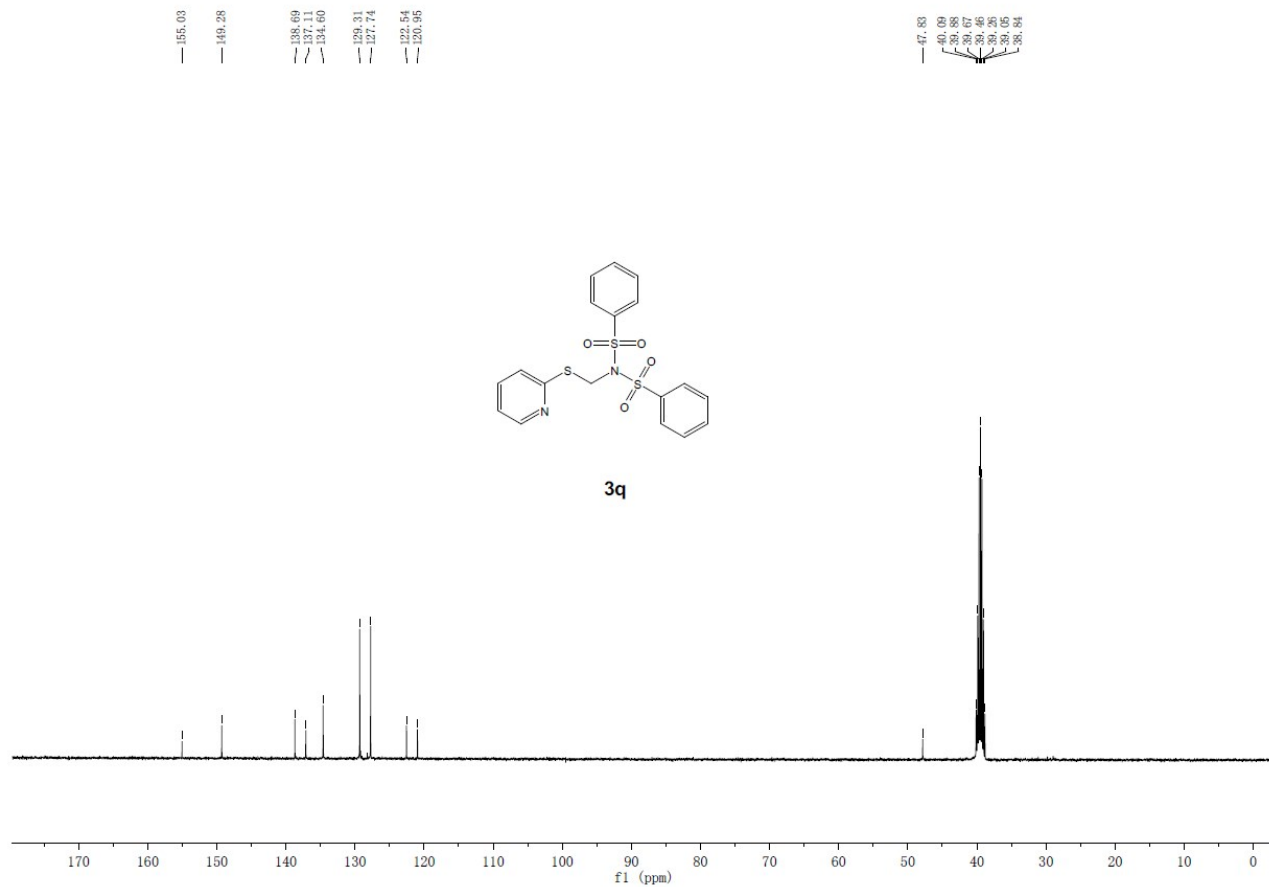
62.35

40.12
39.91
39.70
39.49
39.28
39.07
38.86



3p



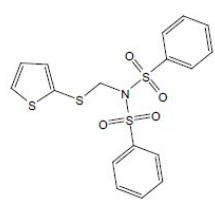


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8.0191
8.0155
8.0135
7.8353
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7.8124
7.8091
7.7981
7.7952
7.7173
7.7134
7.6998
7.6828
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7.6790
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7.6316
7.6272
7.0152
6.9524
6.9466
6.9434

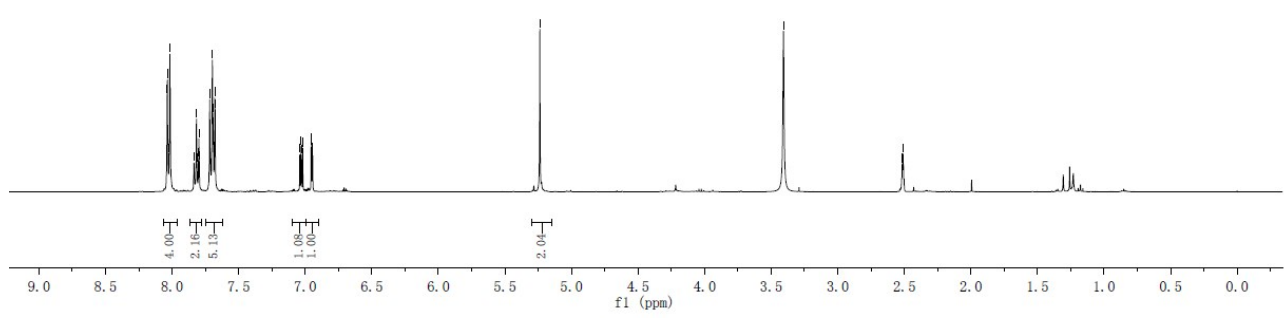
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3.4077

2.5157
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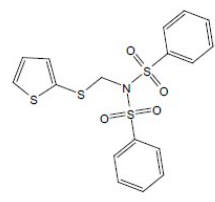
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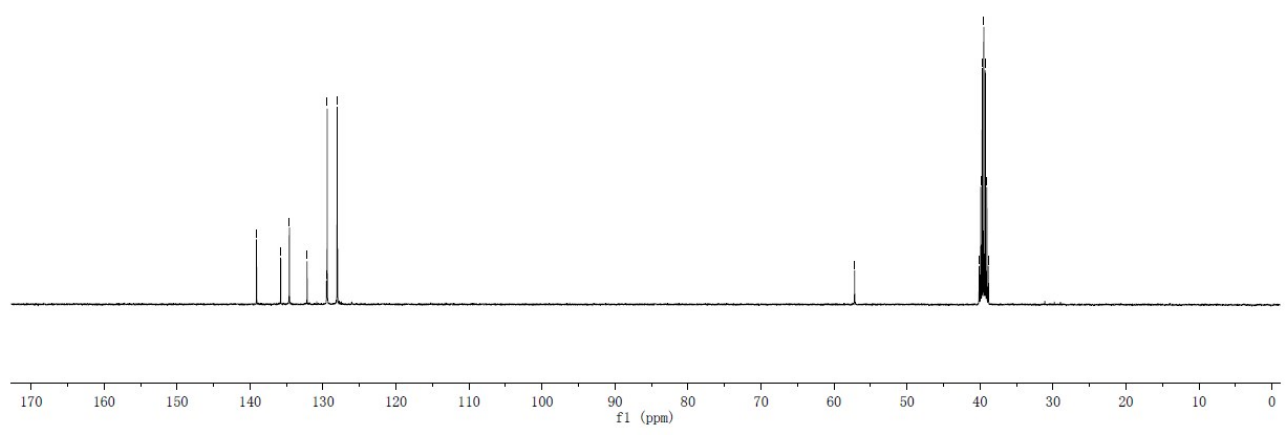
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129.43
128.97
127.99

57.17

40.10
39.80
39.69
39.48
39.27
38.85



3r



8.0569
8.0386
7.8104
7.7918
7.7732
7.6800
7.6614

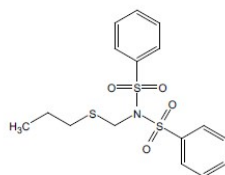
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3.5198

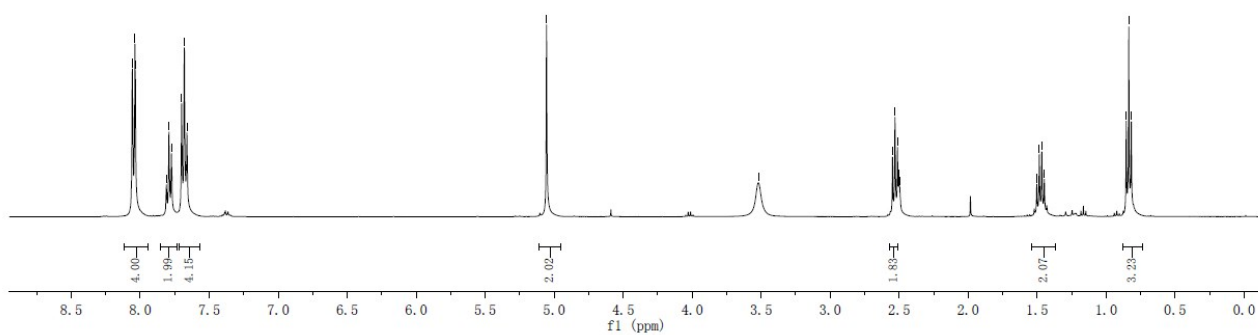
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2.4864

1.5691
1.4859
1.4477

0.8537
0.8355
0.8171



5a

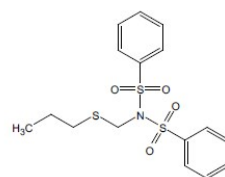


139.25
134.44
129.37
127.90

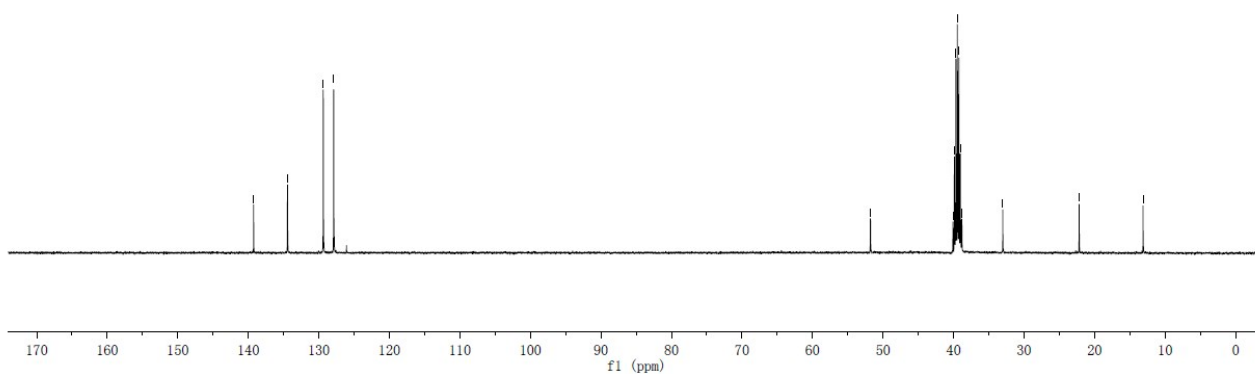
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38.83
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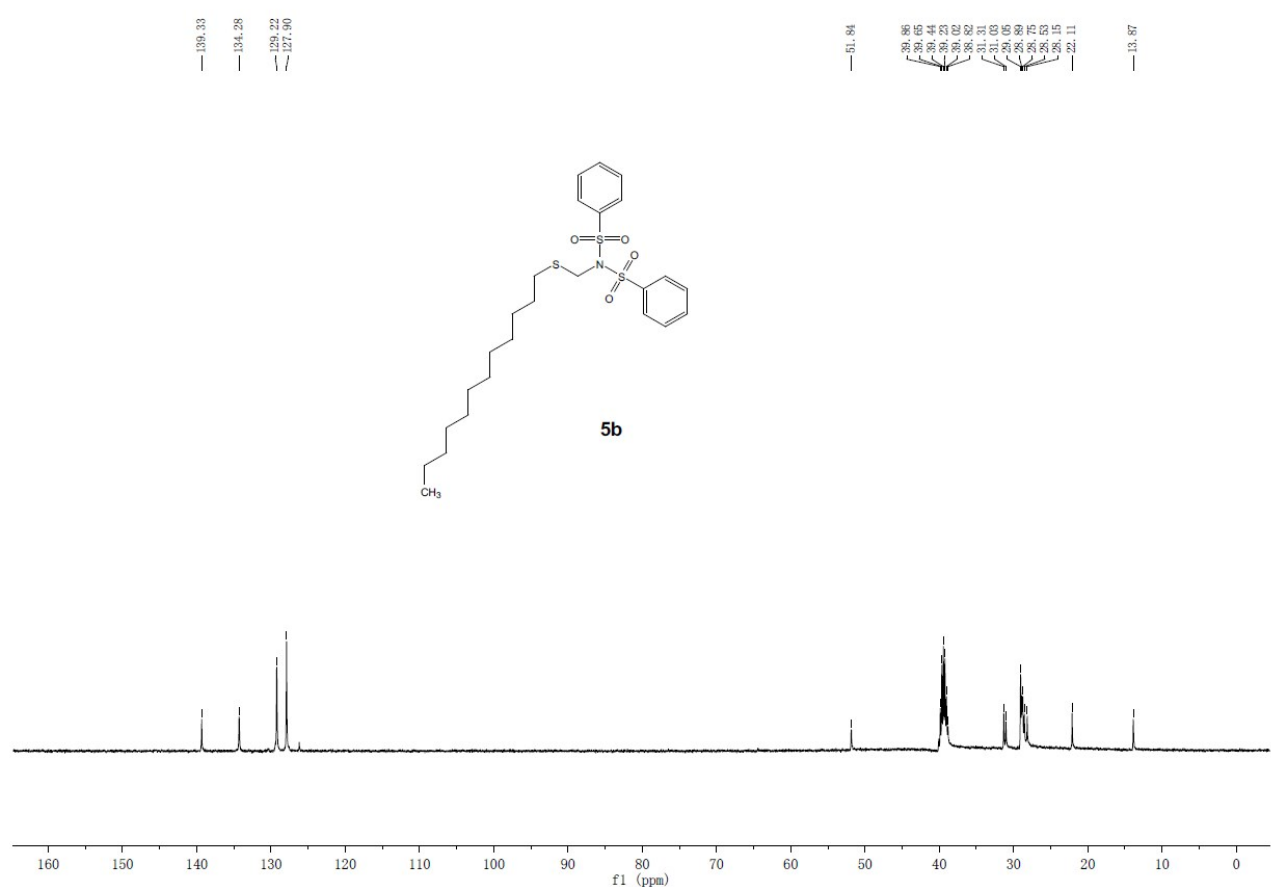
22.19

13.12



5a





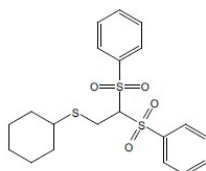
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7.7589
7.7588
7.6644
7.6603

5.0927

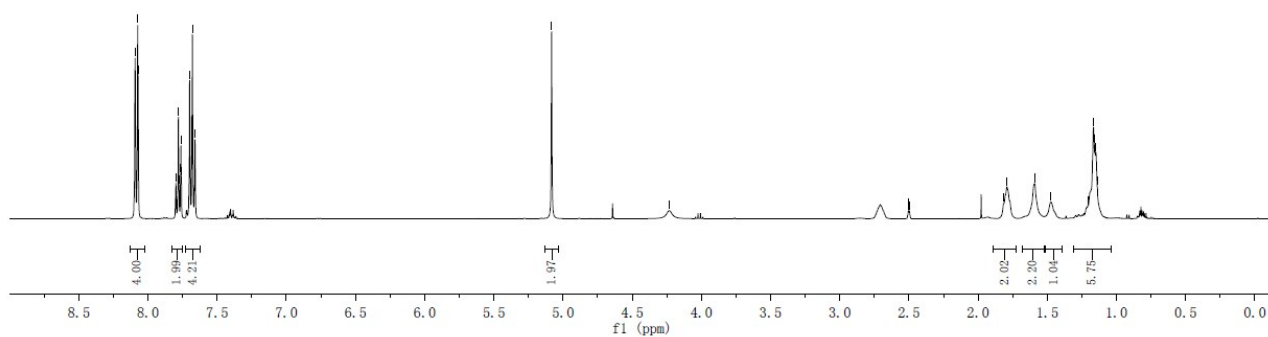
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1.1351

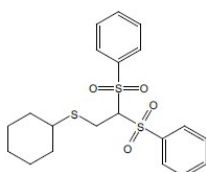


5c

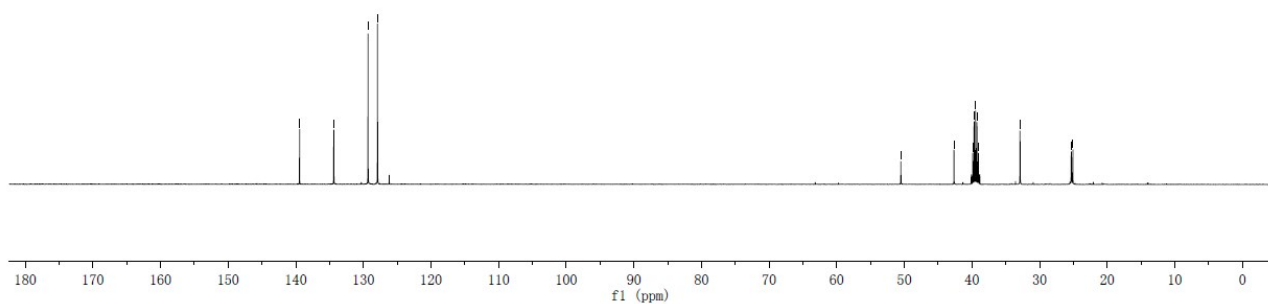


138.43
134.37
128.31
127.90

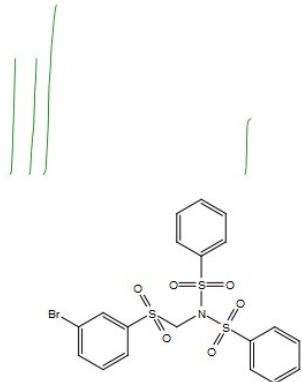
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32.88
25.30
25.07



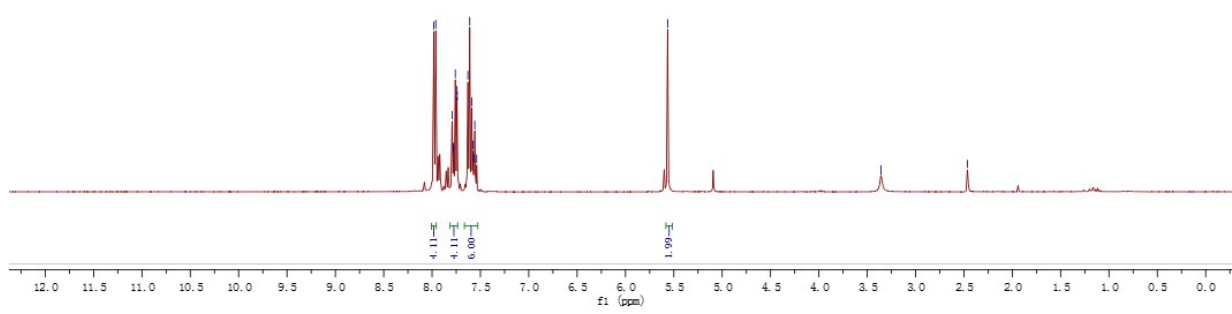
5c



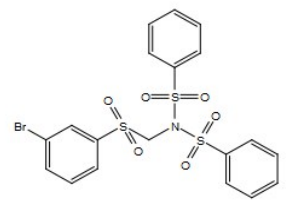
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7.5688
7.5655
7.5387
5.5641
3.3009
2.4033



6



139.80
138.63
137.90
135.46
129.83
129.11
128.94
128.29
122.63
67.60
40.48
40.27
39.85
39.04



6

