

## Supporting Information

### Approach to Thiazole Containing Thiazole-Containing Tetrahydropyridines via Aza-Rauhut-Currier Reaction and Their Potent Biological Fungicidal and Insecticidal Activity

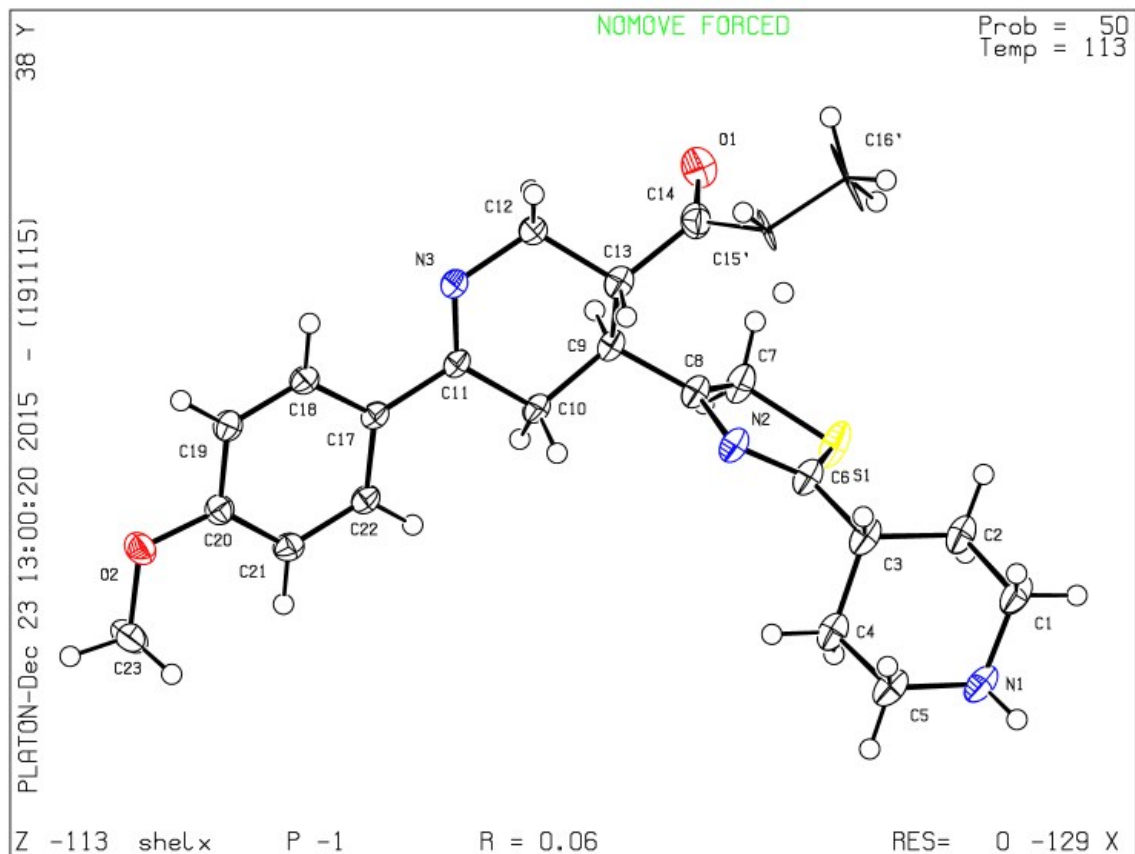
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The single crystals of compound **6** were obtained by slowly evaporating the solvent from the solution in mixed solvent of dichloromethane/petroleum ether.

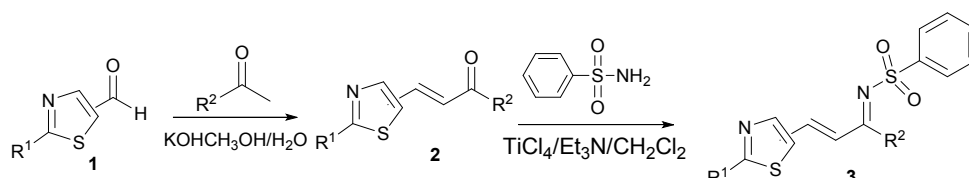


## General Information

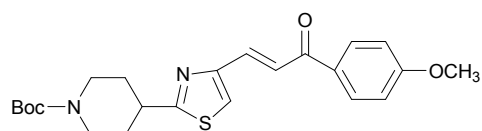
Thiazole aldehydes **1** and vinyl ketones were commercially available. Compounds **2** and **3** were obtained following the reported literature procedure.

## Experimental Data

### Synthesis Route of compounds **3**

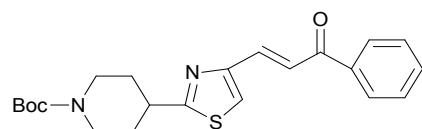


### Structures and physical data of compounds **2**.



Isolated yield of 342 mg (81%), Pale yellow solid: mp 29-30 °C; R<sub>f</sub> =0.55 (2:1 PE: EA). <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz, ppm) δ 8.07 (d, *J* = 8.9 Hz, 2H), 7.87 (d, *J* = 15.1 Hz, 1H), 7.67 (d, *J* = 15.1 Hz, 1H), 7.39 (s, 1H), 6.97 (d, *J* = 8.9 Hz, 2H), 4.21 (br, 2H), 3.87 (s, 3H), 3.22-3.15 (m, 1H), 2.91 (t, *J* = 12.1 Hz, 2H), 2.13 (d, *J* = 12.8 Hz, 2H), 1.78 (qd, *J* = 12.4, 4.1 Hz, 2H), 1.48 (s, 9H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 188.78, 175.46, 163.50, 154.74, 152.12, 135.35, 131.00, 123.74, 121.70, 113.82, 79.74, 55.51, 40.91, 32.35, 28.47. IR (cm<sup>-1</sup>): 3099, 3004, 2974, 2932, 2852, 1690, 1658, 1606, 1421, 1365, 1286, 1259, 1170, 1019. HRMS (ESI-TOF) *m/z* calcd for C<sub>23</sub>H<sub>28</sub>N<sub>2</sub>NaO<sub>4</sub>S [M + Na<sup>+</sup>] 451.1667, found 451.1668.

### (E)-tert-Butyl 4-(4-(3-oxo-3-phenylprop-1-en-1-yl)thiazol-2-yl)piperidine-1-carboxylate (**2b**).

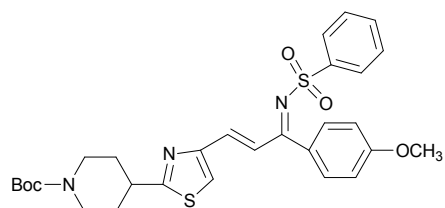


Isolated yield 221mg (83%). Pale yellow solid. mp 30-32°C; R<sub>f</sub> =0.51 (2:1 PE: EA). <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz, ppm) δ 8.00 (d, *J* = 7.6 Hz, 2H), 7.81 (d, *J* = 15.1 Hz, 1H), 7.63 (d, *J* = 15.1 Hz, 1H), 7.52 (t, *J* = 7.2 Hz, 1H), 7.44 (t, *J* = 7.5 Hz, 2H), 7.36 (s, 1H), 4.16 (br, 2H), 3.18 – 3.09 (m, 1H), 2.90 – 2.78 (m, 2H), 2.07 (d, *J* = 12.6 Hz, 2H), 1.75-

1.65(m, 2H), 1.41 (s, 9H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  188.78, 175.46, 163.50, 157.15, 154.74, 152.12, 135.35, 130.97, 123.74, 121.70, 113.82, 79.74, 55.51, 40.91, 28.47; IR ( $\text{cm}^{-1}$ ): 3098, 2973, 2928, 2853, 1691, 1605, 1478, 1447, 1422, 1365, 1280, 1232, 1167, 1014. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{22}\text{H}_{26}\text{N}_2\text{NaO}_3\text{S}$  [ $\text{M} + \text{Na}^+$ ] 421.1562, found 421.1561.

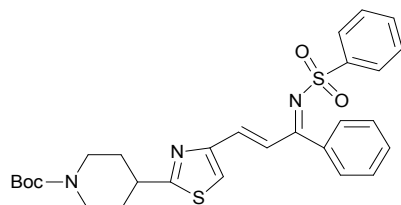
### Structures and physical data of compounds 3.

#### **tert-Butyl 4-(4-((1E,3Z)-3-(4-methoxyphenyl)-3-((phenylsulfonyl)imino)prop-1-en-1-yl)thiazol-2-yl)piperidine-1-carboxylate (3a).**



Isolated yield 106 mg (80%). Pale yellow oil;  $R_f$  =0.20 (2:1 PE: EA).  $^1\text{NMR}$  ( $\text{CDCl}_3$ , 400 MHz, ppm)  $\delta$  8.06 (d,  $J$  = 7.6 Hz, 2H), 7.72 (d,  $J$  = 8.5 Hz, 2H), 7.61 – 7.46 (m, 4H), 7.39 (s, 1H), 7.02 (d,  $J$  = 15.6 Hz, 1H), 6.94 (d,  $J$  = 8.6 Hz, 2H), 4.24 (br, 2H), 3.88 (s, 3H), 3.26 – 3.17 (m, 1H), 2.92 (br, 2H), 2.16 (d,  $J$  = 12.1 Hz, 2H), 1.83-1.73 (m, 2H), 1.50 (s, 9H);  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 100 MHz)  $\delta$  177.05, 175.55, 163.33, 154.73, 151.57, 141.78, 138.08, 133.15, 132.50, 128.76, 128.60, 128.33, 127.18, 121.83, 113.87, 79.73, 55.86, 40.79, 32.24, 28.47; IR ( $\text{cm}^{-1}$ ): 3101, 2973, 2930, 1690, 1588, 1567, 1477, 1423, 1365, 1289, 1275, 1233, 1168, 1134, 1106. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{29}\text{H}_{33}\text{N}_3\text{O}_5\text{S}_2\text{H}$  [ $\text{M} + \text{H}^+$ ], 567.1862 found 568.1930.

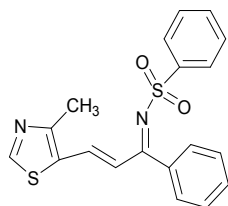
#### **tert-Butyl 4-(4-((1E,3Z)-3-phenyl-3-((phenylsulfonyl)imino)prop-1-en-1-yl)thiazol-2-yl)piperidine-1-carboxylate (3b).**



Isolated yield 110 mg (70%). Pale yellow oil;  $R_f$  =0.50 (2:1 PE: EA).  $^1\text{NMR}$  ( $\text{CDCl}_3$ , 400 MHz, ppm)  $\delta$  7.97 (br, 2H), 7.86 (d,  $J$  = 7.7 Hz, 1H), 7.57– 7.44 (m, 6H), 7.38-7.33(m, , 2H), 7.19 (s, 1H), 6.93 (d,  $J$  = 15.5 Hz, 1H), 4.15 (br, 2H), 3.13 (t,  $J$  = 11.4 Hz, 1H), 2.83

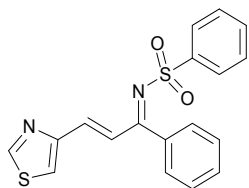
(br, 2H), 2.07 (d,  $J = 12.4$  Hz, 2H), 1.71 (d,  $J = 12.1$  Hz, 2H), 1.41 (s, 9H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  175.73, 154.73, 151.51, 141.52, 140.38, 137.74, 132.72, 132.66, 129.13, 128.82, 128.41, 127.24, 126.41, 122.23, 79.75, 40.80, 32.24, 28.47; IR ( $\text{cm}^{-1}$ ): 3091, 3065, 2954, 2924, 2852, 1684, 1608, 1545, 1457, 1446, 1365, 1317, 1234, 1157. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{28}\text{H}_{31}\text{N}_3\text{NaO}_4\text{S}_2$  [ $\text{M} + \text{Na}^+$ ] 560.1654, found 560.1651.

**(Z)-N-((E)-3-(4-Methylthiazol-5-yl)-1-phenylallylidene) benzenesulfonamide (3d)**



Isolated yield 128 mg (81%). Pale yellow solid: mp 29-31°C;  $R_f = 0.50$  (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.82 (s, 1H), 8.05 (d,  $J = 6.3$  Hz, 2H), 7.94 (d,  $J = 7.6$  Hz, 1H), 7.66 (s, 1H), 7.61-7.48 (m, 5H), 7.48 (t,  $J = 7.6$  Hz, 2H), 7.25 (d,  $J = 15.6$  Hz, 1H), 2.44 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  157.15, 154.48, 141.41, 137.87, 132.77, 129.14, 128.89, 128.51, 127.15, 15.82; IR ( $\text{cm}^{-1}$ ): 3435, 3079, 2953, 2915, 2847, 2309, 1594, 1535, 1443, 1304, 1246, 1148, 1082, 1011, 939, 820, 725, 687, 640; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{19}\text{H}_{17}\text{N}_2\text{O}_2\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 369.0731, found 369.0728.

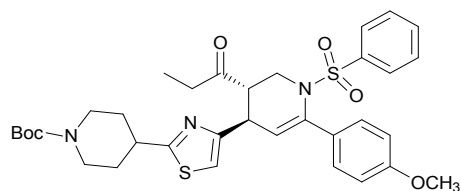
**(Z)-N-((E)-1-Phenyl-3-(thiazol-4-yl)allylidene)benzenesulfonamide (3e).**



Isolated yield 127 mg (77%). Pale yellow oil;  $R_f = 0.29$  (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.88 (s, 1H), 8.05 (d,  $J = 7.0$  Hz, 2H), 7.66 (d,  $J = 5.8$  Hz, 2H), 7.54 (dt,  $J = 14.6$ , 5.4 Hz, 6H), 7.44 (t,  $J = 7.6$  Hz, 2H), 7.12 (d,  $J = 15.7$  Hz, 1H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  154.01, 152.66, 141.46, 139.70, 132.72, 128.85, 128.47, 127.25, 122.30; IR ( $\text{cm}^{-1}$ ): 2954, 2923, 2852, 1607, 1528, 1463, 1446, 1308, 1150. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{18}\text{H}_{15}\text{N}_2\text{O}_2\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 355.0575, found 355.0570.

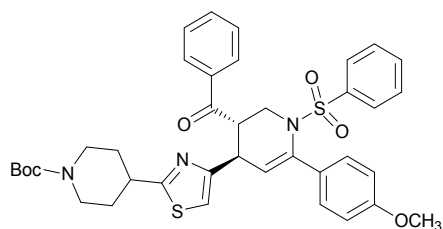
**Structures and physical data of compounds 5.**

**tert-Butyl-4-(4-((3S,4R)-6-(4-methoxyphenyl)-1-(phenylsulfonyl)-3-propionyl-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5aa).**



Isolated yield 85 mg (74%). Pale yellow oil;  $R_f = 0.42$  (2:1 PE: EA).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.62 (d,  $J = 7.8$  Hz, 2H), 7.49 (t,  $J = 7.1$  Hz, 1H), 7.40 (t,  $J = 7.3$  Hz, 2H), 7.27 (d,  $J = 8.0$  Hz, 2H), 6.78 (d,  $J = 8.2$  Hz, 2H), 6.62 (s, 1H), 5.54 (d,  $J = 2.2$  Hz, 1H), 4.30 (d,  $J = 13.3$  Hz, 1H), 4.15 (br, 2H), 4.06 (d,  $J = 9.7$  Hz, 1H), 3.79 (s, 3H), 3.32 (t,  $J = 12.8$  Hz, 1H), 2.99 (t,  $J = 11.5$  Hz, 1H), 2.85 (t,  $J = 11.1$  Hz, 2H), 2.71 (t,  $J = 11.1$  Hz, 1H), 2.52 – 2.38 (m, 1H), 2.27 – 2.16 (m, 1H), 1.97 (d,  $J = 11.8$  Hz, 2H), 1.66–1.58 (m, 2H), 1.46 (s, 9H), 0.96 (t,  $J = 7.2$  Hz, 3H);  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  210.70, 174.11, 159.72, 156.05, 154.71, 139.21, 138.96, 132.84, 130.61, 128.91, 128.72, 127.71, 118.80, 113.28, 112.05, 79.74, 55.29, 49.05, 48.98, 40.43, 39.44, 36.82, 32.23, 32.17, 28.47; IR ( $\text{cm}^{-1}$ ): 2973, 2933, 2855, 1689, 1605, 1511, 1446, 1423, 1365, 1247, 1169, 1124, 1016, 970, 834, 756, 727, 691, 612; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{34}\text{H}_{41}\text{N}_3\text{NaO}_6\text{S}_2$  [ $\text{M} + \text{Na}^+$ ] 674.2334, found 674.2335.

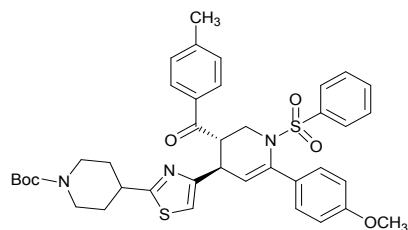
**tert-Butyl 4-(4-((3S,4S)-3-Benzoyl-6-(4-methoxyphenyl)-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5ab).**



Isolated yield 100 mg (83%). Pale yellow oil;  $R_f = 0.30$  (2:1 PE: EA).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.74 (d,  $J = 7.7$  Hz, 2H), 7.67 (d,  $J = 7.8$  Hz, 2H), 7.59 – 7.53 (m, 2H), 7.47 – 7.39 (m, 4H), 7.33 (d,  $J = 8.2$  Hz, 2H), 6.82 (d,  $J = 8.2$  Hz, 2H), 6.70 (s, 1H), 5.68 (d,  $J = 2.8$  Hz, 1H), 4.37 (dd,  $J = 25.8, 12.3$  Hz, 2H), 4.02 (s, 2H), 3.84 (d,  $J = 13.9$  Hz, 4H), 3.49 (t,  $J = 12.7$  Hz, 1H), 2.92 – 2.71 (m, 3H), 1.80 (d,  $J = 12.4$  Hz, 1H), 1.70 (d,  $J = 11.1$  Hz, 2H), 1.48 (s, 9H);  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  173.99, 159.70, 155.69, 154.65, 139.61, 138.91, 136.56, 133.38, 132.85, 130.74, 128.98, 128.70, 128.55, 127.80, 126.43, 119.03, 113.32, 112.22, 79.61, 55.31, 49.66, 44.90, 40.42, 40.17, 31.92,

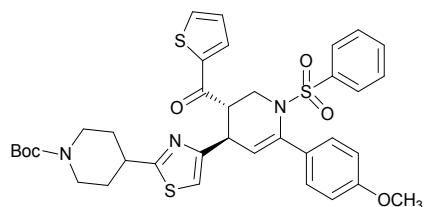
31.82, 28.49; IR (cm<sup>-1</sup>): 2929, 2854, 1682, 1607, 1510, 1447, 1425, 1364, 1288, 1247, 1169, 1032.32, 973, 833, 754, 639, 588; HRMS (ESI-TOF) m / z calcd for C<sub>38</sub>H<sub>42</sub>N<sub>3</sub>O<sub>6</sub>S<sub>2</sub> [M + H<sup>+</sup>] 700.2515, found 700.2521.

**tert-Butyl 4-(4-((3S,4R)-6-(4-methoxyphenyl)-3-(4-methylbenzoyl)-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5ac).**



Isolated yield 82 mg (70%). Pale yellow oil; R<sub>f</sub> = 0.35 (2:1 PE: EA). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.94 (d, J = 7.9 Hz, 1H), 7.69 (d, J = 7.7 Hz, 2H), 7.61 (d, J = 9.7 Hz, 2H), 7.48 (d, J = 7.7 Hz, 2H), 7.34 (d, J = 8.1 Hz, 2H), 7.22 (d, J = 7.7 Hz, 2H), 6.84 (d, J = 8.2 Hz, 2H), 6.70 (s, 1H), 5.68 (s, 1H), 4.41 (d, J = 13.7 Hz, 1H), 4.34 (d, J = 10.3 Hz, 1H), 4.06 (s, 2H), 3.87 – 3.78 (m, 4H), 3.49 (t, J = 12.8 Hz, 1H), 2.94 – 2.75 (m, 4H), 2.43 (s, 3H), 1.85 (s, 2H), 1.74 (d, J = 13.7 Hz, 2H), 1.49 (s, 9H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 199.79, 174.06, 159.65, 155.72, 154.68, 144.42, 139.57, 138.77, 133.98, 132.86, 132.69, 130.77, 129.25, 129.12, 129.00, 128.69, 128.65, 127.80, 126.39, 119.25, 113.30, 112.31, 79.65, 55.31, 49.73, 44.63, 40.36, 40.17, 31.98, 31.84, 28.48, 21.70; IR (cm<sup>-1</sup>): 2954, 2855, 2377, 2347, 1674, 1606, 1510, 1446, 1424, 1343, 1289, 1247, 1167, 1090, 1015, 973, 833., 755, 727, 690, 638, 586; HRMS (ESI-TOF) m / z calcd for C<sub>39</sub>H<sub>43</sub>N<sub>3</sub>NaO<sub>6</sub>S<sub>2</sub> [M + Na<sup>+</sup>] 736.2491, found 735.2488.

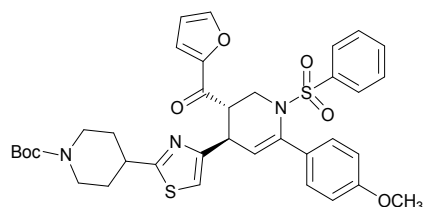
**tert-Butyl 4-(4-((3S,4R)-6-(4-methoxyphenyl)-1-(phenylsulfonyl)-3-(thiophene-2-carbonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5ad).**



Isolated yield 78 mg (79%). Pale yellow oil; R<sub>f</sub> = 0.48 (2:1 PE: EA). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.70 (d, J = 7.8 Hz, 2H), 7.58 (dd, J = 15.6, 8.0 Hz, 2H), 7.47 (t, J = 7.9 Hz, 3H), 7.32 (d, J = 7.6 Hz, 2H), 7.10 (s, 1H), 6.83 (d, J = 7.7 Hz, 2H), 6.73 (s, 1H), 5.69 (s, 1H),

4.49 (d,  $J = 13.7$  Hz, 1H), 4.34 (dd,  $J = 13.8, 7.4$  Hz, 2H), 4.06 (s, 2H), 3.85 (s, 3H), 3.73 (t,  $J = 11.0$  Hz, 1H), 2.94 (t,  $J = 11.0$  Hz, 1H), 2.84 (s, 2H), 1.88 (d,  $J = 11.9$  Hz, 1H), 1.75 (dd,  $J = 14.9, 7.4$  Hz, 2H), 1.50 (s, 9H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  199.79, 174.06, 159.65, 155.72, 154.68, 144.42, 139.57, 138.77, 133.98, 132.86, 132.69, 130.77, 129.25, 129.12, 129.00, 128.69, 128.65, 127.80, 126.39, 119.25, 113.30, 112.31, 79.65, 55.31, 49.73, 44.63, 40.36, 40.17, 31.98, 31.84, 28.48, 21.70; IR ( $\text{cm}^{-1}$ ): 2955, 2925, 2853, 1724, 1687, 1606, 1510, 1463, 1416, 1355, 1288, 1246, 1167, 1126. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{36}\text{H}_{39}\text{N}_3\text{NaO}_6\text{S}_3$  [ $\text{M} + \text{Na}^+$ ] 728.1899, found 728.1896.

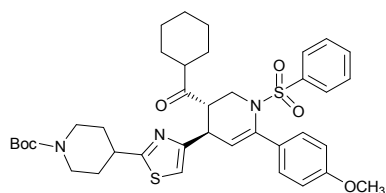
**tert-Butyl 4-(4-((3S,4R)-3-(furan-2-carbonyl)-6-(4-methoxyphenyl)-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5ae).**



Isolated yield 88 mg (71%). Pale yellow oil;  $R_f = 0.33$  (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.71 (d,  $J = 7.8$  Hz, 2H), 7.66 – 7.59 (m, 3H), 7.50 – 7.42 (m, 4H), 7.33 (s, 3H), 7.22 (d,  $J = 7.8$  Hz, 2H), 6.73 (s, 1H), 5.78 (d,  $J = 2.8$  Hz, 1H), 4.39 (t,  $J = 15.6$  Hz, 2H), 4.06 (s, 2H), 3.84 (t,  $J = 10.8$  Hz, 1H), 3.52 (t,  $J = 12.8$  Hz, 1H), 2.95 – 2.75 (m, 3H), 2.43 (s, 3H), 1.86 (d,  $J = 12.9$  Hz, 1H), 1.75 (d,  $J = 12.2$  Hz, 1H), 1.51 (s, 9H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  175.61, 154.74, 151.58, 147.09, 141.78, 139.07, 135.38, 132.50, 130.99, 129.14, 128.87, 128.76, 127.84, 127.19, 126.42, 123.73, 121.55, 113.83, 113.31, 79.76, 55.56, 40.81, 32.25, 28.47; IR ( $\text{cm}^{-1}$ ): 2954, 2921, 2850, 1684, 1603, 1522, 1509, 1464, 1152, 1009, 947. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{36}\text{H}_{40}\text{N}_3\text{O}_7\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 690.2308, found 690.2294.

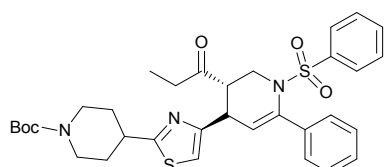
**tert-Butyl 4-(4-((3S,4R)-3-(cyclohexanecarbonyl)-6-(4-methoxyphenyl)-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5af).**





Isolated yield 82 mg (68%). Pale yellow oil;  $R_f = 0.55$  (2:1 PE: EA).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.70 (d,  $J = 7.3$  Hz, 2H), 7.56 (t,  $J = 7.4$  Hz, 1H), 7.46 (t,  $J = 7.7$  Hz, 2H), 7.33 (d,  $J = 8.7$  Hz, 2H), 6.82 (d,  $J = 8.7$  Hz, 2H), 6.67 (s, 1H), 5.53 (d,  $J = 3.4$  Hz, 1H), 4.32 (dd,  $J = 14.0, 3.1$  Hz, 1H), 4.21 (s, 2H), 4.06 (dd,  $J = 10.2, 3.3$  Hz, 1H), 3.82 (s, 3H), 3.31 (dd,  $J = 13.9, 11.8$  Hz, 1H), 3.03 (tt,  $J = 11.5, 3.7$  Hz, 1H), 2.85 (dd,  $J = 11.0, 2.4$  Hz, 3H), 2.17 (d,  $J = 8.2$  Hz, 1H), 2.00 – 1.94 (m, 2H), 1.78 (d,  $J = 7.5$  Hz, 2H), 1.65 (d,  $J = 2.9$  Hz, 2H), 1.50 (s, 9H), 1.28 – 1.13 (m, 5H), 0.99 – 0.82 (m, 5H);  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  213.03, 174.05, 159.66, 155.88, 154.67, 139.22, 138.79, 132.85, 130.75, 128.93, 128.70, 127.80, 119.21, 113.26, 112.58, 79.73, 55.26, 51.47, 49.34, 47.64, 40.55, 39.97, 32.30, 28.47, 27.63, 27.50, 25.71, 25.51; IR ( $\text{cm}^{-1}$ ): 3107, 3060, 2931, 2854, 1692, 1607, 1576, 1510, 1447, 1424, 1364, 1289, 1247, 1090, 1013, 997, 833, 729, 639; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{38}\text{H}_{48}\text{N}_3\text{O}_6\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 706.2985, found 706.2990.

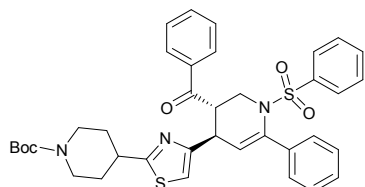
**tert-Butyl 4-(4-((3S,4S)-6-phenyl-1-(phenylsulfonyl)-3-propionyl-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5ba).**



Isolated yield 102 mg (88%). Pale yellow oil;  $R_f = 0.55$  (2:1 PE: EA).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.66 (d,  $J = 7.8$  Hz, 2H), 7.50 (t,  $J = 7.3$  Hz, 1H), 7.41 (t,  $J = 7.0$  Hz, 4H), 7.28 (s, 3H), 6.65 (s, 1H), 5.64 (d,  $J = 2.7$  Hz, 1H), 4.29 (d,  $J = 13.7$  Hz, 1H), 4.16 (br, 2H), 4.06 (d,  $J = 10.0$  Hz, 1H), 3.34 (t,  $J = 12.8$  Hz, 1H), 2.99 (t,  $J = 11.3$  Hz, 1H), 2.86 (br, 2H), 2.64 (t,  $J = 10.7$  Hz, 1H), 2.49-2.39 (m, 1H), 2.25 – 2.13 (m, 1H), 1.96 (d,  $J = 11.3$  Hz, 2H), 1.68 – 1.56 (m, 2H), 1.48 (s, 9H), 0.96 (t,  $J = 7.1$  Hz, 3H);  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  210.50, 174.04, 155.73, 154.66, 139.28, 138.92, 138.29, 132.95, 129.01, 128.27, 127.87, 127.68, 127.37, 120.29, 112.18, 79.64, 48.92, 48.67, 40.34, 39.43, 36.75, 32.17, 32.14, 28.47; IR ( $\text{cm}^{-1}$ ): 2974, 2930, 2871, 2377, 2310, 1689, 1513, 1446,

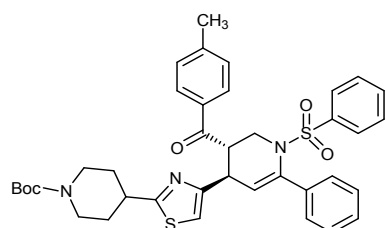
1423, 1364, 1290, 1270, 1234, 1168, 1090, 1012, 971, 853, 815, 729, 691; HRMS (ESI-TOF)  $m/z$  calcd for  $C_{33}H_{39}N_3NaO_5S_2$  [ $M + Na^+$ ] 644.2229, found 644.2228.

**tert-Butyl 4-(4-((3S,4R)-3-benzoyl-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate(5bb).**



Isolated yield 86 mg (68%). Pale yellow oil;  $R_f$  = 0.40 (2:1 PE: EA).  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.74 (d,  $J$  = 7.6 Hz, 2H), 7.68 (d,  $J$  = 7.6 Hz, 2H), 7.57 (dd,  $J$  = 15.8, 8.0 Hz, 2H), 7.42 (dd,  $J$  = 13.2, 6.0 Hz, 6H), 7.30 (d,  $J$  = 4.8 Hz, 3H), 6.73 (s, 1H), 5.77 (d,  $J$  = 2.0 Hz, 1H), 4.38 (t,  $J$  = 13.1 Hz, 2H), 4.03 (s, 2H), 3.86 (t,  $J$  = 10.7 Hz, 1H), 3.50 (t,  $J$  = 12.7 Hz, 1H), 2.93 – 2.69 (m, 3H), 1.81 (d,  $J$  = 12.7 Hz, 1H), 1.71 (d,  $J$  = 12.6 Hz, 2H), 1.48 (s, 9H);  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  200.23, 174.04, 155.45, 154.64, 139.48, 139.23, 138.29, 136.49, 133.43, 132.93, 129.04, 128.57, 128.30, 127.95, 127.81, 127.37, 120.41, 112.33, 79.62, 49.61, 44.73, 40.41, 40.17, 31.92, 31.82, 28.49; IR ( $cm^{-1}$ ): 3059, 2974, 2929, 2857, 1685, 1597, 1514, 1447, 1425, 1364, 1266, 1232, 986, 762, 730, 692; HRMS (ESI-TOF)  $m/z$  calcd for  $C_{37}H_{39}N_3NaO_5S_2$  [ $M + Na^+$ ] 692.2229, found 692.2225.

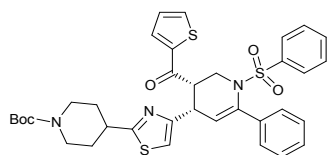
**tert-Butyl 4-(4-((3S,4R)-3-(4-methylbenzoyl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5bc).**



Isolated yield 85 mg (70%). Pale yellow oil;  $R_f$  = 0.49 (2:1 PE: EA).  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.71 (d,  $J$  = 7.8 Hz, 2H), 7.66 – 7.59 (m, 3H), 7.50 – 7.42 (m, 4H), 7.33 (s, 3H), 7.22 (d,  $J$  = 7.8 Hz, 2H), 6.73 (s, 1H), 5.78 (d,  $J$  = 2.8 Hz, 1H), 4.39 (t,  $J$  = 15.6 Hz, 2H), 4.06 (s, 2H), 3.84 (t,  $J$  = 10.8 Hz, 1H), 3.52 (t,  $J$  = 12.8 Hz, 1H), 2.95 – 2.75 (m, 3H), 2.43 (s, 3H), 1.86 (d,  $J$  = 12.9 Hz, 1H), 1.75 (d,  $J$  = 12.2 Hz, 1H), 1.51 (s, 9H);  $^{13}C$  NMR

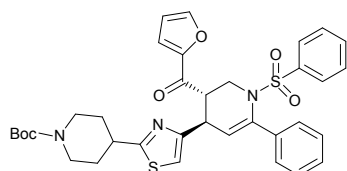
(100 MHz, CDCl<sub>3</sub>) δ 199.71, 174.02, 155.49, 154.68, 144.43, 139.44, 139.13, 138.37, 133.96, 132.93, 129.26, 129.07, 128.66, 128.26, 127.93, 127.83, 127.37, 120.64, 112.39, 79.64, 49.68, 44.42, 40.38, 40.17, 31.96, 31.82, 28.50, 21.61; IR (cm<sup>-1</sup>): 3060, 2976, 2930, 2856, 1687, 1602, 1581, 1512, 1478, 1412, 1365, 1290, 1265, 1169, 1130, 1069, 1130, 1067, 1015, 976, 945, 854, 813, 757, 731, 692,632; HRMS (ESI-TOF) m / z calcd for C<sub>38</sub>H<sub>42</sub>N<sub>3</sub>O<sub>5</sub>S<sub>2</sub> [M + H<sup>+</sup>] 684.2566, found 684.2567.

**tert-Butyl 4-(4-((3S,4S)-6-phenyl-1-(phenylsulfonyl)-3-(thiophene-2-carbonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5bd).**



Isolated yield 80 mg (64%). Pale yellow solid mp 30-31°C; R<sub>f</sub> =0.50 (2:1 PE: EA). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.70 (d, J = 7.6 Hz, 3H), 7.60 (t, J = 7.3 Hz, 1H), 7.48 (dd, J = 14.9, 6.6 Hz, 3H), 7.40 (d, J = 7.2 Hz, 2H), 7.31 (d, J = 6.1 Hz, 3H), 7.10 (t, J = 3.9 Hz, 1H), 6.76 (s, 1H), 5.77 (d, J = 2.1 Hz, 1H), 4.48 (d, J = 13.6 Hz, 1H), 4.36 (d, J = 10.7 Hz, 1H), 4.07 (s, 2H), 3.76 (t, J = 10.7 Hz, 1H), 3.56 (t, J = 12.7 Hz, 1H), 2.95 (t, J = 11.2 Hz, 1H), 2.89 – 2.75 (m, 2H), 1.88 (d, J = 12.5 Hz, 1H), 1.81 (d, J = 13.2 Hz, 1H), 1.50 (s, 9H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 192.50, 174.09, 155.35, 154.66, 144.10, 139.56, 139.20, 138.13, 134.85, 132.96, 132.87, 129.02, 128.32, 128.23, 127.94, 127.79, 127.38, 120.24, 112.41, 79.62, 49.79, 46.76, 40.17, 31.92, 28.50; IR (cm<sup>-1</sup>): 2974, 2929, 2856, 1687, 1517,1446, 1416, 1364, 1237, 1167, 1014, 859,731; HRMS (ESI-TOF) m / z calcd for C<sub>35</sub>H<sub>37</sub>N<sub>3</sub>NaO<sub>5</sub>S<sub>3</sub> [M + Na<sup>+</sup>] 698.1793, found 698.1789.

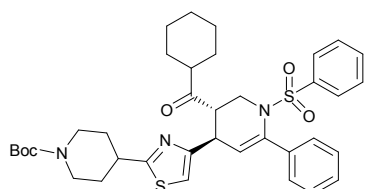
**tert-Butyl 4-(4-((3S,4R)-3-(furan-2-carbonyl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5be).**



Isolated yield 90 mg (74%). Pale yellow solid mp 32-33°C; R<sub>f</sub> =0.44 (2:1 PE: EA). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.72 (d, J = 7.6 Hz, 2H), 7.62 (s, 1H), 7.56 (d, J = 7.4 Hz, 1H), 7.48 – 7.41 (m, 4H), 7.34 – 7.30 (m, 3H), 7.11 (d, J = 3.5 Hz, 1H), 6.69 (s, 1H), 6.55 (d, J

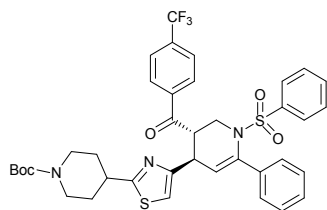
= 1.9 Hz, 1H), 5.77 (d,  $J = 3.3$  Hz, 1H), 4.48 (dd,  $J = 13.1, 2.3$  Hz, 1H), 4.36 (dd,  $J = 9.8, 3.1$  Hz, 1H), 4.07 (s, 2H), 3.64 – 3.48 (m, 2H), 3.01 – 2.79 (m, 3H), 1.87 (dd,  $J = 27.7, 10.3$  Hz, 3H), 1.50 (s, 9H);  $^{13}\text{C}$  NMR (100MHz,  $\text{CDCl}_3$ )  $\delta$  187.85, 173.99, 155.33, 154.67, 152.27, 147.10, 139.33, 139.22, 138.20, 132.91, 128.92, 128.33, 127.93, 127.85, 127.39, 120.33, 118.69, 112.52, 112.23, 79.63, 49.53, 45.50, 40.12, 39.38, 31.97, 28.49; IR ( $\text{cm}^{-1}$ ): 2973, 2929, 2857, 1683, 1566, 1516, 1465, 1425, 1363, 1270, 1236, 1168, 1013, 766, 729, 691, 585; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{35}\text{H}_{38}\text{N}_3\text{O}_6\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 660.2202, found 660.2196.

**tert-Butyl 4-(4-((3S,4R)-3-(cyclohexanecarbonyl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5bf).**



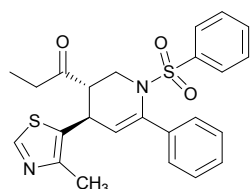
Isolated yield 95 mg (76%). Pale yellow oil;  $R_f = 0.35$  (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.65 (d,  $J = 7.8$  Hz, 2H), 7.50 (t,  $J = 7.3$  Hz, 1H), 7.42 – 7.33 (m, 4H), 7.26 – 7.21 (m, 3H), 6.63 (s, 1H), 5.55 (d,  $J = 2.5$  Hz, 1H), 4.24 (dd,  $J = 13.6, 2.5$  Hz, 1H), 4.15 (s, 2H), 4.01 (dd,  $J = 10.1, 2.6$  Hz, 1H), 3.26 (t,  $J = 12.8$  Hz, 1H), 2.97 (t,  $J = 11.5$  Hz, 1H), 2.81 (t,  $J = 9.5$  Hz, 3H), 2.11 (t,  $J = 8.4$  Hz, 1H), 1.91 (t,  $J = 11.2$  Hz, 2H), 1.71 (d,  $J = 6.8$  Hz, 2H), 1.60 (dd,  $J = 17.0, 5.9$  Hz, 4H), 1.44 (s, 9H), 1.20 – 1.13 (m, 2H), 1.06 (t,  $J = 9.5$  Hz, 2H), 0.93 – 0.79 (m, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  212.96, 174.10, 155.66, 154.67, 139.13, 138.33, 132.93, 129.00, 128.25, 127.87, 127.83, 127.39, 120.62, 112.72, 79.74, 51.46, 49.31, 47.48, 40.56, 39.98, 32.30, 28.49, 27.62, 27.51, 25.72, 25.57, 25.52; IR ( $\text{cm}^{-1}$ ): 3059, 2974, 2930, 2854, 1692, 1514, 1447, 1424, 1364, 1289, 1235, 1169, 1071, 998, 976, 853, 760, 730, 692, 630; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{37}\text{H}_{46}\text{N}_3\text{O}_5\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 676.2879, found 676.2880.

**tert-Butyl 4-(4-((3S,4R)-6-phenyl-1-(phenylsulfonyl)-3-(4-tert-butyl 4-(4-((3S,4R)-6-phenyl-1-(phenylsulfonyl)-3-(4-(trifluoromethyl)benzoyl)-1,2,3,4-tetrahydropyridin-4-yl)thiazol-2-yl)piperidine-1-carboxylate (5bg).**



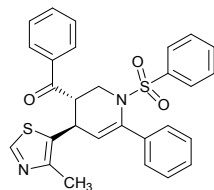
Isolated yield 99 mg (72%). Pale yellow oil;  $R_f$  = 0.44 (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.85 (d,  $J$  = 8.1 Hz, 2H), 7.61 (dd,  $J$  = 17.6, 7.9 Hz, 4H), 7.54 (d,  $J$  = 7.4 Hz, 1H), 7.38 (t,  $J$  = 7.7 Hz, 2H), 7.32 (d,  $J$  = 7.7 Hz, 2H), 7.23 (d,  $J$  = 7.3 Hz, 3H), 6.75 (s, 1H), 5.71 (d,  $J$  = 3.3 Hz, 1H), 4.33 (td,  $J$  = 14.0, 3.1 Hz, 2H), 4.07 – 3.85 (m, 3H), 3.47 (dd,  $J$  = 13.7, 11.6 Hz, 1H), 2.74 (dt,  $J$  = 22.2, 9.4 Hz, 4H), 1.75 – 1.55 (m, 3H), 1.42 (s, 9H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  199.40, 174.35, 155.28, 154.68, 139.62, 139.51, 139.26, 137.96, 133.01, 129.01, 128.86, 128.39, 127.96, 127.72, 127.43, 125.60, 119.80, 114.76, 112.52, 79.70, 49.41, 45.59, 40.48, 32.07, 28.42; IR ( $\text{cm}^{-1}$ ): 3105, 3060, 2976, 2931, 2855, 1687, 1512, 1365, 1324, 1234, 1169, 1130, 1067, 1015, 854. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{38}\text{H}_{39}\text{F}_3\text{N}_3\text{O}_5\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 738.2283, found 738.2280.

**1-((3S,4R)-4-(4-Methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)propan-1-one (5da).**



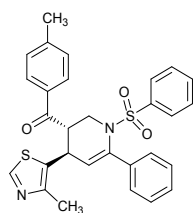
Isolated yield 92 mg (89%). Pale yellow oil;  $R_f$  = 0.22 (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.58 (s, 1H), 7.72 (d,  $J$  = 7.5 Hz, 2H), 7.66 (t,  $J$  = 7.4 Hz, 1H), 7.56 (t,  $J$  = 7.6 Hz, 2H), 7.38 – 7.33 (m, 2H), 7.30 (t,  $J$  = 6.3 Hz, 3H), 5.41 (d,  $J$  = 3.0 Hz, 1H), 4.42 (dd,  $J$  = 14.2, 2.9 Hz, 1H), 4.26 (dd,  $J$  = 10.5, 3.0 Hz, 1H), 3.39 (dd,  $J$  = 14.1, 11.6 Hz, 1H), 2.59 (td,  $J$  = 11.2, 2.9 Hz, 1H), 2.50-2.40 (m, 1H), 2.32 (s, 3H), 2.08-1.94 (m, 1H), 0.90 (t,  $J$  = 7.2 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  267.83, 209.82, 150.59, 149.92, 138.95, 138.86, 137.66, 133.36, 132.11, 129.44, 128.50, 127.89, 127.72, 127.61, 121.02, 50.80, 49.30, 37.14, 35.46, 29.69; IR ( $\text{cm}^{-1}$ ): 3060, 2926, 2854, 2379, 2312, 1712, 1544, 1492, 1447, 1416, 1218, 1171, 1104, 974, 853, 839, 816, 763, 729, 691; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{24}\text{H}_{25}\text{N}_2\text{O}_3\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 453.1307, found 453.1304.

**((3S,4R)-4-(4-Methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)(phenyl)methanone (5db).**



Isolated yield 110 mg (82%). Pale yellow oil;  $R_f = 0.34$  (2:1 PE: EA).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.54 (s, 1H), 7.74 – 7.65 (m, 5H), 7.60-7.51 (m, 4H), 7.43 (t,  $J = 7.7$  Hz, 2H), 7.37 (d,  $J = 7.6$  Hz, 2H), 7.31 (d,  $J = 13.5$  Hz, 3H), 5.57 (d,  $J = 3.1$  Hz, 1H), 4.58 (dd,  $J = 10.2, 2.9$  Hz, 1H), 4.48 (dd,  $J = 14.0, 2.8$  Hz, 1H), 3.76 (td,  $J = 11.2, 2.7$  Hz, 1H), 3.52 (dd,  $J = 13.9, 11.6$  Hz, 1H), 2.28 (s, 3H);  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  199.23, 150.52, 149.98, 139.35, 138.89, 137.63, 135.72, 134.05, 133.28, 132.14, 129.37, 128.82, 128.51, 128.42, 127.96, 127.80, 127.58, 126.33, 121.30, 50.09, 47.03, 35.76, 15.10; IR ( $\text{cm}^{-1}$ ): 3060, 2926, 1721, 1674, 1580, 1538, 1492, 1447, 1417, 1360, 1264, 1227, 1200, 1169, 1090, 981, 854, 813, 763; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{28}\text{H}_{25}\text{N}_2\text{O}_3\text{S}_2$   $[\text{M} + \text{H}^+]$  501.1307, found 501.1308.

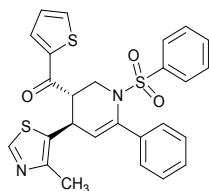
**((3S,4R)-4-(4-Methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)(p-tolyl)methanone (5dc).**



Isolated yield 125 mg (90%). Pale yellow solid mp 53-55°C;  $R_f = 0.34$  (2:1 PE: EA).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.52 (s, 1H), 7.72 – 7.69 (m, 2H), 7.65 (d,  $J = 7.5$  Hz, 1H), 7.60 (d,  $J = 8.2$  Hz, 2H), 7.54 (d,  $J = 7.8$  Hz, 2H), 7.38 (dd,  $J = 7.4, 2.0$  Hz, 2H), 7.29 (d,  $J = 7.3$  Hz, 3H), 7.21 (d,  $J = 8.1$  Hz, 2H), 5.56 (d,  $J = 3.2$  Hz, 1H), 4.55 (dd,  $J = 10.2, 3.1$  Hz, 1H), 4.46 (dd,  $J = 14.0, 3.0$  Hz, 1H), 3.70 (td,  $J = 11.2, 2.8$  Hz, 1H), 3.55 – 3.48 (m, 1H), 2.39 (s, 3H), 2.26 (s, 3H);  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  198.72, 150.38, 149.97, 145.08, 139.40, 138.89, 137.72, 133.30, 133.23, 132.18, 129.49, 129.37, 128.54, 128.46, 127.93, 127.80, 127.58, 121.38, 50.51, 50.15, 46.70, 35.84, 21.71, 15.09; IR ( $\text{cm}^{-1}$ ):

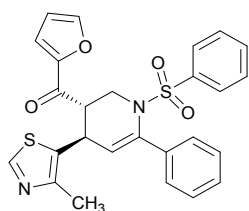
3058, 2924, 2868, 1671, 1606, 1539, 1492, 1446, 1416, 1264, 1230, 1171, 1090, 964, 931, 816; 730, 692, 613; HRMS (ESI-TOF)  $m/z$  calcd for  $C_{29}H_{27}N_2O_3S_2$  [ $M + H^+$ ] 515.1463, found 515.1462.

**((3S,4R)-4-(4-Methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)(thiophen-2-yl)methanone (5dd).**



Isolated yield 130 mg (96%). Pale yellow solid mp 29-30°C ;  $R_f$  = 0.24 (2:1 PE: EA).  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  8.54 (s, 1H), 7.70 – 7.67 (m, 3H), 7.63 (d,  $J$  = 7.4 Hz, 1H), 7.51 (t,  $J$  = 7.7 Hz, 2H), 7.46 (d,  $J$  = 3.8 Hz, 1H), 7.33 (d,  $J$  = 7.9 Hz, 2H), 7.30 – 7.26 (m, 3H), 7.08 (t,  $J$  = 4.4 Hz, 1H), 5.55 (d,  $J$  = 3.2 Hz, 1H), 4.57 – 4.48 (m, 2H), 3.64 – 3.54 (m, 2H), 2.28 (s, 3H);  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  191.59, 150.49, 150.23, 143.42, 139.50, 138.99, 137.46, 135.66, 133.24, 132.00, 129.30, 128.53, 127.95, 127.79, 127.59, 121.04, 50.27, 48.87, 35.74, 15.09; IR ( $cm^{-1}$ ): 3083, 3059, 2958, 2925, 2854, 1653, 1516, 1414, 1355, 1263, 1238, 1169. HRMS (ESI-TOF)  $m/z$  calcd for  $C_{26}H_{23}N_2O_3S_3$  [ $M + H^+$ ] 507.0871, found 507.0868.

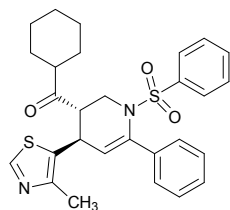
**Furan-2-yl-((3S,4R)-4-(4-methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)methanone (5de).**



Isolated yield 120 mg (92%). Pale yellow oil ;  $R_f$  = 0.37 (2:1 PE: EA).  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  8.53 (s, 1H), 7.73 (d,  $J$  = 7.4 Hz, 2H), 7.64 (dd,  $J$  = 15.6, 8.2 Hz, 2H), 7.54 (t,  $J$  = 7.7 Hz, 2H), 7.39 – 7.34 (m, 2H), 7.30 (t,  $J$  = 6.8 Hz, 3H), 7.08 (d,  $J$  = 3.6 Hz, 1H), 6.52 (dd,  $J$  = 3.6, 1.6 Hz, 1H), 5.52 (d,  $J$  = 3.2 Hz, 1H), 4.58 – 4.50 (m, 2H), 3.59 – 3.41 (m, 2H), 2.30 (s, 3H);  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  186.75, 151.74, 150.51, 150.11, 147.75, 139.20, 138.87, 137.58, 133.29, 132.00, 129.31, 128.54, 127.92, 127.85, 127.62,

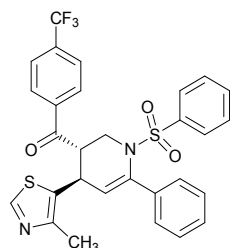
121.20, 119.43, 112.79, 50.01, 47.72, 35.05, 15.05; IR (cm<sup>-1</sup>): 3059, 2926, 2856, 1667, 1584, 1540, 1492, 1463, 1417, 1360, 1268, 1241, 1211, 1170, 1113, 1089, 1026, 982, 932, 854, 830, 766, 730, 690; HRMS (ESI-TOF) *m/z* calcd for C<sub>26</sub>H<sub>23</sub>N<sub>2</sub>O<sub>4</sub>S<sub>2</sub> [M + H<sup>+</sup>] 491.1099, found 491.1095.

**Cyclohexyl-((3S,4R)-4-(4-methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)methanone (5df).**



Isolated yield 130 mg (97%). Pale yellow oil; *R<sub>f</sub>* = 0.45 (2:1 PE: EA). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 8.57 (s, 1H), 7.73 (d, *J* = 8.5 Hz, 2H), 7.66 (t, *J* = 7.3 Hz, 1H), 7.56 (t, *J* = 7.6 Hz, 2H), 7.36 (d, *J* = 4.6 Hz, 2H), 7.29 (d, *J* = 6.0 Hz, 3H), 5.45 (d, *J* = 3.1 Hz, 1H), 4.35 (ddd, *J* = 13.3, 12.3, 2.9 Hz, 2H), 3.33 (dd, *J* = 14.1, 11.5 Hz, 1H), 2.72 (td, *J* = 11.2, 2.9 Hz, 1H), 2.13 (t, *J* = 11.1 Hz, 1H), 1.82 – 1.59 (m, 5H), 1.24 – 1.06 (m, 5H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 211.93, 150.46, 149.91, 139.06, 138.80, 137.75, 133.31, 132.12, 129.39, 128.47, 127.88, 127.77, 127.61, 121.27, 51.19, 49.61, 49.44, 35.42, 27.39, 27.17, 25.57, 25.17, 15.02; IR (cm<sup>-1</sup>): 3058, 2930, 2854, 1704, 1632, 1584, 1539, 1492, 1447, 1362, 1265, 1171, 1090, 971, 918, 853, 818, 761, 729, 625; HRMS (ESI-TOF) *m/z* calcd for C<sub>28</sub>H<sub>31</sub>N<sub>2</sub>O<sub>3</sub>S<sub>2</sub> [M + H<sup>+</sup>] 507.1776, found 507.1775.

**((3S,4R)-4-(4-Methylthiazol-5-yl)-6-phenyl-1-(phenylsulfonyl)-1,2,3,4-tetrahydropyridin-3-yl)-(4-(trifluoromethyl)phenyl)methanone (5dg).**

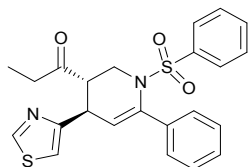


Isolated yield 68 mg (45%). Pale yellow solid mp 36-37°C; *R<sub>f</sub>* = 0.47 (2:1 PE: EA). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 8.50 (s, 1H), 7.85 (d, *J* = 8.2 Hz, 2H), 7.65 (d, *J* = 8.2 Hz, 2H), 7.58 (t, *J* = 7.1 Hz, 3H), 7.43 (t, *J* = 7.9 Hz, 2H), 7.26 – 7.18 (m, 5H), 5.51 (d, *J* = 3.2 Hz,



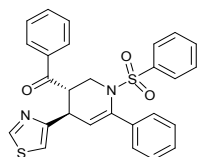
1H), 4.54 (dd,  $J = 10.3, 3.0$  Hz, 1H), 4.43 (dd,  $J = 14.0, 2.9$  Hz, 1H), 3.81 (td,  $J = 11.0, 2.8$  Hz, 1H), 3.44 (dd,  $J = 13.9, 11.4$  Hz, 1H), 2.26 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  198.36, 150.62, 150.07, 139.55, 139.06, 138.29, 137.25, 133.27, 131.88, 129.25, 128.79, 128.57, 127.97, 127.74, 127.63, 125.93, 125.90, 120.83, 49.99, 48.04, 35.68, 15.13. IR ( $\text{cm}^{-1}$ ): 3061, 2926, 1682, 1635, 1581, 1539, 1511, 1492, 1447, 1412, 1363, 1324, 1264, 1226, 1170, 1131, 1067, 1014, 965, 931, 7598, 731; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{29}\text{H}_{24}\text{F}_3\text{N}_2\text{O}_3\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 569.1180, found 569.1178.

**1-((3S,4R)-6-Phenyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)propan-1-one (5ea).**



Isolated yield 85 mg (90%). Pale yellow oil ; $R_f$  =0.39 (3:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.61 (d,  $J = 1.8$  Hz, 1H), 7.62 (d,  $J = 7.5$  Hz, 2H), 7.48 (t,  $J = 7.4$  Hz, 1H), 7.37 (dd,  $J = 18.6, 11.0$  Hz, 4H), 7.23 (d,  $J = 7.0$  Hz, 3H), 6.81 (d,  $J = 1.3$  Hz, 1H), 5.61 (d,  $J = 3.5$  Hz, 1H), 4.30 (dd,  $J = 13.9, 3.3$  Hz, 1H), 4.18 (dd,  $J = 10.0, 3.4$  Hz, 1H), 3.33 (dd,  $J = 13.8, 11.7$  Hz, 1H), 2.77 (td,  $J = 11.5, 3.3$  Hz, 1H), 2.43 (dt,  $J = 21.6, 7.2$  Hz, 1H), 2.24 – 2.10 (m, 1H), 0.93 (t,  $J = 7.2$  Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  210.52, 157.24, 152.77, 139.43, 139.07, 138.07, 132.99, 129.00, 127.91, 127.74, 127.42, 120.22, 113.48, 49.22, 48.98, 39.03, 36.71, 7.40; IR ( $\text{cm}^{-1}$ ): 2977, 2937, 1713, 1640, 1599, 1583, 1493, 1447, 1408, 1355, 1265, 1221, 1168, 1105, 1026, 969, 874, 837, 764, 729, 691, 633; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{23}\text{H}_{22}\text{N}_2\text{NaO}_3\text{S}_2$  [ $\text{M} + \text{Na}^+$ ] 461.0970, found 461.0968.

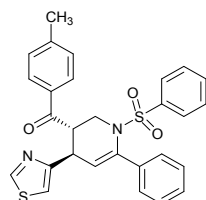
**Phenyl-((3S,4R)-6-phenyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)methanone (5eb).**



Isolated yield 90 mg (66%). Pale yellow solid mp 118-120°C;  $R_f$  =0.38 (3:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.62 (d,  $J = 1.9$  Hz, 1H), 7.81 (d,  $J = 7.3$  Hz, 2H), 7.68 (d,  $J =$

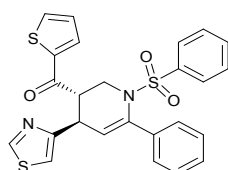
8.6 Hz, 2H), 7.58 (d,  $J = 14.9$  Hz, 2H), 7.44 (td,  $J = 7.8, 3.1$  Hz, 4H), 7.40 – 7.37 (m, 2H), 7.28 (d,  $J = 7.2$  Hz, 3H), 6.93 (d,  $J = 1.8$  Hz, 1H), 5.79 (d,  $J = 3.5$  Hz, 1H), 4.56 (dd,  $J = 10.1, 3.4$  Hz, 1H), 4.45 (dd,  $J = 13.9, 3.3$  Hz, 1H), 4.05 – 3.97 (m, 1H), 3.46 (dd,  $J = 13.8, 11.6$  Hz, 1H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  199.57, 157.00, 152.80, 139.59, 139.23, 138.05, 136.09, 133.60, 132.93, 128.99, 128.71, 128.60, 128.28, 127.92, 127.85, 127.41, 120.55, 113.86, 49.81, 45.36, 39.41; IR ( $\text{cm}^{-1}$ ): 3057, 2959, 2921 2851, 2379, 2309, 1723, 1678, 1596, 1492, 1447, 1408, 1353, 1286, 1263, 1226, 968, 874, 809, 733, 689; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{27}\text{H}_{23}\text{N}_2\text{O}_3\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 487.1150, found 487.1141.

**((3S,4R)-6-Phenyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)(p-tolyl)methanone (5ec).**



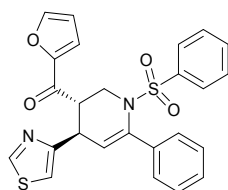
Isolated yield 130 mg (93%). Pale yellow solid mp 35-37°C;  $R_f = 0.45$  (3:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.72 – 7.67 (m, 4H), 7.56 (t,  $J = 7.4$  Hz, 1H), 7.47 – 7.37 (m, 4H), 7.29 – 7.20 (m, 5H), 6.89 (d,  $J = 1.8$  Hz, 1H), 5.78 (d,  $J = 3.5$  Hz, 1H), 4.54 (dd,  $J = 10.1, 3.4$  Hz, 1H), 4.43 (dd,  $J = 13.9, 3.3$  Hz, 1H), 3.95 (td,  $J = 11.4, 3.3$  Hz, 1H), 3.45 (dd,  $J = 13.8, 11.6$  Hz, 1H), 2.40 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  199.05, 157.01, 152.83, 144.63, 139.55, 139.16, 138.15, 133.57, 132.97, 129.44, 129.03, 128.74, 128.27, 127.85, 127.40, 120.73, 113.87, 49.90, 45.05, 39.38, 21.74; IR ( $\text{cm}^{-1}$ ): 3059, 2924, 2871, 1673, 1606, 1572, 1504, 1446, 1409, 1355, 1263, 1230, 1167, 1119, 1090.31, 1029, 969, 940, 857, 810, 730, 695; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{28}\text{H}_{25}\text{N}_2\text{O}_3\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 501.1307, found 501.1305.

**((3S,4R)-6-Phenyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)(thiophen-2-yl)methanone (5ed).**



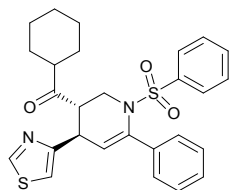
Isolated yield 89 mg (65%). Pale yellow solid mp 38-40°C;  $R_f = 0.52$  (2:1 PE: EA).  $^1\text{H}$  NMR (400 MHz, )  $\delta$  8.69 (d,  $J = 1.8$  Hz), 7.96 (d,  $J = 8.6$  Hz), 7.71 – 7.69 (m), 7.64 (d,  $J = 3.7$  Hz), 7.56 (dd,  $J = 15.9, 6.5$  Hz), 7.47 (t,  $J = 7.7$  Hz), 7.36 (d,  $J = 6.4$  Hz), 7.29 (dd,  $J = 6.0, 3.9$  Hz), 7.15 – 7.10 (m), 6.97 (d,  $J = 1.8$  Hz), 5.77 (d,  $J = 3.4$  Hz), 4.57 – 4.51 (m), 3.92 (td,  $J = 11.3, 3.2$  Hz), 3.53 (dd,  $J = 13.7, 11.7$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  191.94, 156.72, 153.03, 143.66, 139.68, 139.18, 137.84, 135.08, 133.21, 132.98, 129.14, 128.99, 128.46, 128.24, 127.92, 127.79, 127.42, 126.42, 120.38, 114.16, 50.16, 47.18, 39.20; IR ( $\text{cm}^{-1}$ ): 3087, 3063, 2954, 2921, 2850, 1653, 1515, 1446, 1413, 1352. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{25}\text{H}_{21}\text{N}_2\text{O}_3\text{S}_3$  [ $\text{M} + \text{H}^+$ ] 493.0714, found 493.0707.

**Furan-2-yl-((3S,4R)-6-phenyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)methanone (5ee).**



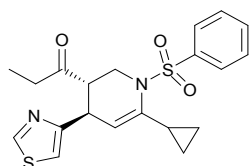
Isolated yield 140 mg (96%). Pale yellow solid mp 40-42°C;  $R_f = 0.45$  (3:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.63 (d,  $J = 1.9$  Hz, 1H), 7.76 – 7.72 (m, 2H), 7.63 (d,  $J = 1.1$  Hz, 1H), 7.58 (t,  $J = 7.4$  Hz, 1H), 7.47 (t,  $J = 7.7$  Hz, 2H), 7.42 (dd,  $J = 7.4, 2.1$  Hz, 2H), 7.30 (dd,  $J = 9.2, 2.9$  Hz, 3H), 7.19 (d,  $J = 3.5$  Hz, 1H), 6.87 (d,  $J = 1.8$  Hz, 1H), 6.55 (dd,  $J = 3.6, 1.7$  Hz, 1H), 5.78 (d,  $J = 3.5$  Hz, 1H), 4.56 – 4.50 (m, 2H), 3.74 – 3.67 (m, 1H), 3.52 (dd,  $J = 13.7, 11.7$  Hz, 1H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  187.29, 156.76, 152.79, 151.97, 147.35, 139.33, 139.22, 138.01, 132.97, 128.95, 128.34, 127.93, 127.90, 127.42, 120.52, 119.18, 113.82, 112.64, 49.77, 45.82, 38.58; IR ( $\text{cm}^{-1}$ ): 3117, 3059, 2926, 2854, 1668, 1566, 1493, 1447, 1397, 1355, 1267, 1243, 1166, 1115, 1080, 1060, 1015, 972, 945, 912, 882, 847, 815, 766, 730, 690, 634, 585; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{25}\text{H}_{21}\text{N}_2\text{O}_4\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 477.0943, found 477.0942.

**Cyclohexyl-((3S,4R)-6-phenyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)methanone (5ef).**



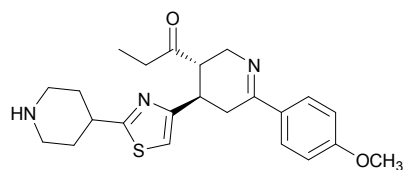
Isolated yield 78 mg (60%). Pale yellow oil;  $R_f$  = 0.58 (3:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.64 (d,  $J$  = 1.9 Hz, 1H), 7.72 (d,  $J$  = 7.4 Hz, 2H), 7.55 (t,  $J$  = 7.4 Hz, 1H), 7.48 – 7.40 (m, 4H), 7.32 – 7.26 (m, 3H), 6.84 (d,  $J$  = 1.7 Hz, 1H), 5.64 (d,  $J$  = 3.3 Hz, 1H), 4.32 (dd,  $J$  = 13.9, 3.2 Hz, 1H), 4.23 (dd,  $J$  = 10.2, 3.3 Hz, 1H), 3.31 (dd,  $J$  = 13.8, 11.8 Hz, 1H), 2.85 (td,  $J$  = 11.6, 3.1 Hz, 1H), 2.18 – 2.10 (m, 1H), 1.77 – 1.60 (m, 5H), 1.25 (dd,  $J$  = 19.3, 10.8 Hz, 3H), 1.16 – 1.10 (m, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  212.69, 157.04, 152.70, 139.32, 139.05, 138.24, 133.02, 129.04, 128.28, 127.93, 127.85, 127.56, 127.40, 120.55, 113.87, 51.22, 49.28, 47.80, 39.31, 27.65, 27.50, 25.62, 25.40; IR ( $\text{cm}^{-1}$ ): 3109, 3063, 2931, 5855, 1703, 1637, 1600, 1493, 1447, 1357, 1266, 1234, 1211, 1168, 1090, 1027, 972, 875, 849, 763, 690, 632, 589; HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{27}\text{H}_{29}\text{N}_2\text{O}_3\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 493.1620, found 493.1618.

**1-((3S,4R)-6-Cyclopropyl-1-(phenylsulfonyl)-4-(thiazol-4-yl)-1,2,3,4-tetrahydropyridin-3-yl)propan-1-one (5ia).**



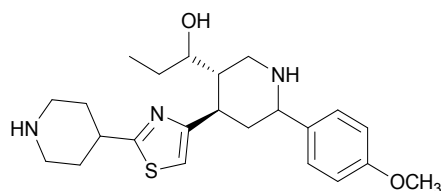
Isolated yield 66 mg (66%). Pale yellow oil;  $R_f$  = 0.35 (3:1 PE: EA).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.94 – 7.89 (m, 2H), 7.55 (ddd,  $J$  = 14.7, 7.9, 6.5 Hz, 3H), 6.80 (dd,  $J$  = 1.9, 0.5 Hz, 1H), 5.22 (dd,  $J$  = 3.3, 1.1 Hz, 1H), 4.21 (dd,  $J$  = 13.6, 3.3 Hz, 1H), 4.06 (dd,  $J$  = 7.0, 2.4 Hz, 1H), 3.30 (dd,  $J$  = 13.6, 10.8 Hz, 1H), 2.85 – 2.76 (m, 1H), 2.49 (dq,  $J$  = 18.2, 7.2 Hz, 1H), 2.23 – 2.16 (m, 1H), 1.98 – 1.87 (m, 1H), 0.97 (t,  $J$  = 7.2 Hz, 4H), 0.78 (dd,  $J$  = 11.3, 3.1 Hz, 1H), 0.57 (dt,  $J$  = 8.5, 2.6 Hz, 2H), 0.43 – 0.38 (m, 1H);  $^{13}\text{C}$  NMR (101 MHz,  $\text{CDCl}_3$ )  $\delta$  210.63, 157.85, 152.83, 140.67, 132.82, 129.09, 127.21, 113.52, 112.52, 49.75, 48.54, 38.46, 36.49, 15.31, 8.72, 7.38, 7.05; IR ( $\text{cm}^{-1}$ ): 3086, 2955, 2923, 2851, 1712, 1652, 1505, 1447, 1349, 1166, 1092, 1025. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{20}\text{H}_{23}\text{N}_2\text{O}_3\text{S}_2$  [ $\text{M} + \text{H}^+$ ] 403.1150, found 403.1152.

**Structures and physical data of 1-((3S,4R)-6-(4-methoxyphenyl)-4-(2-(piperidin-4-yl)thiazol-4-yl)-2,3,4,5-tetrahydropyridin-3-yl)propan-1-one (6).**



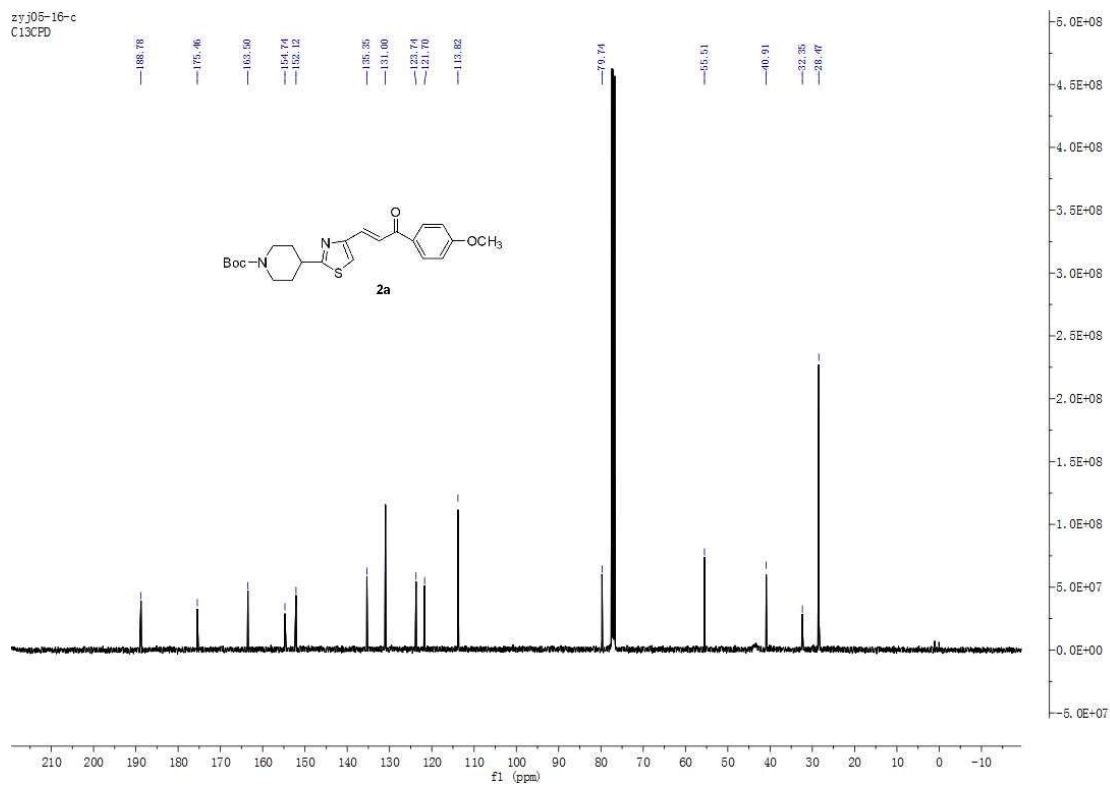
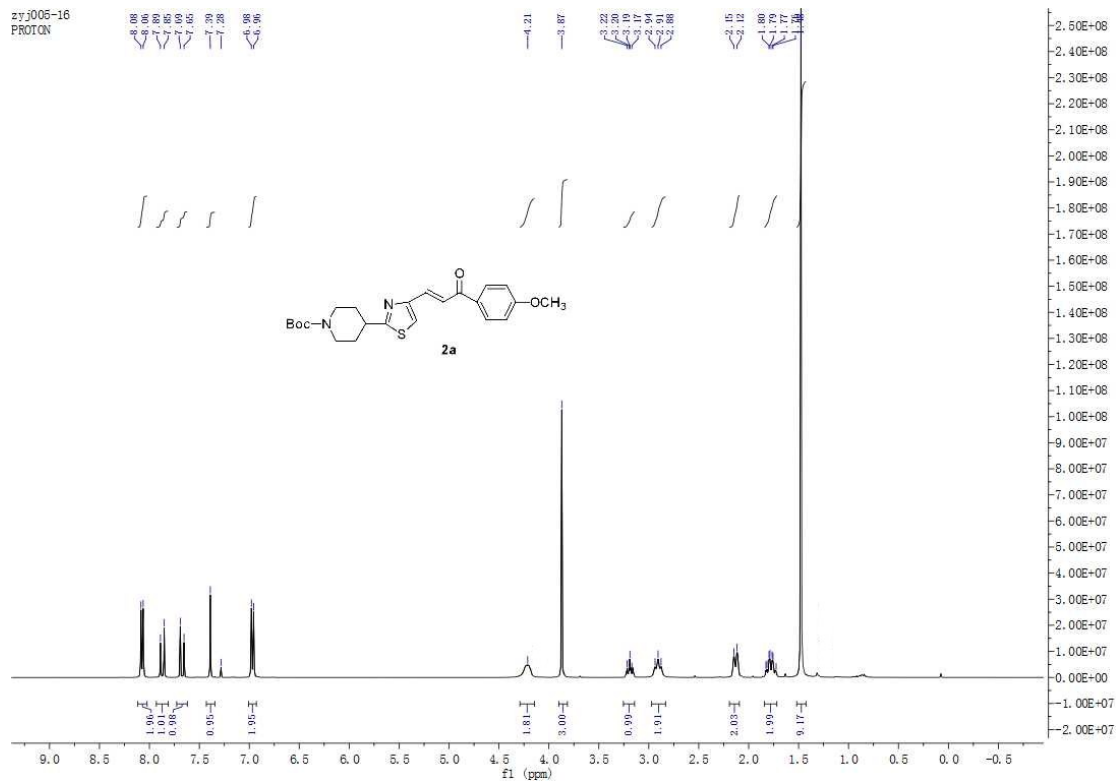
Isolated yield 74 mg (60%). Pale yellow oil;  $R_f = 0.37$  (15:1 DCM: MeOH).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.75 (d,  $J = 8.9$  Hz, 2H), 6.88 (d,  $J = 8.9$  Hz, 2H), 6.83 (s, 1H), 4.14 (dd,  $J = 16.8, 4.0$  Hz, 1H), 3.85 – 3.74 (m, 4H), 3.40 (dd,  $J = 10.5, 6.1$  Hz, 1H), 3.31 – 3.23 (m, 1H), 3.18 (d,  $J = 14.7$  Hz, 2H), 3.12 – 2.93 (m, 3H), 2.75 (td,  $J = 12.1, 2.2$  Hz, 2H), 2.44 – 2.34 (m, 1H), 2.26 (s, 1H), 2.17 (dd,  $J = 16.2, 9.0$  Hz, 1H), 2.06 (dd,  $J = 12.3, 10.9$  Hz, 2H), 1.77 – 1.64 (m, 2H), 0.87 (t,  $J = 7.2$  Hz, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  213.44, 175.93, 163.99, 160.95, 156.65, 131.78, 127.55, 113.45, 113.13, 55.24, 52.20, 50.00, 46.19, 40.97, 37.02, 36.56, 33.73, 33.51, 32.81, 7.32. IR ( $\text{cm}^{-1}$ ): 2934, 2838, 1706, 1639, 1605, 1511, 1460, 1361, 1306, 1251, 1174, 113, 1032, 833, 734. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{23}\text{H}_{30}\text{N}_3\text{O}_2\text{S}$  [ $\text{M} + \text{H}^+$ ] 412.2059, found 412.2056.

**Structures and physical data of (1R)-1-((3S,4R)-6-(4-methoxyphenyl)-4-(2-(piperidin-4-yl)thiazol-4-yl)piperidin-3-yl)piperidin-3-yl)propan-1-ol (7).**

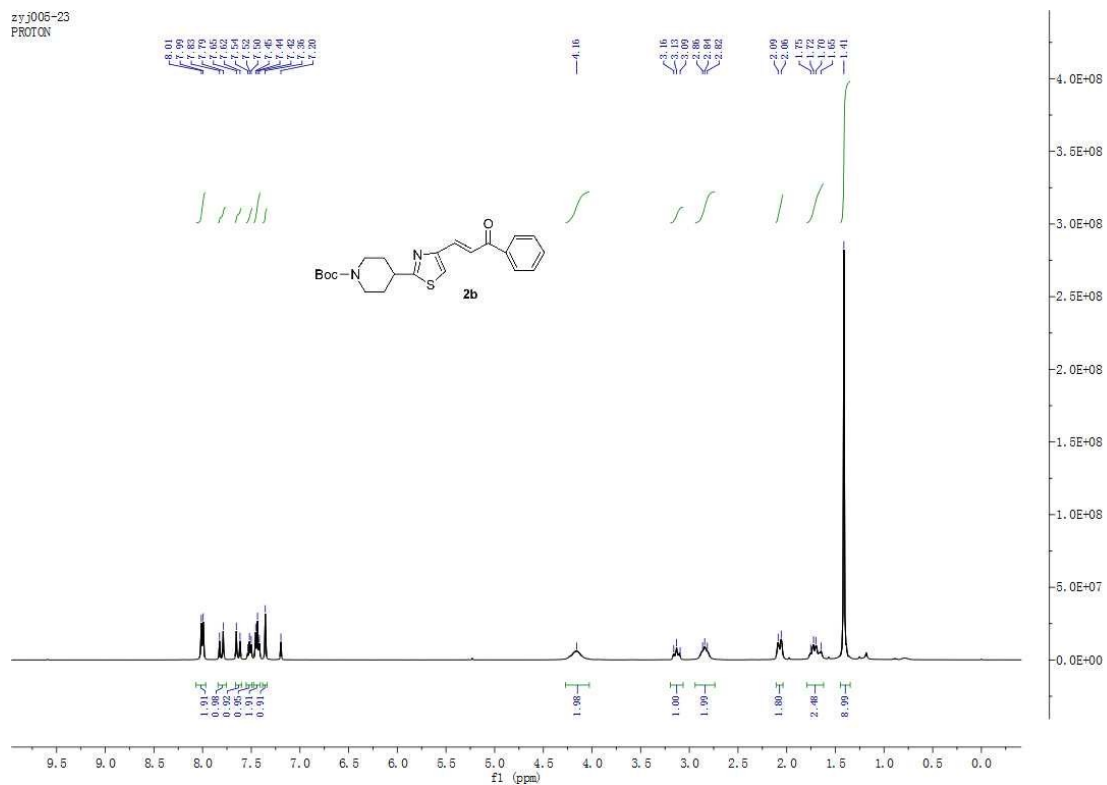


Isolated yield 80 mg (78%). Pale yellow oil;  $R_f = 0.13$  (15:1 DCM: MeOH).  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.37 (d,  $J = 8.4$  Hz, 2H), 6.94 – 6.82 (m, 3H), 3.86 – 3.75 (m, 4H), 3.33–3.25 (m, 5H), 3.15 (t,  $J = 10.8$  Hz, 1H), 2.98 (t,  $J = 11.6$  Hz, 1H), 2.88–2.81 (m, 3H), 2.17–2.07 (m, 4H), 1.97 – 1.84 (m, 6H), 0.88 (t,  $J = 7.2$  Hz, 3H);  $^{13}\text{C NMR}$  (100MHz,  $\text{CDCl}_3$ )  $\delta$  178.09, 173.14, 159.08, 158.78, 128.06, 113.90, 112.17, 71.41, 60.81, 55.28, 46.30, 45.42, 45.14, 44.04, 40.95, 39.43, 38.99, 30.84, 26.69, 24.00, 11.04; IR ( $\text{cm}^{-1}$ ): 3458, 2955, 2926, 2871, 2853, 1612, 1513, 1247, 1179, 1033, 830, 736. HRMS (ESI-TOF)  $m/z$  calcd for  $\text{C}_{23}\text{H}_{34}\text{N}_3\text{O}_2\text{S}$  [ $\text{M} + \text{H}^+$ ] 416.2372, found 416.2357.

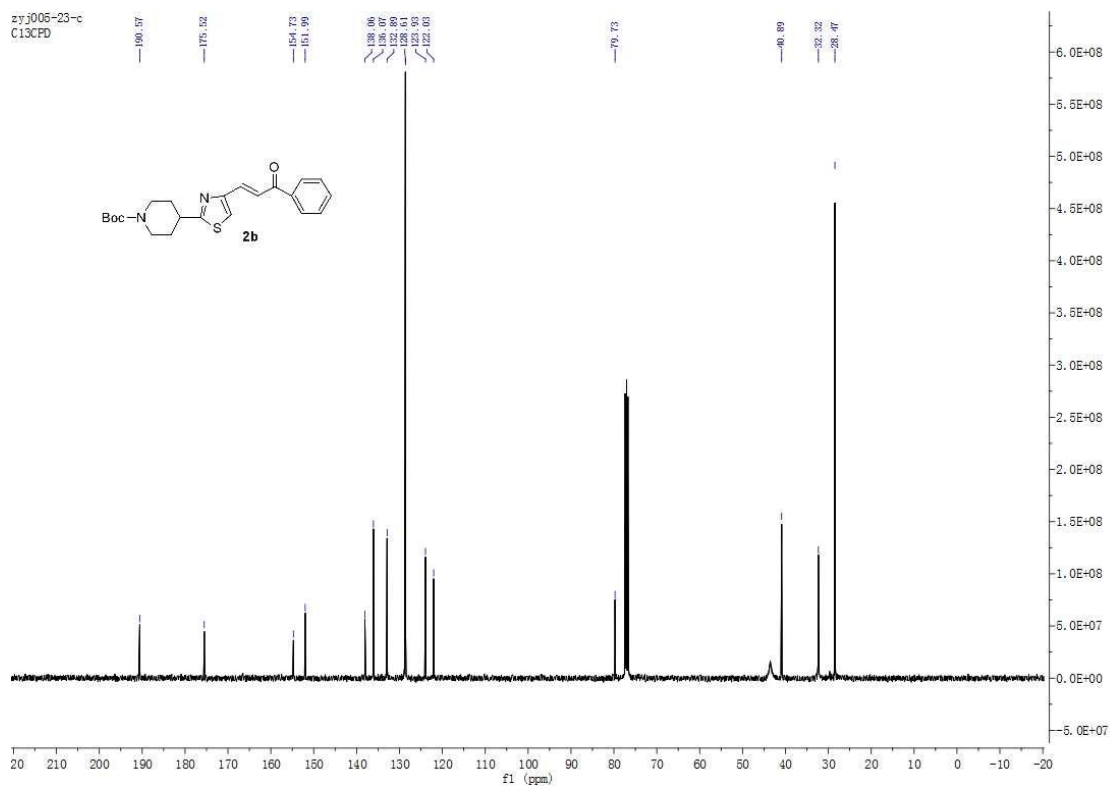
## Copies of <sup>1</sup>H and <sup>13</sup>C NMR Spectra for Compounds 2, 3, 5, 6, 7

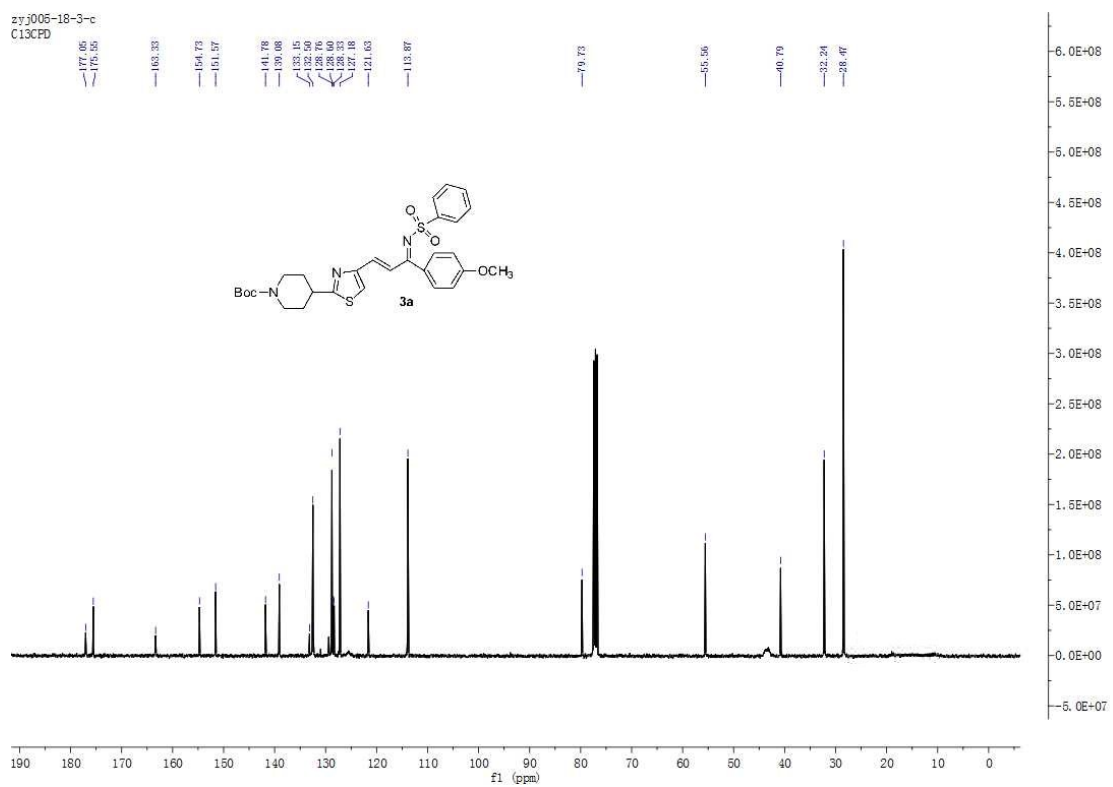
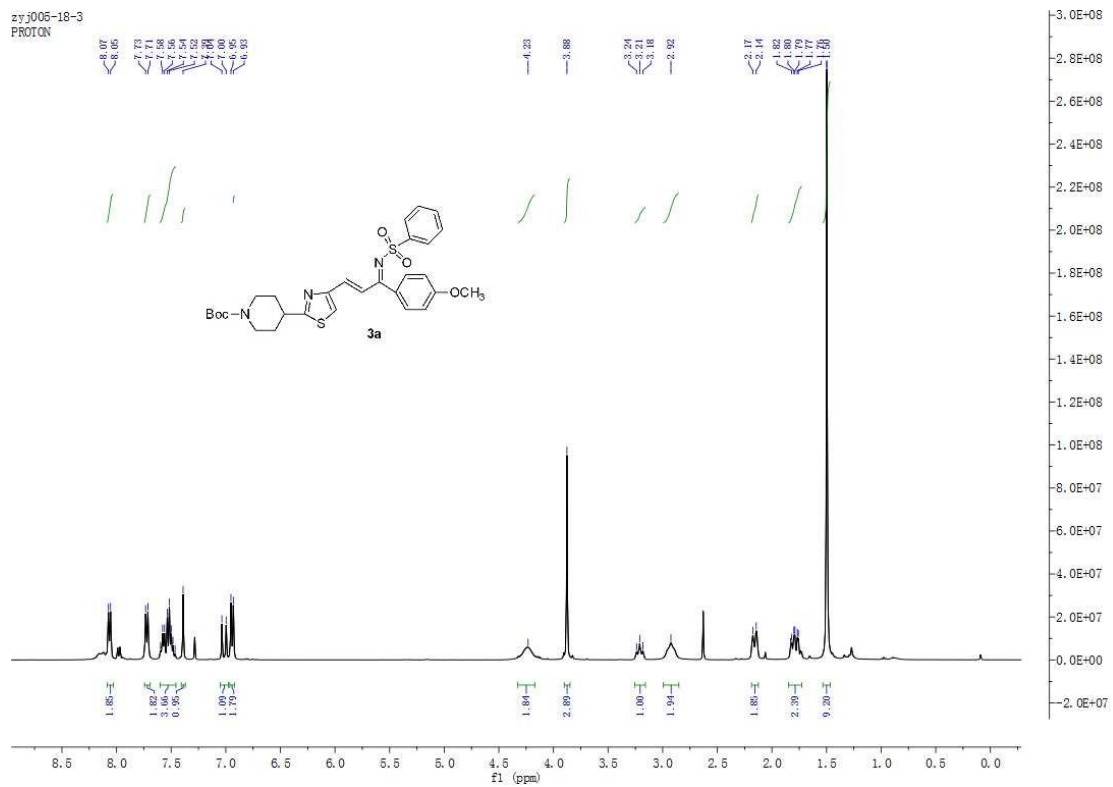


zyj005-23  
PROTON



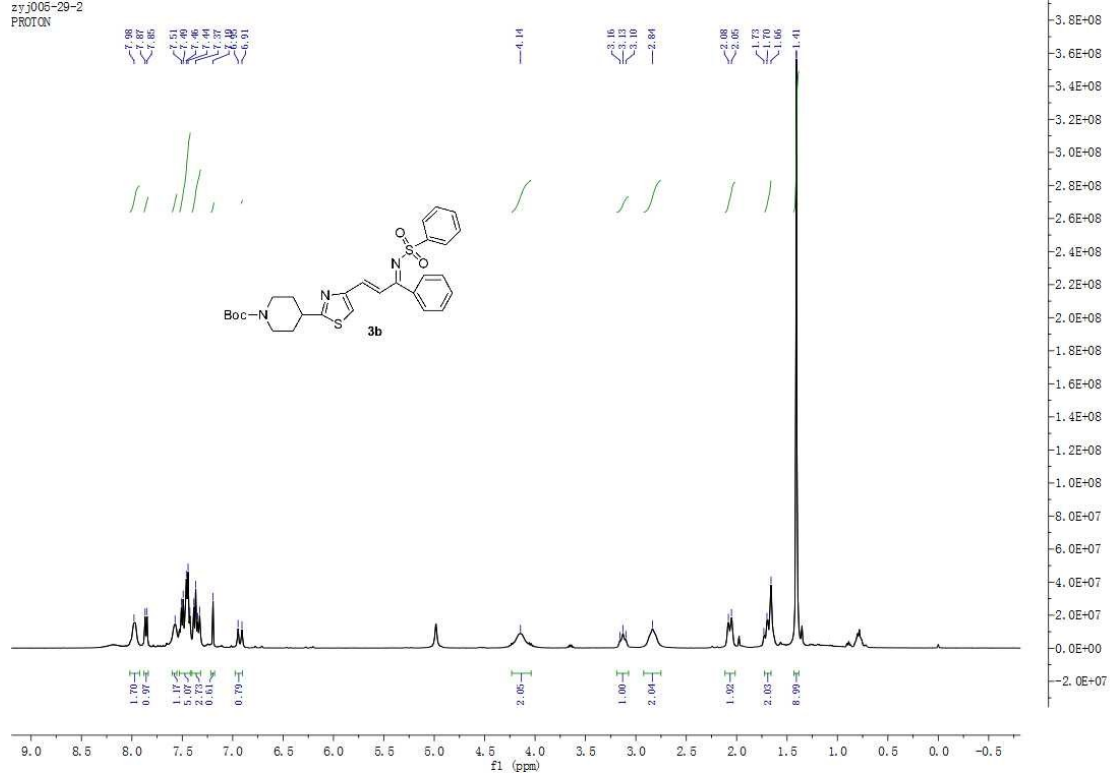
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C13CPD



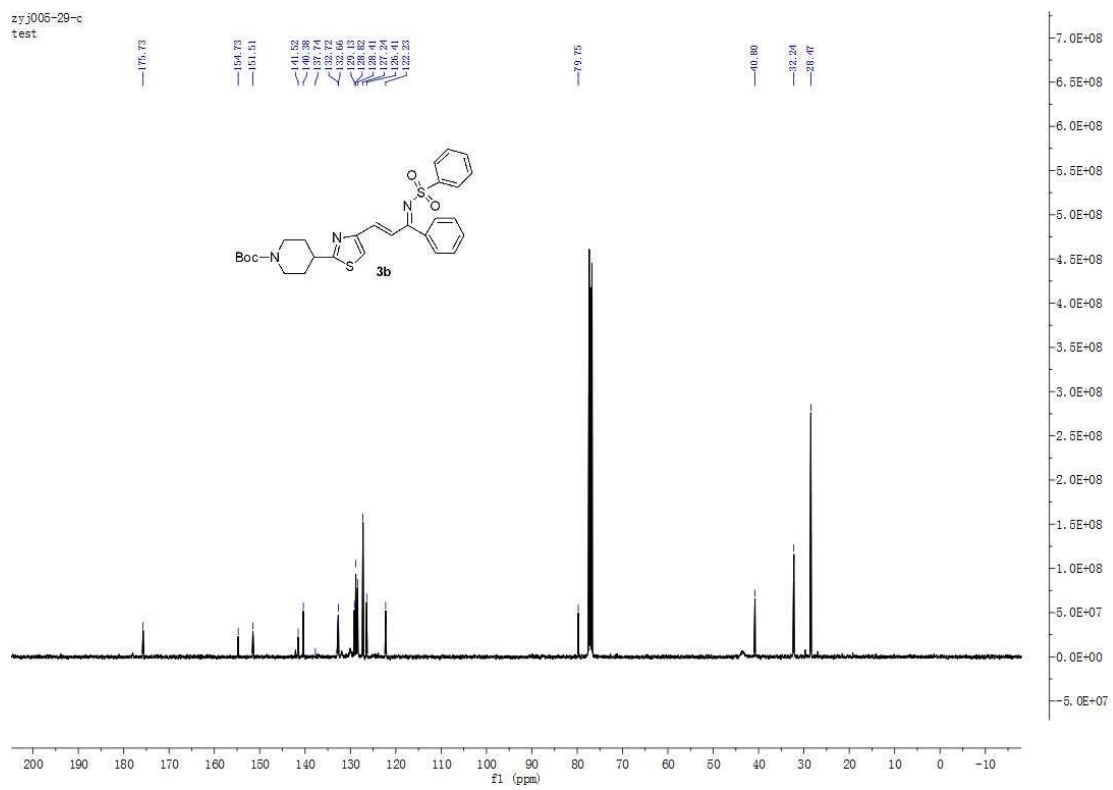




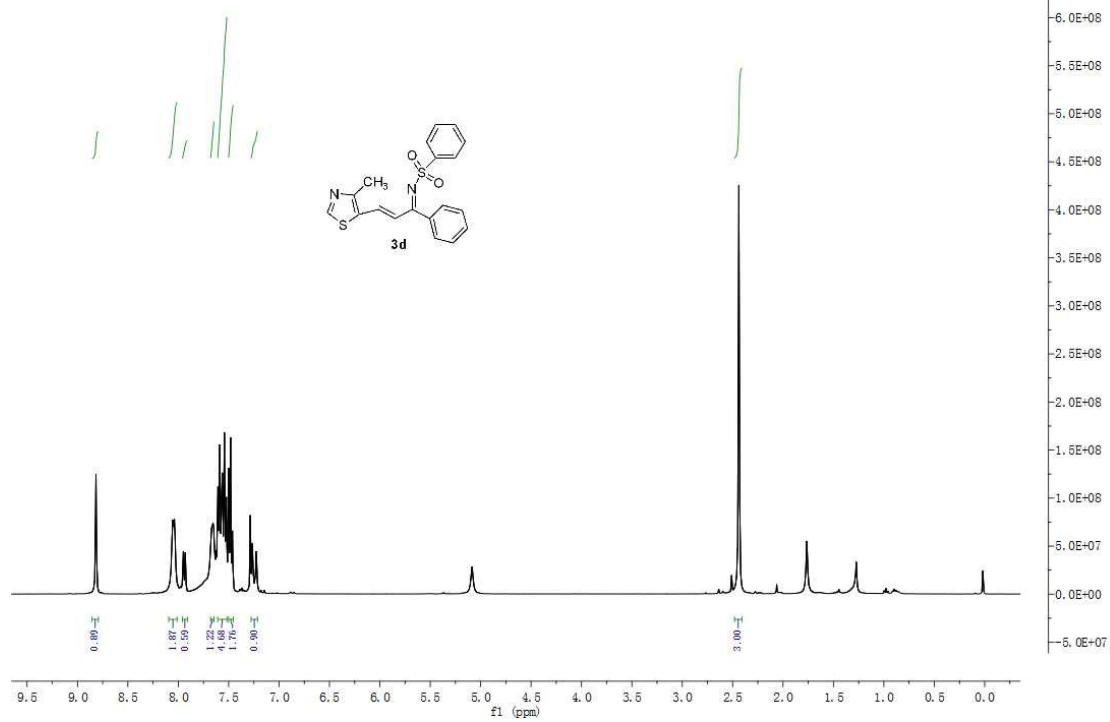
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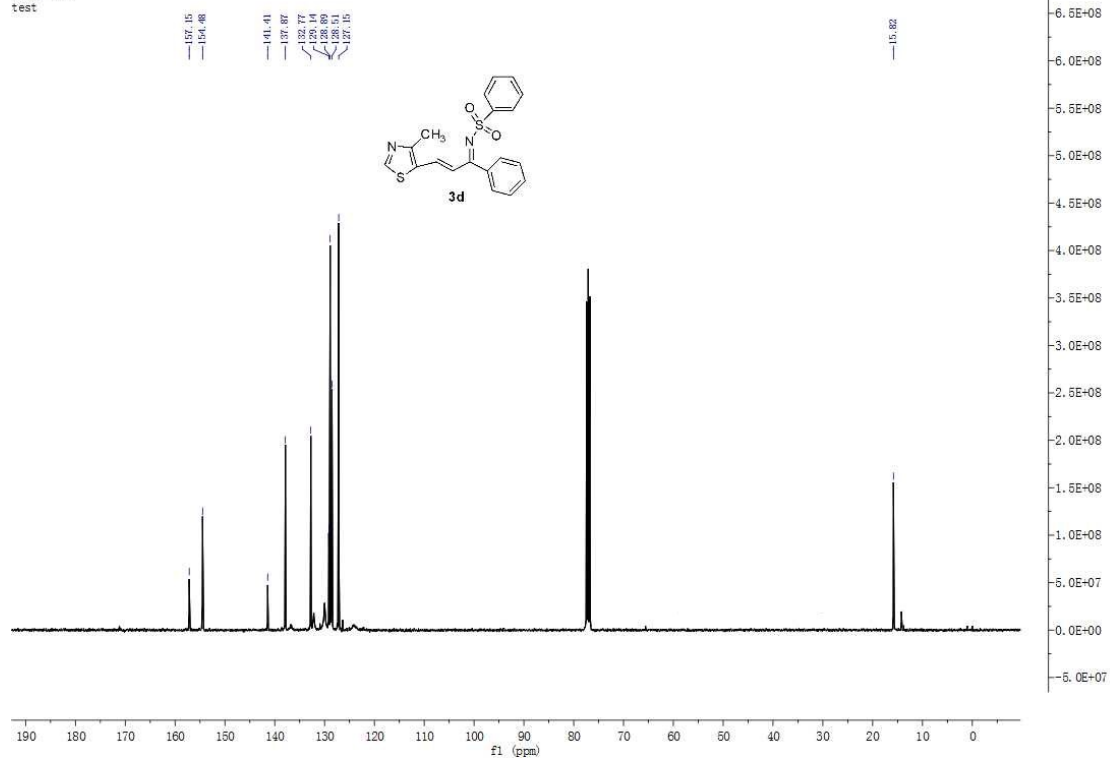
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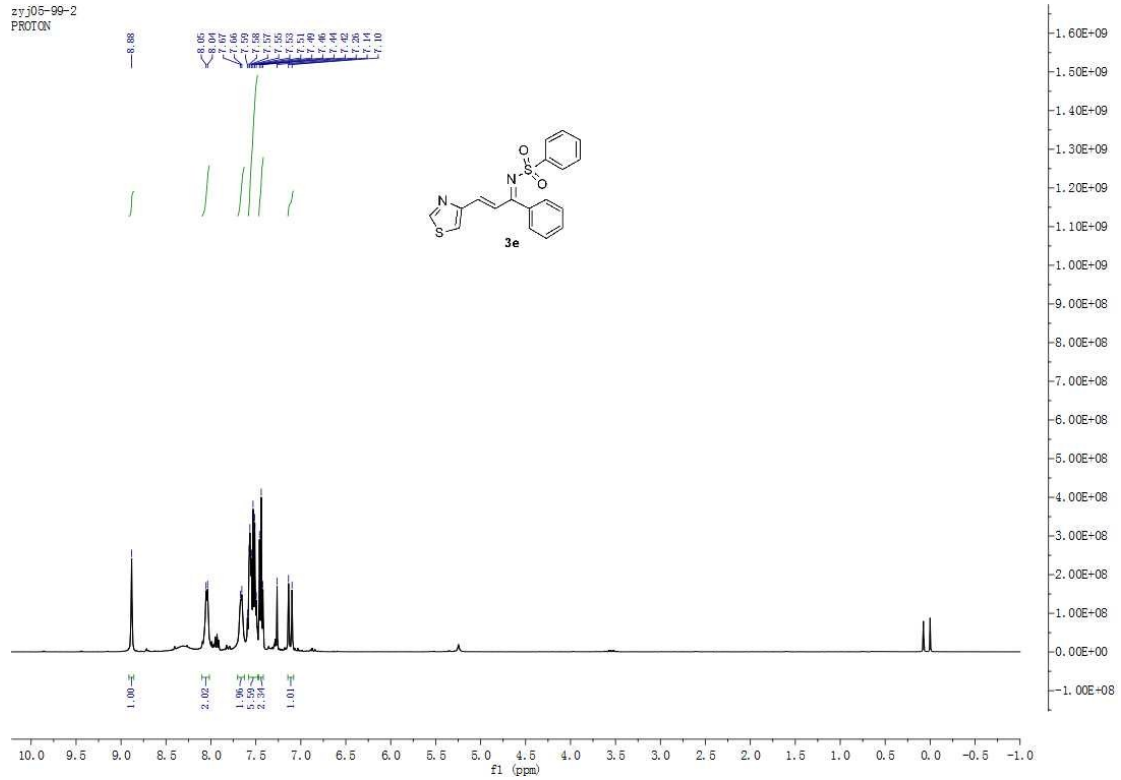
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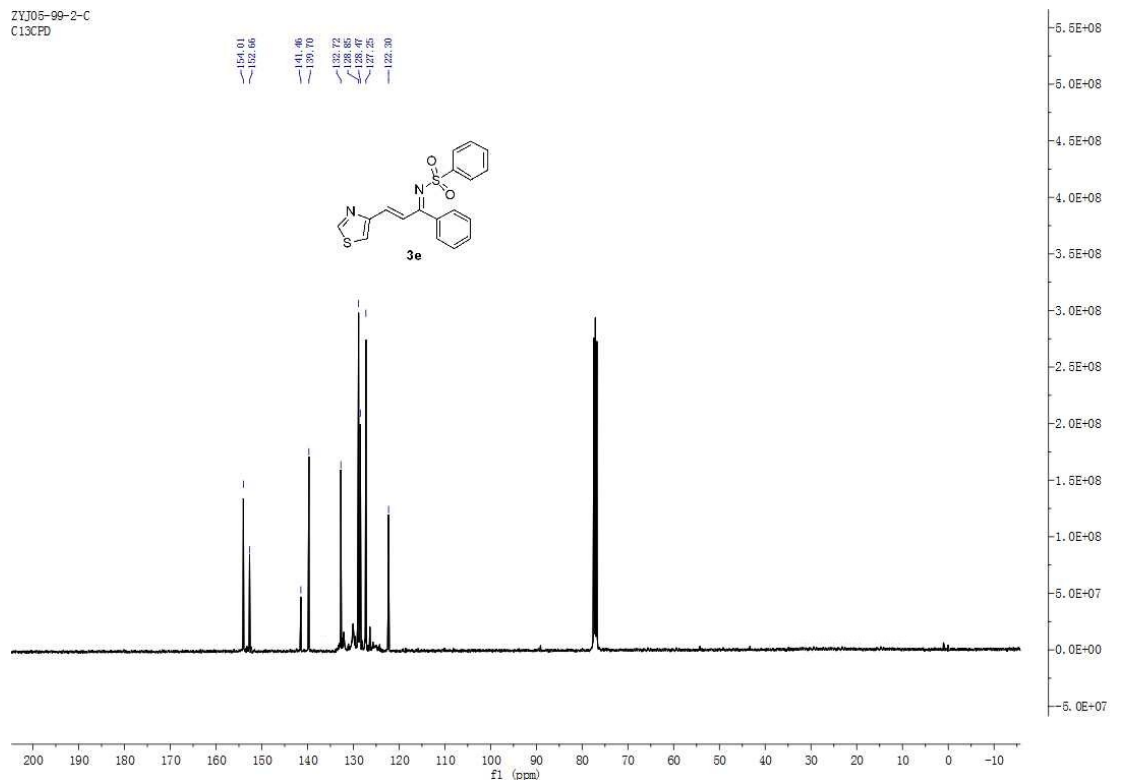
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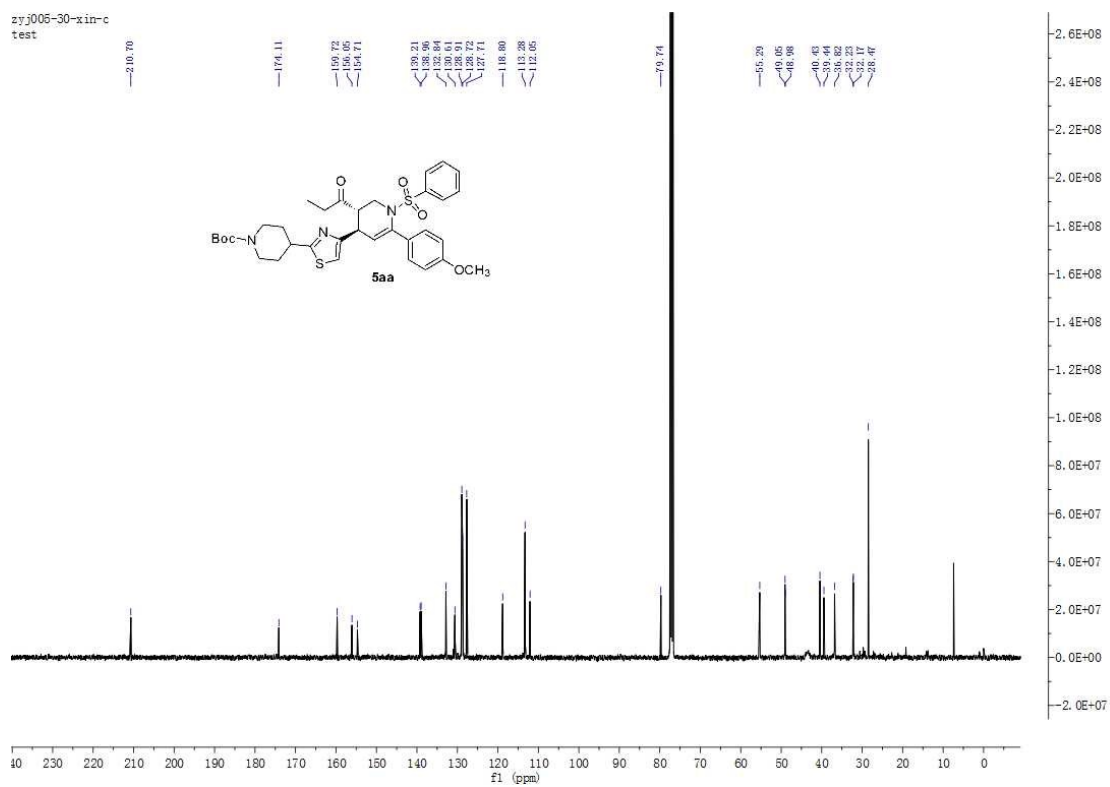
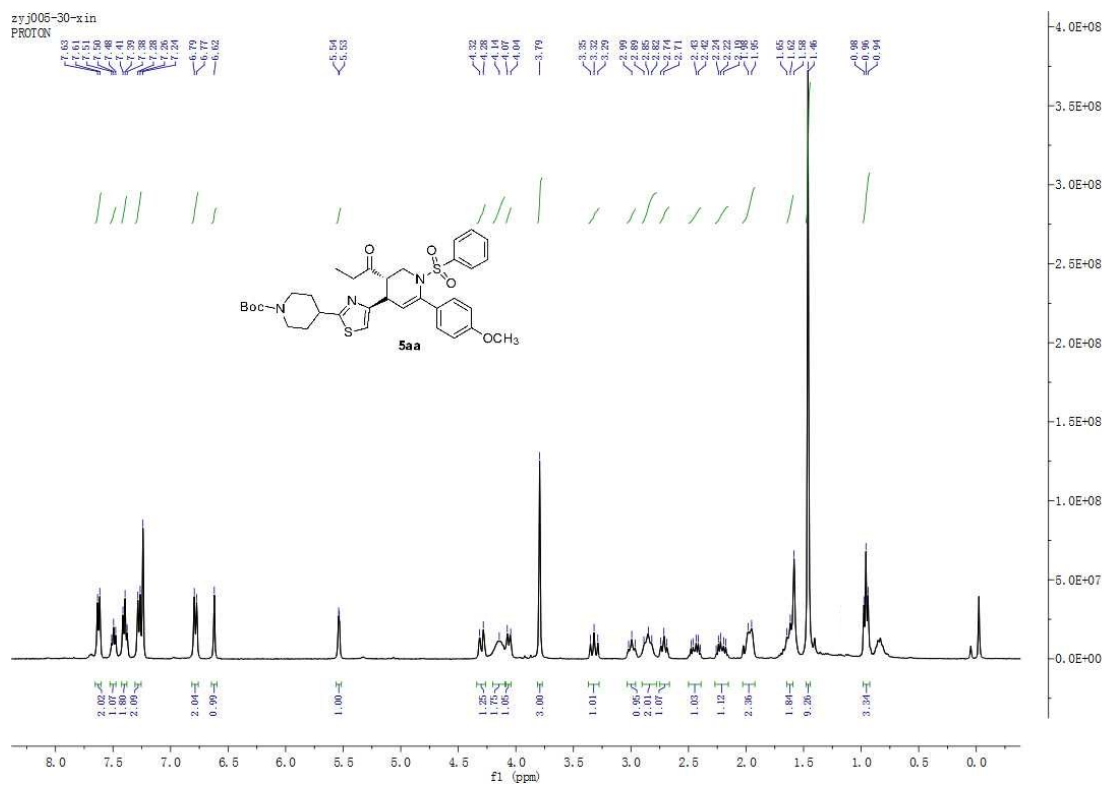


ZYJ05-99-2  
PROTON



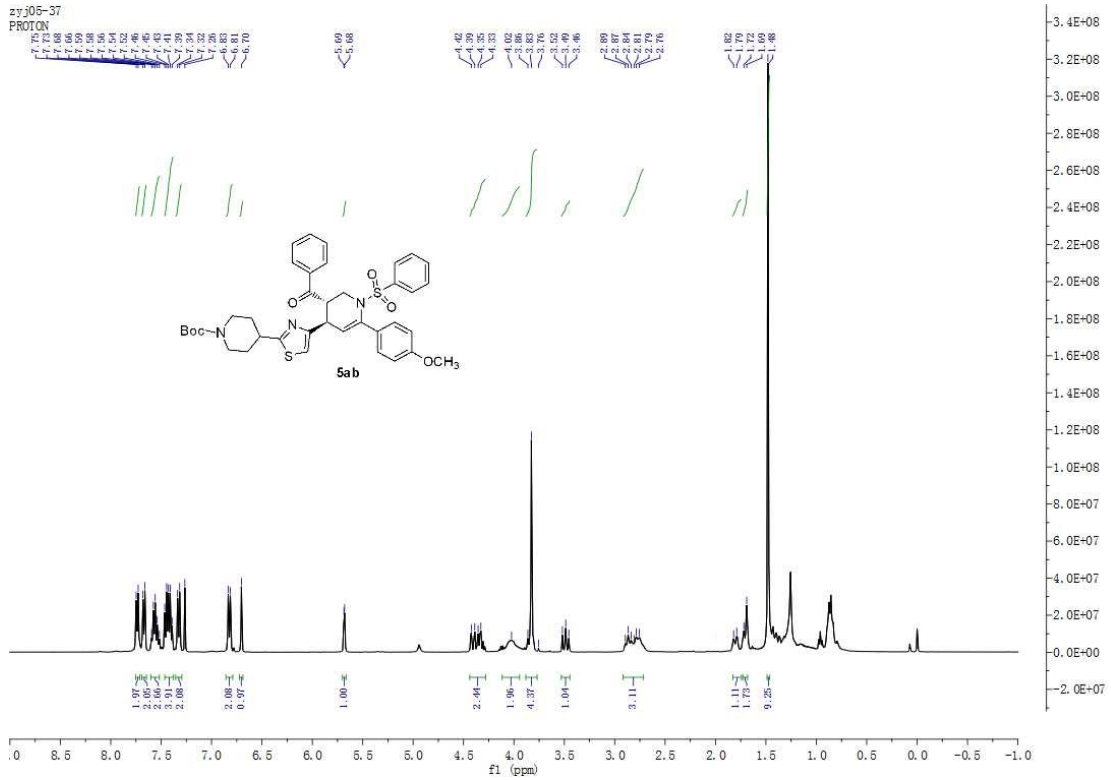
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C13CPD





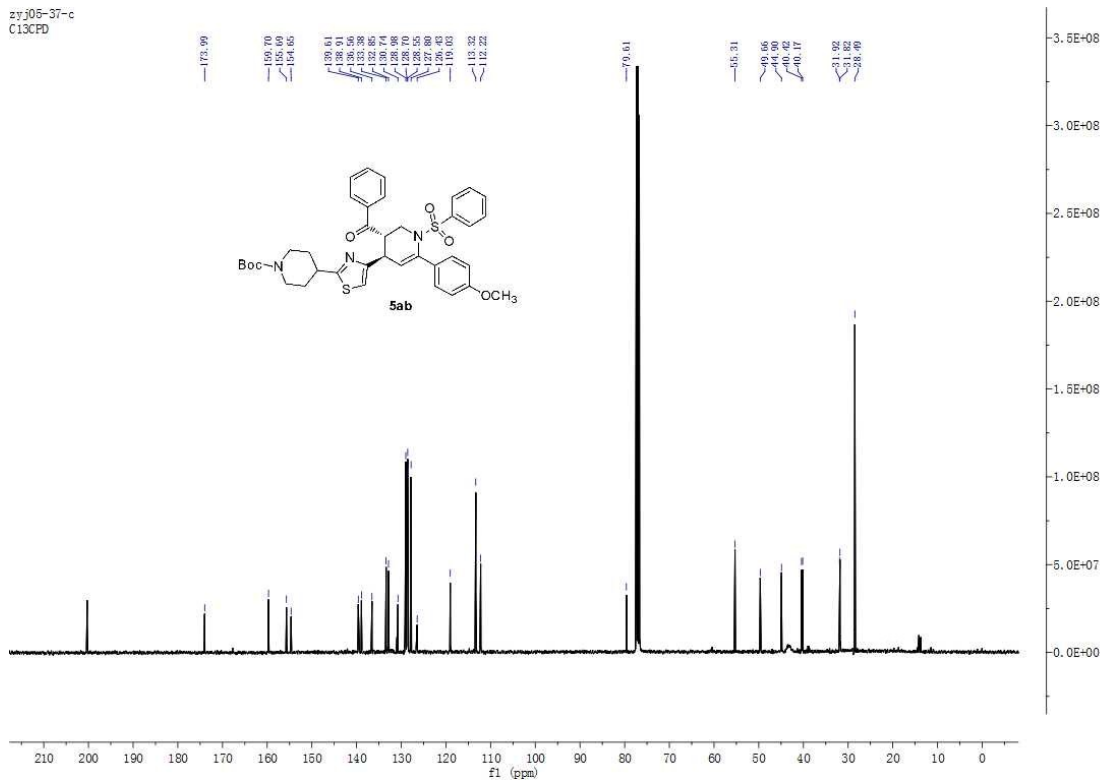
zyj05-37

PROTON

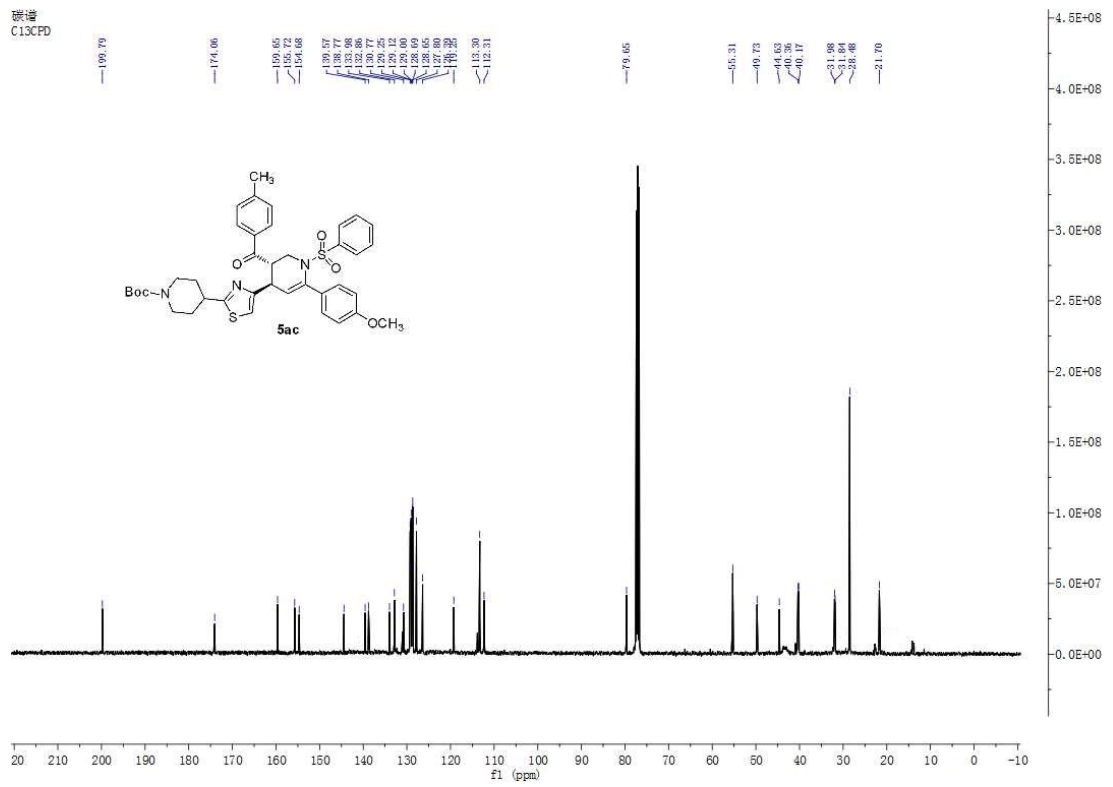
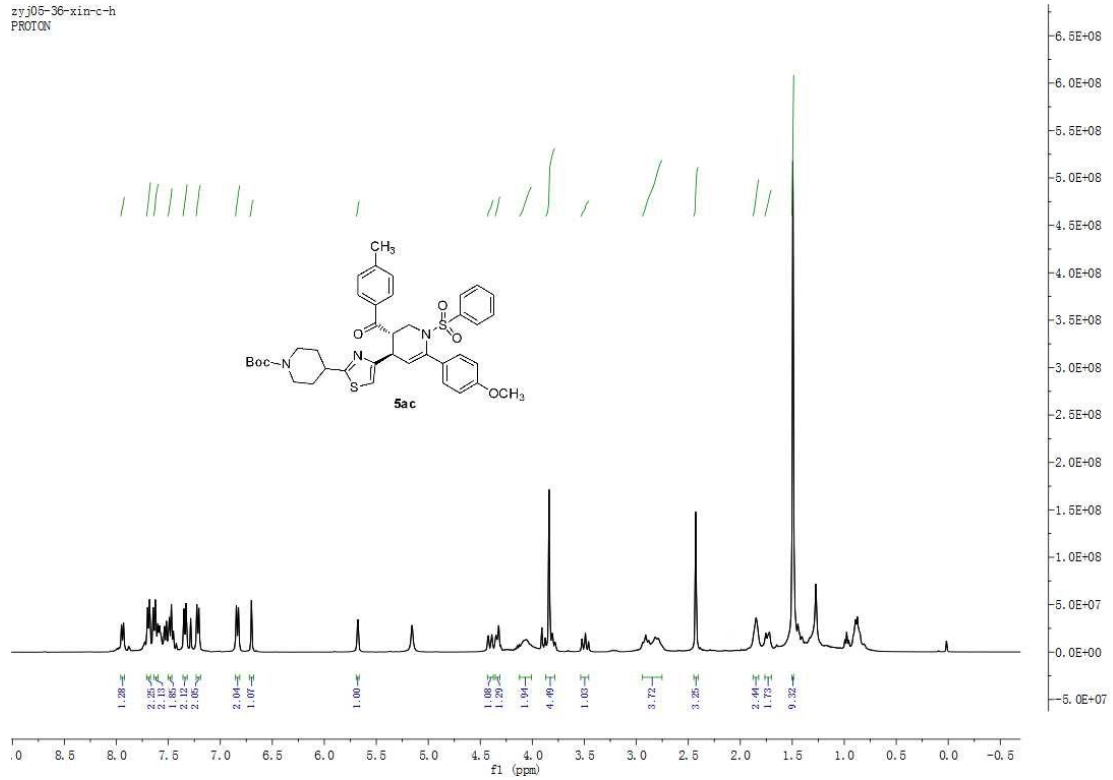


zyj05-37-c

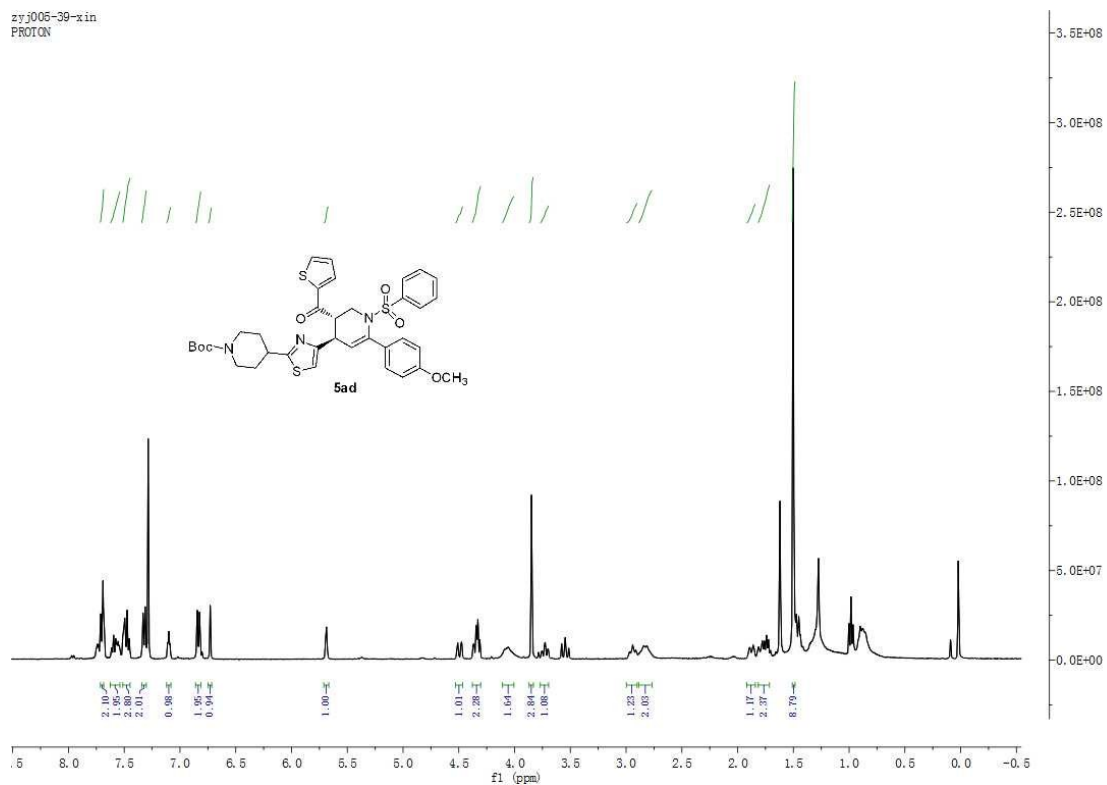
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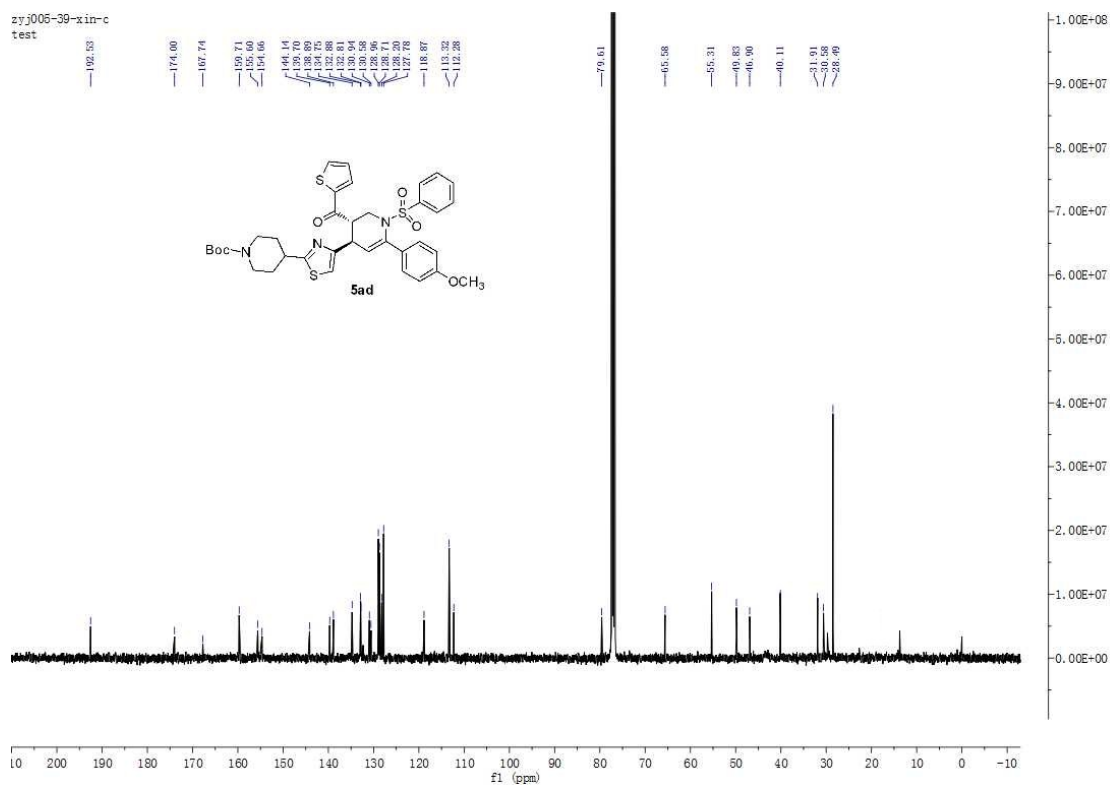
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PROTON



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test



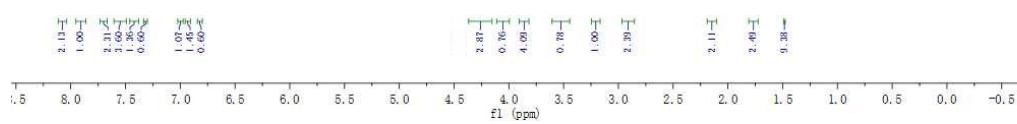
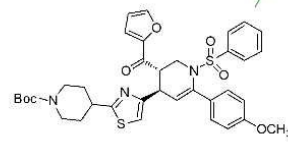
zyj05-62-xin

PROTON

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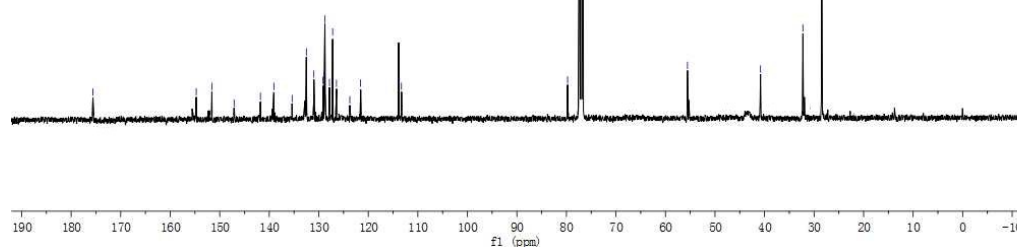
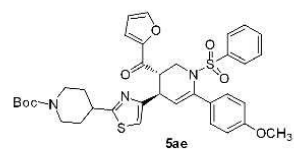
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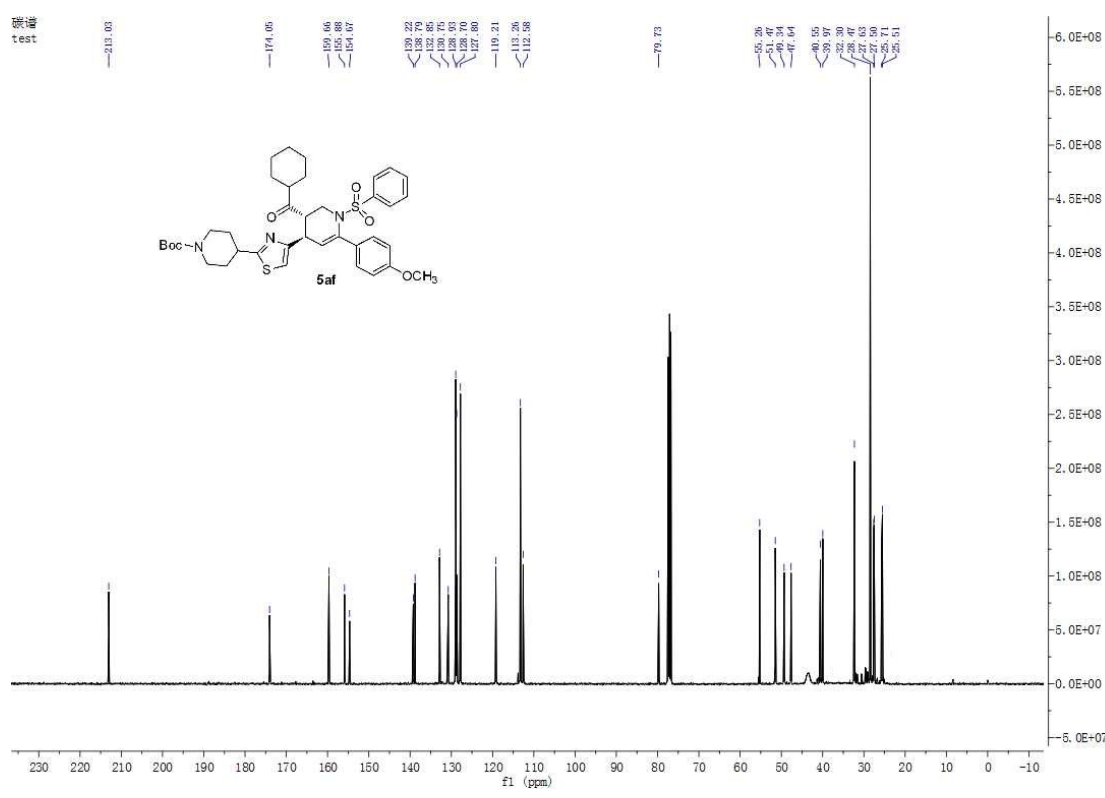
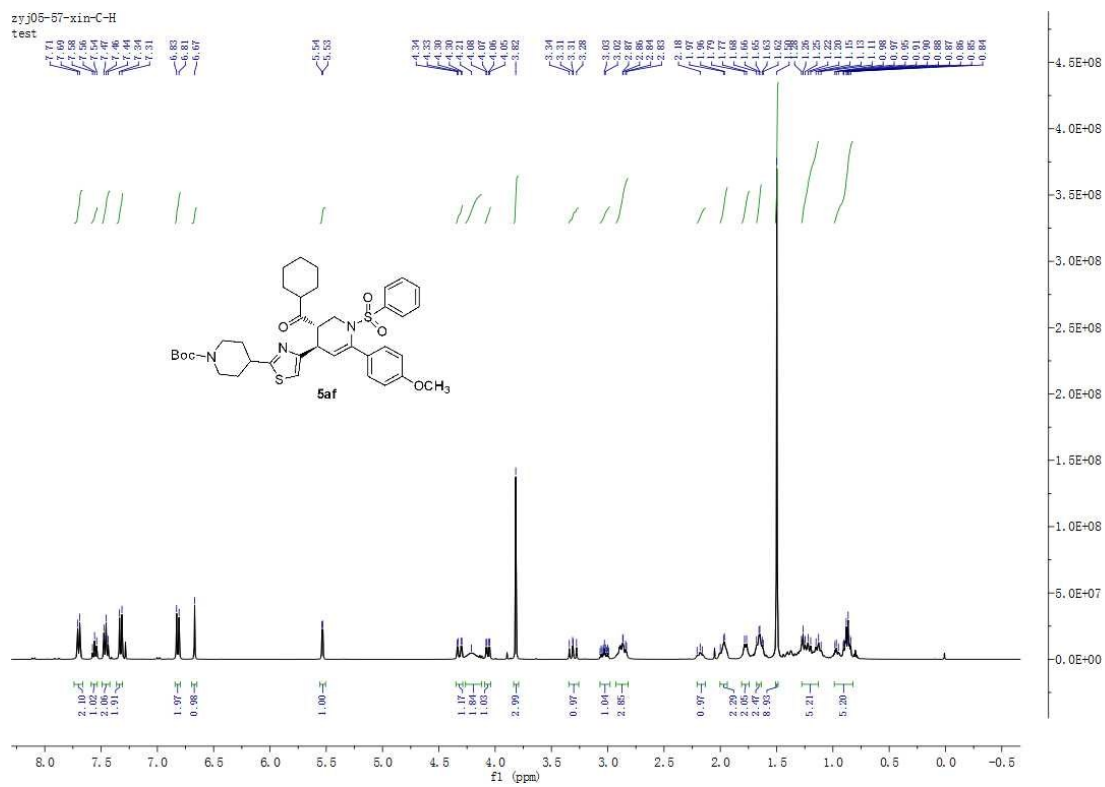
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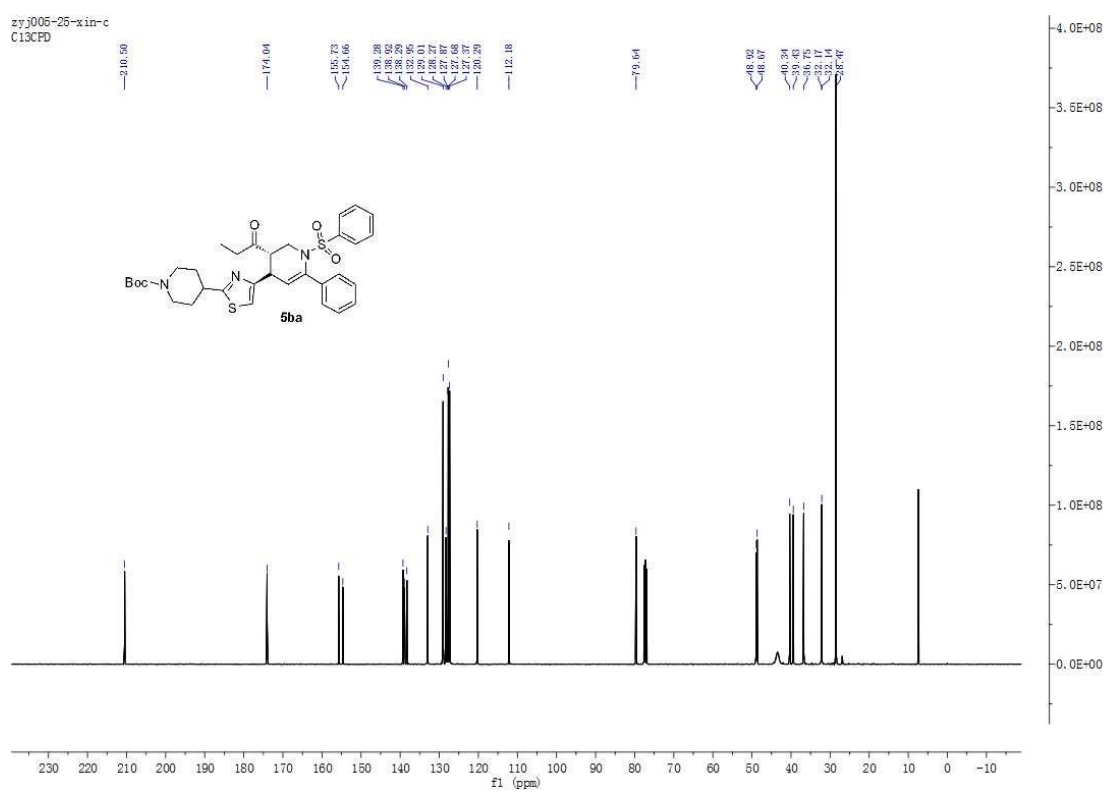
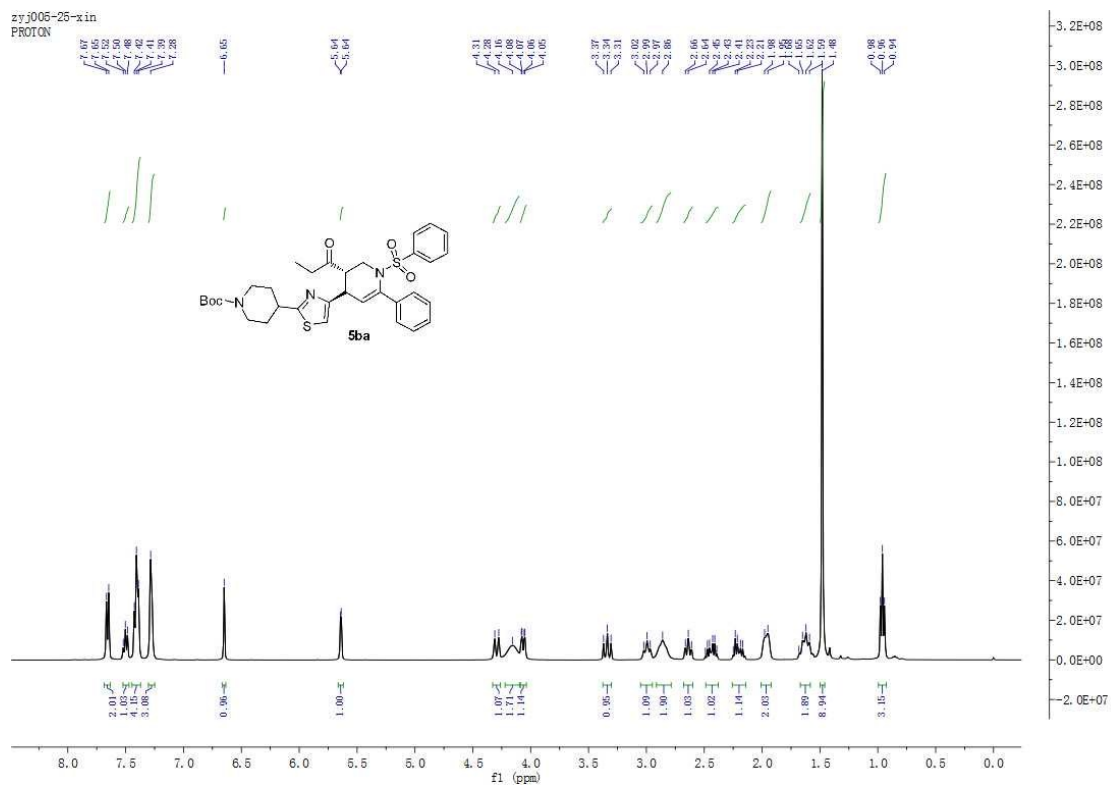
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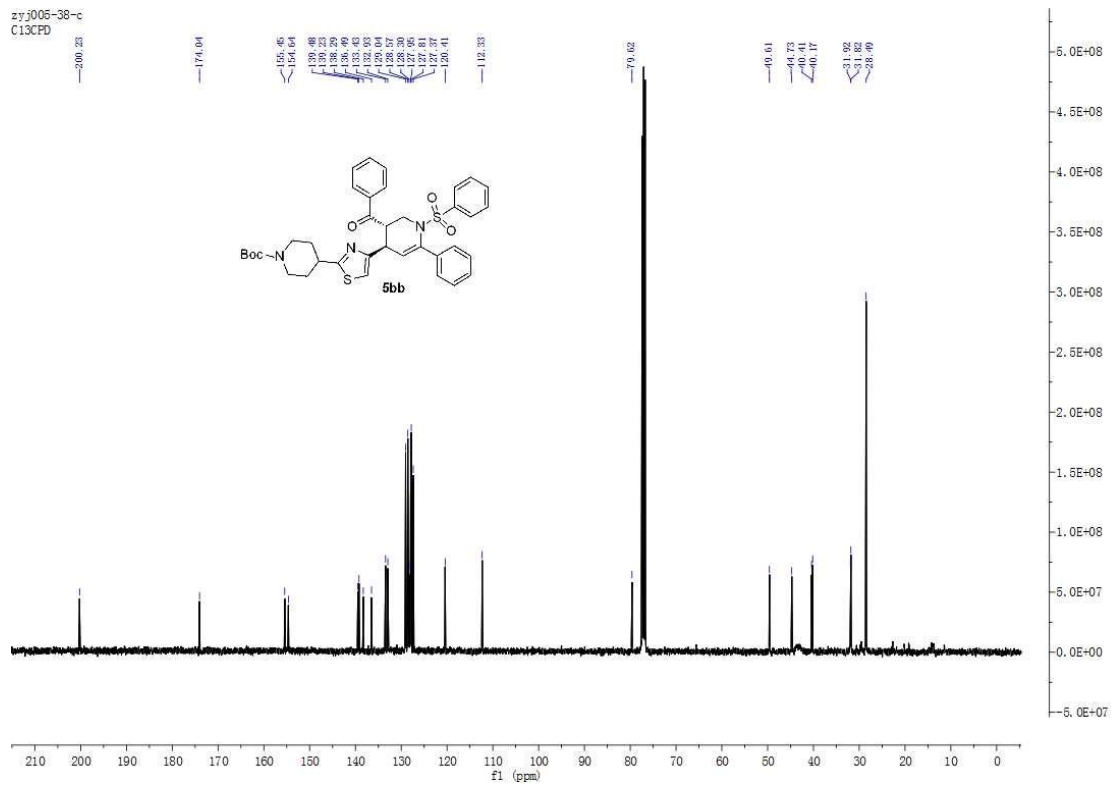
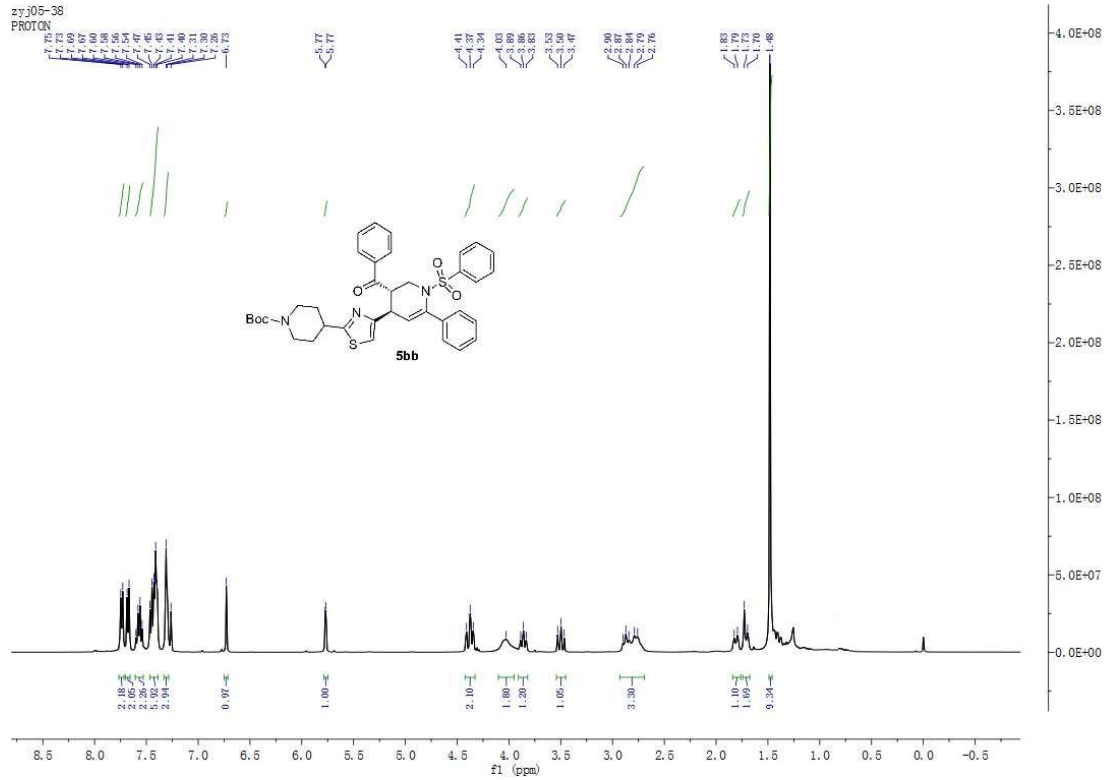
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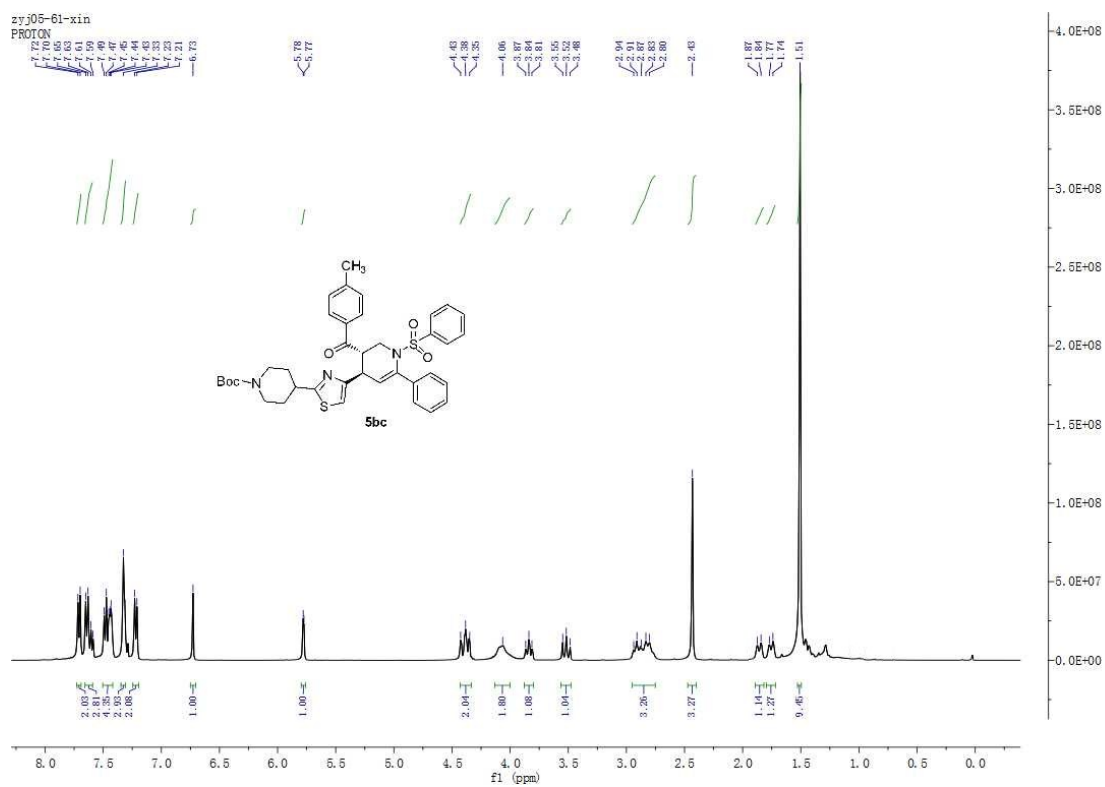
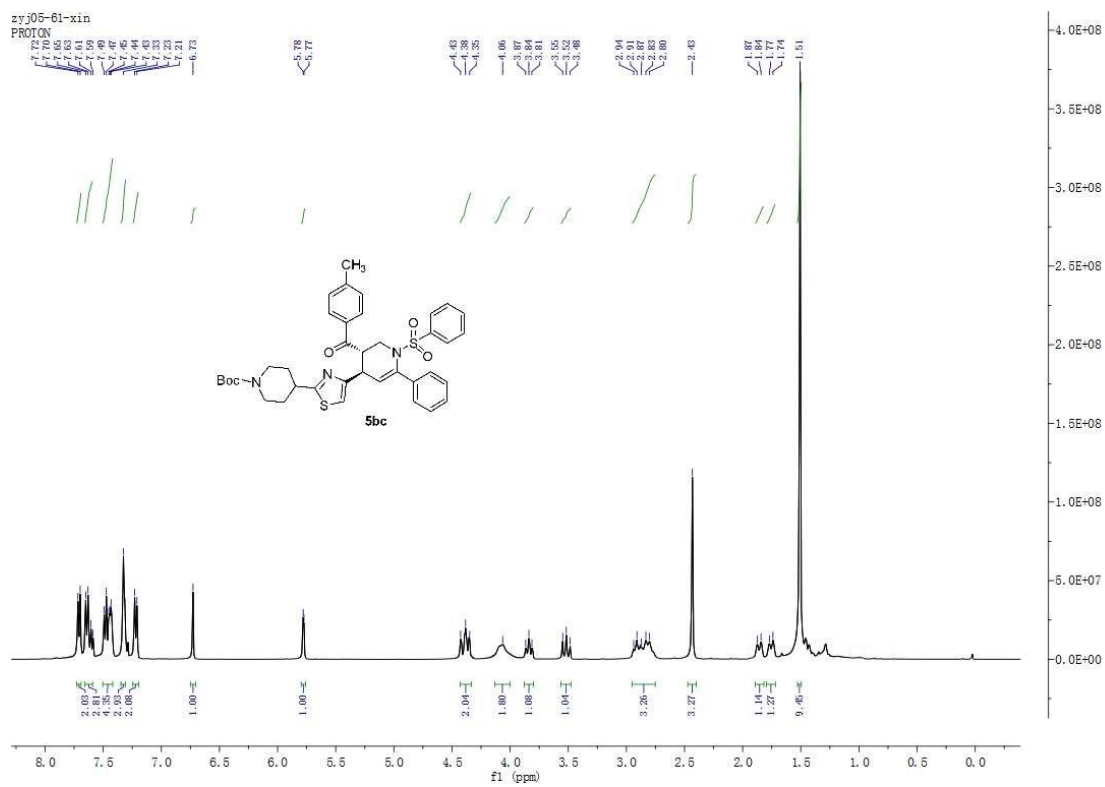


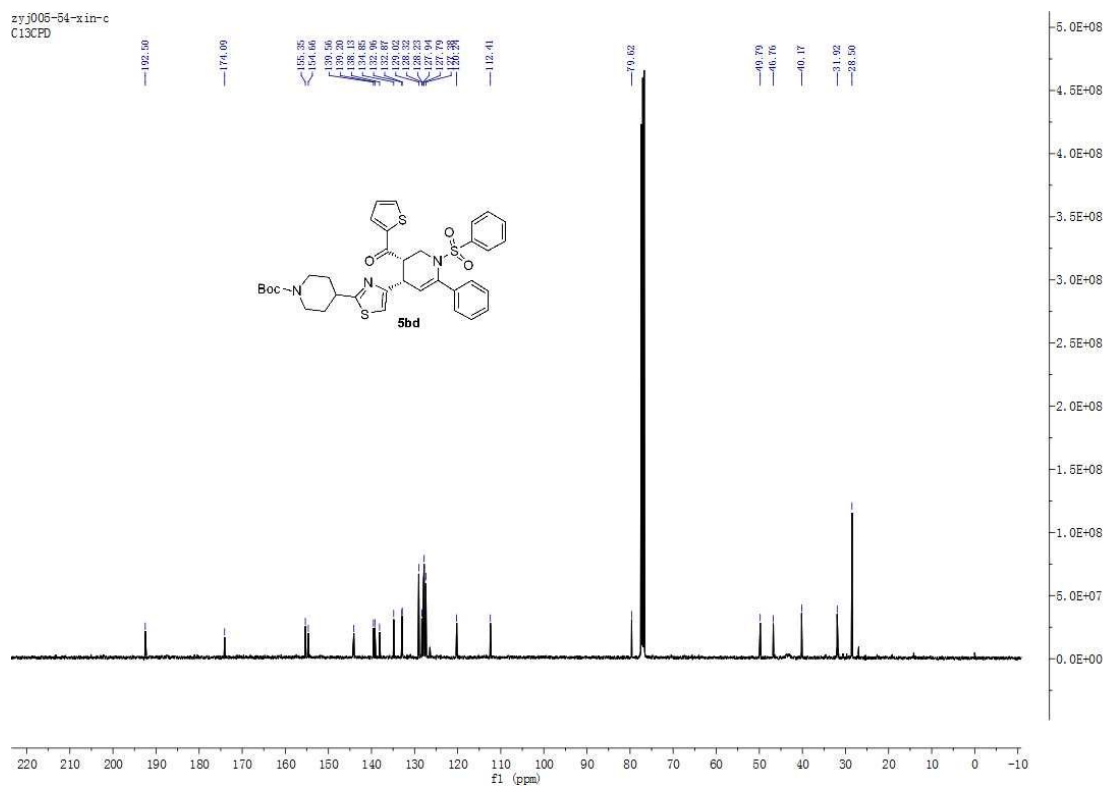
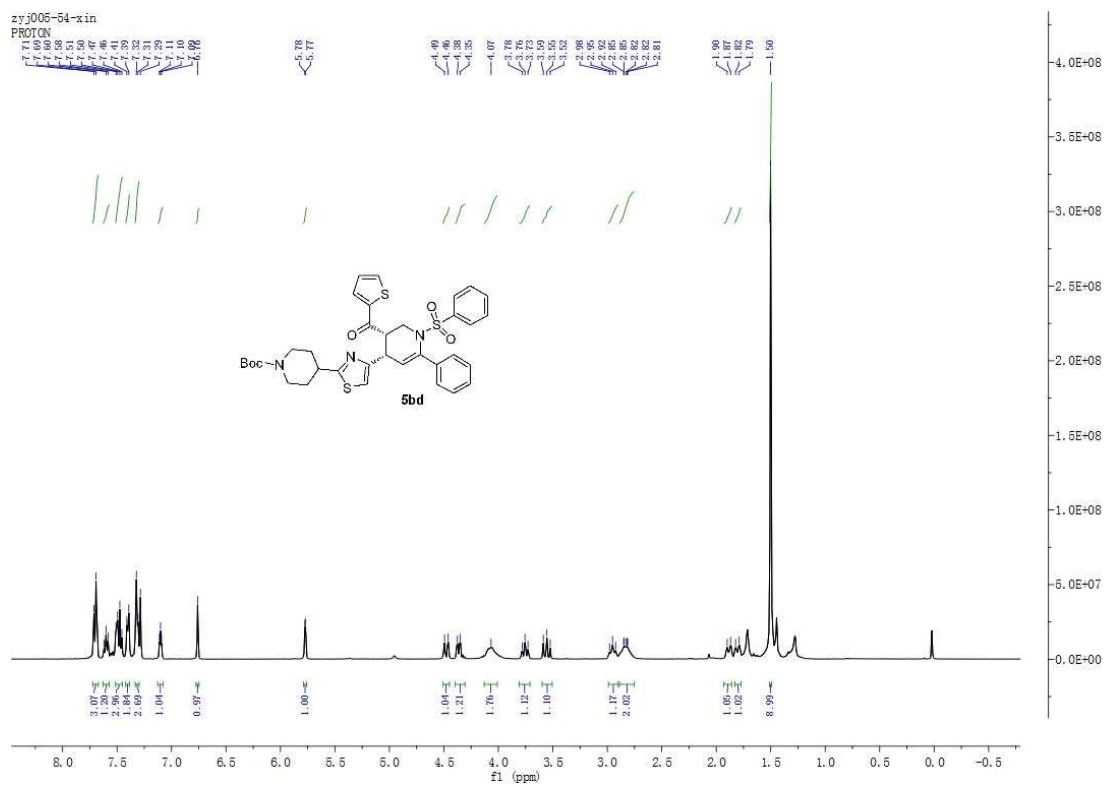


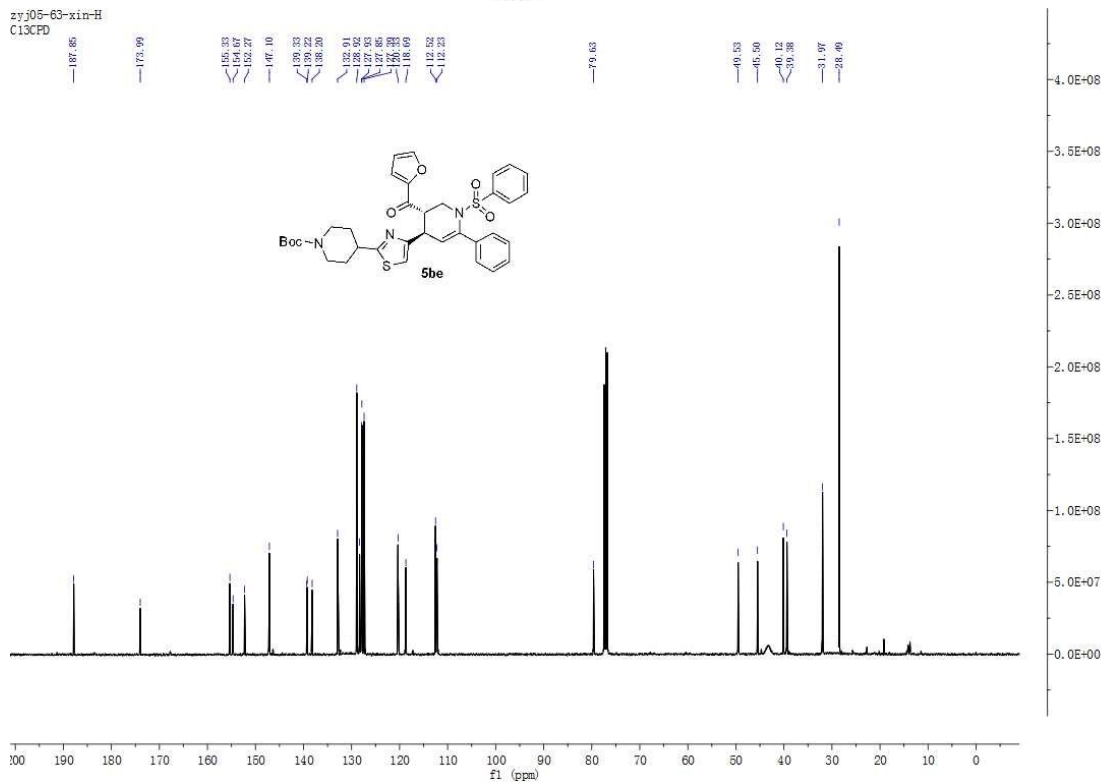
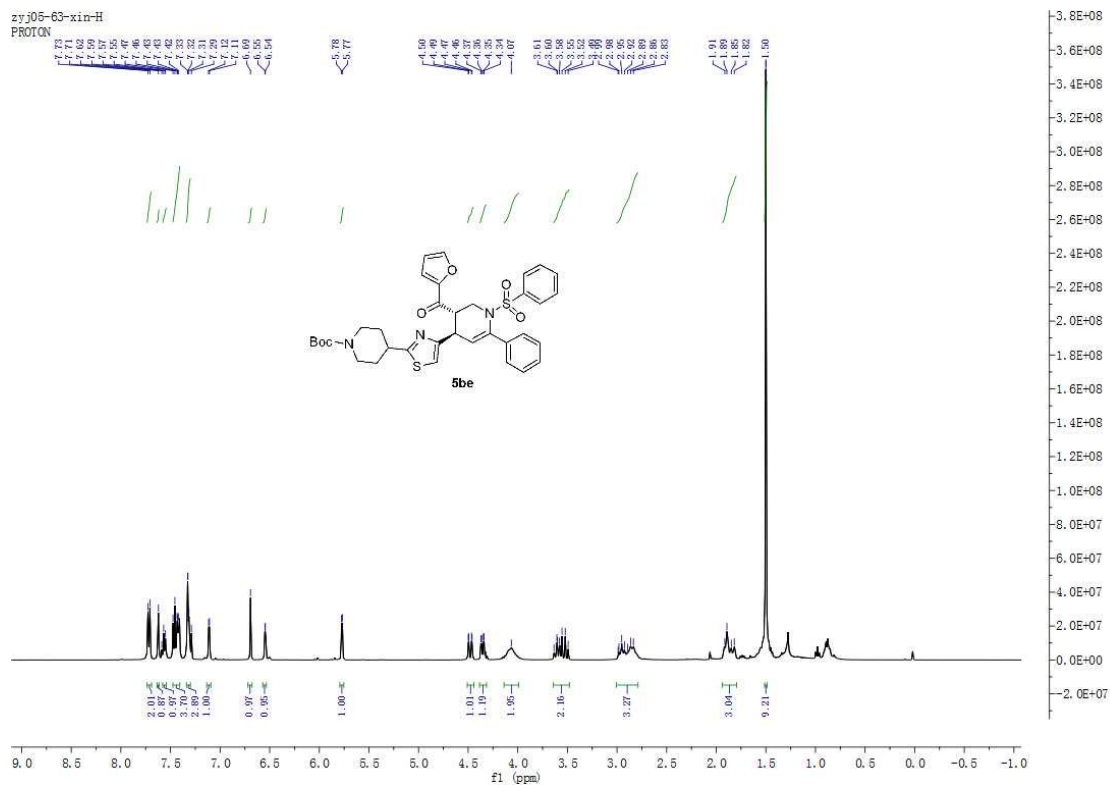


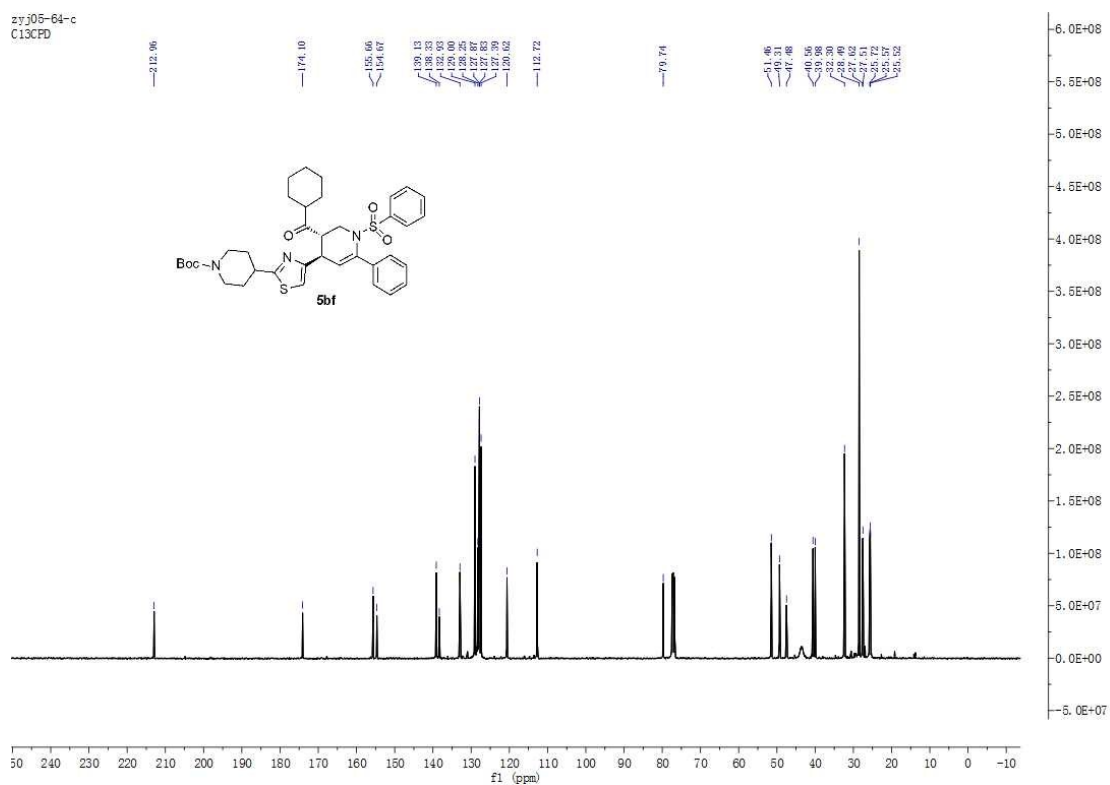
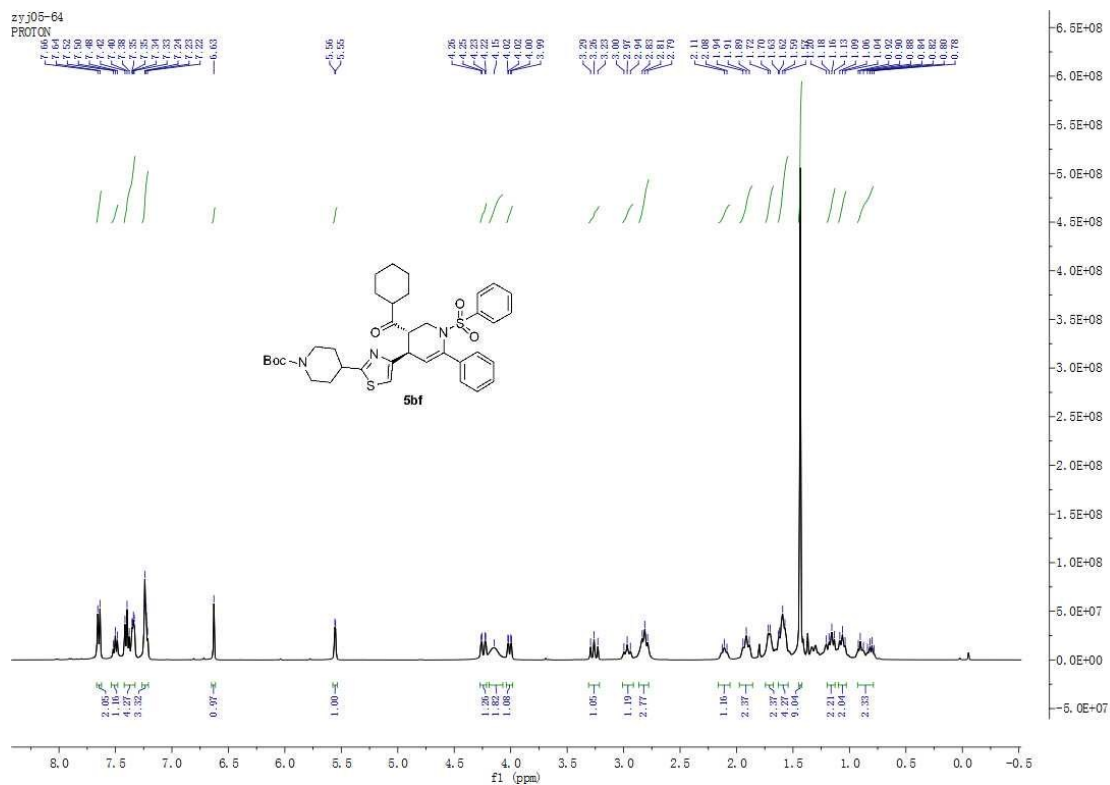


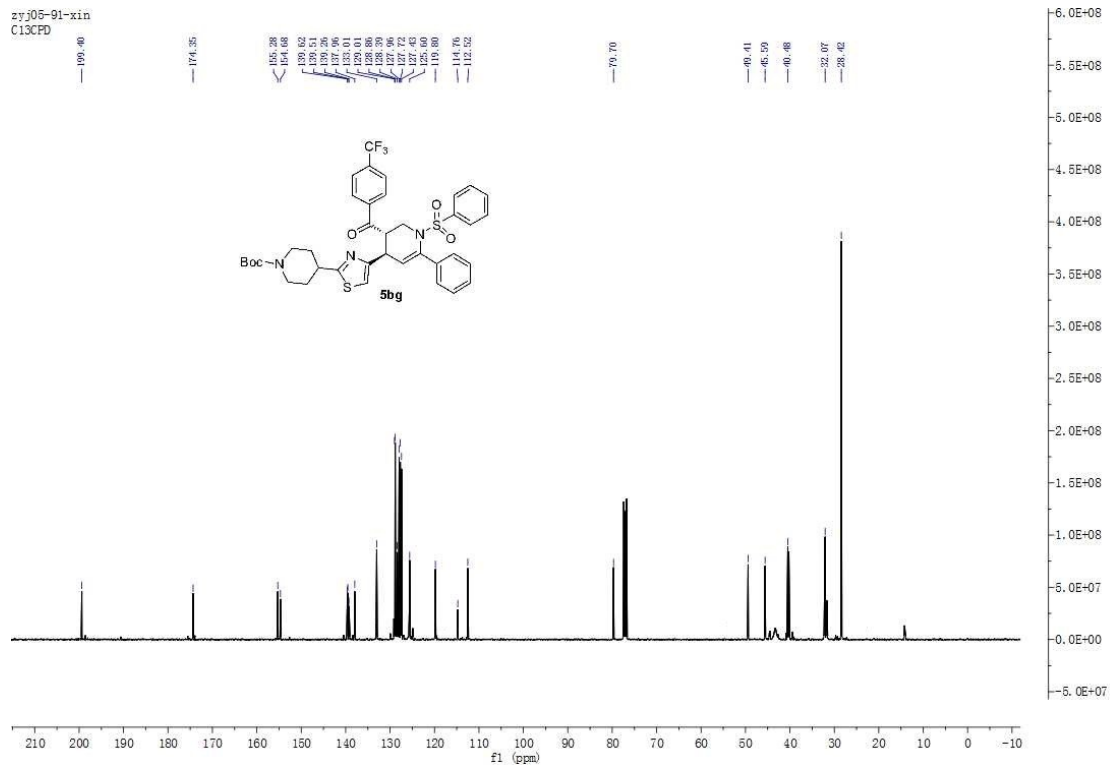
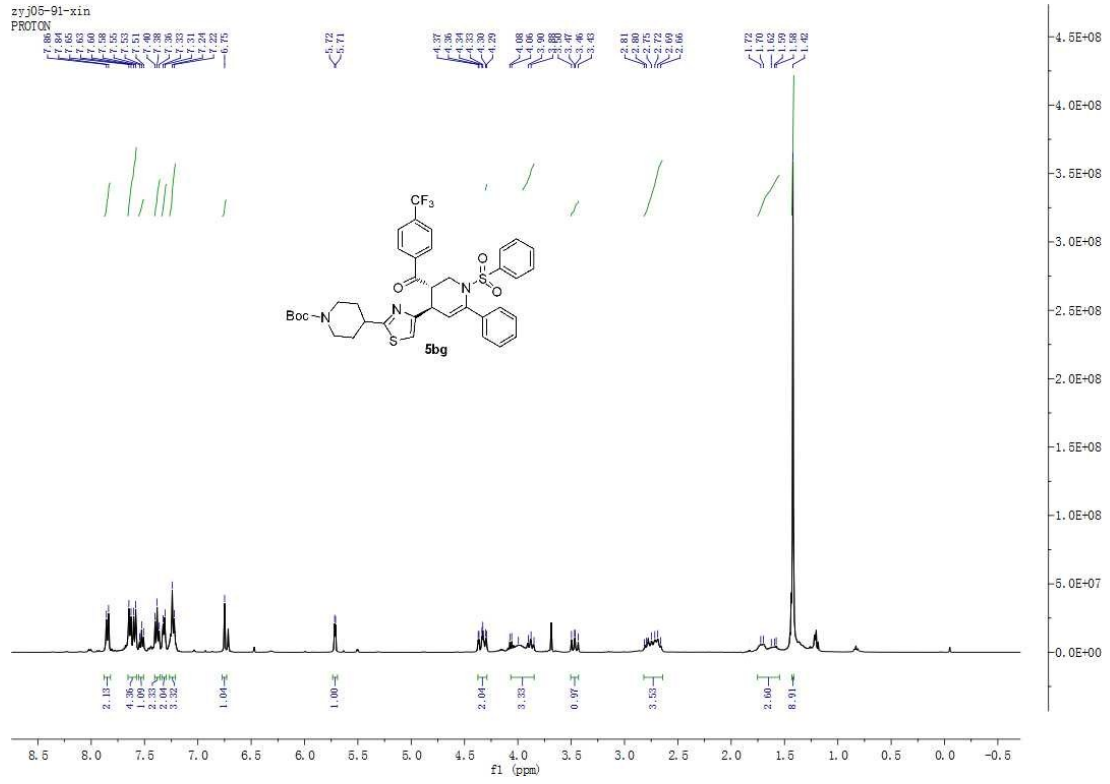




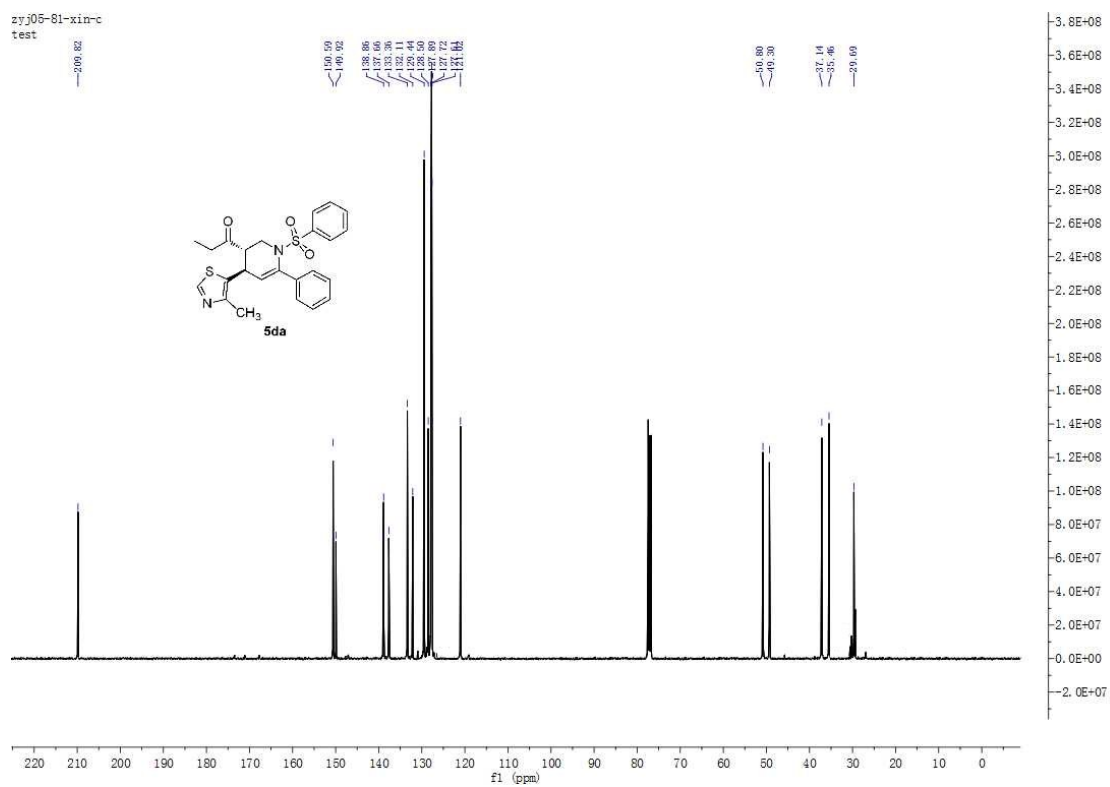
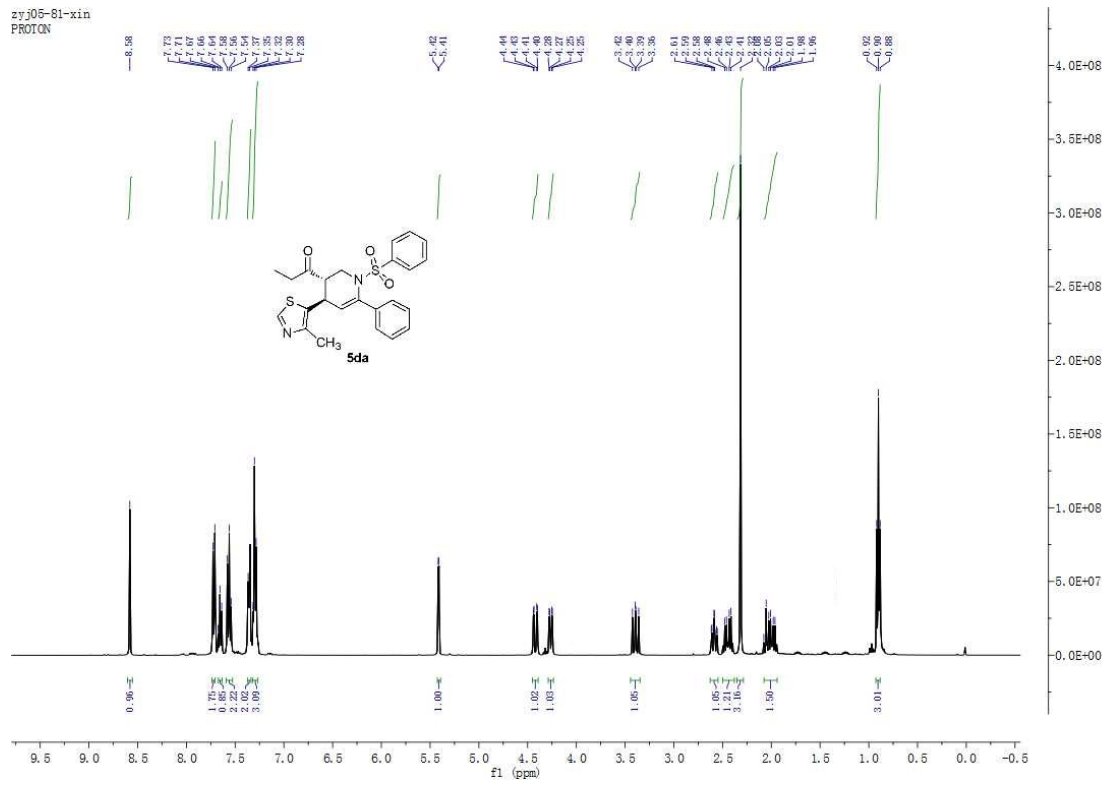




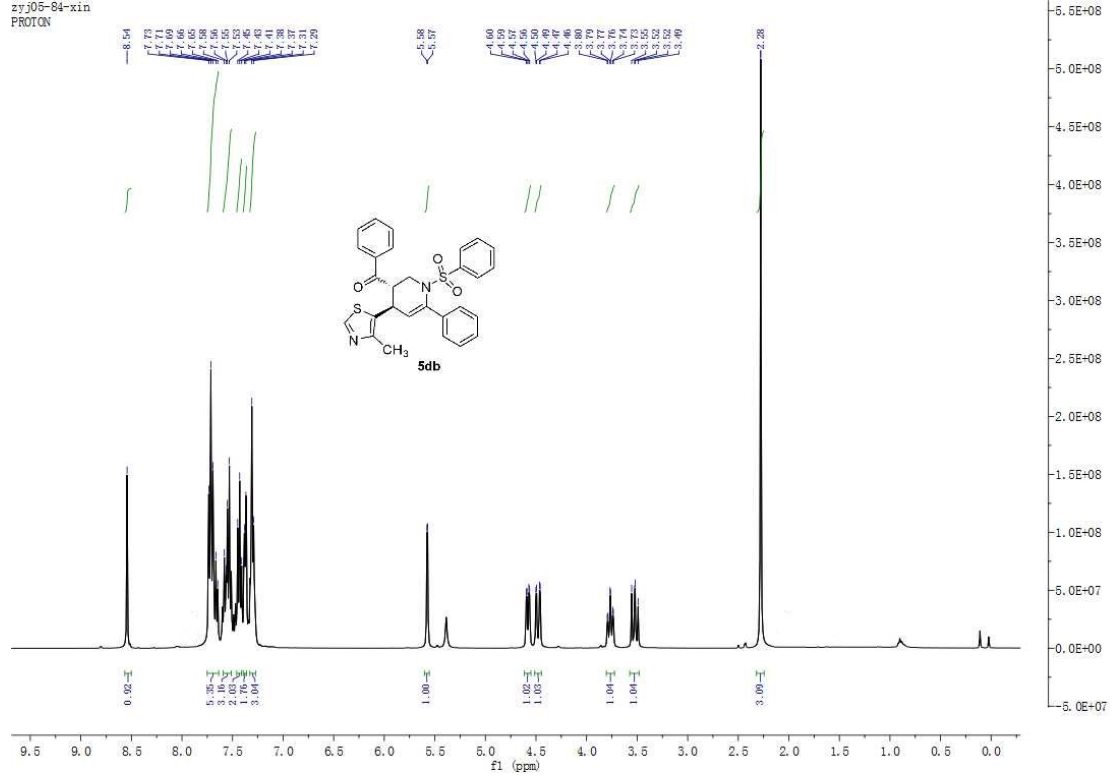




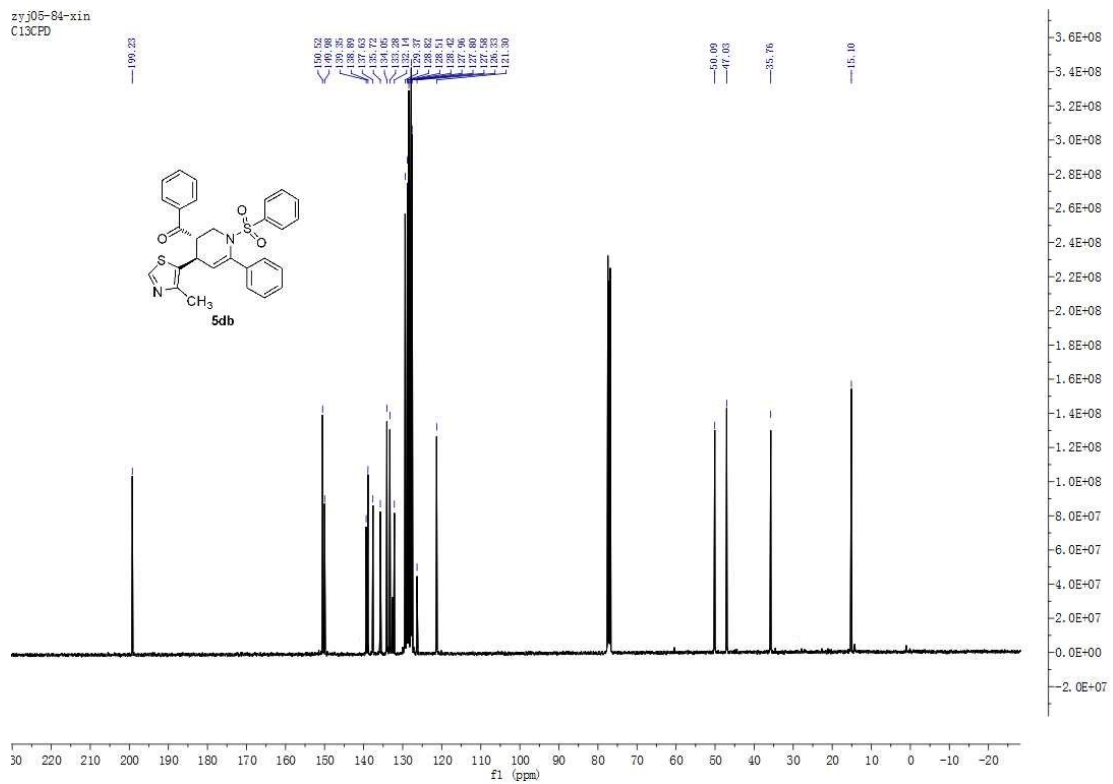


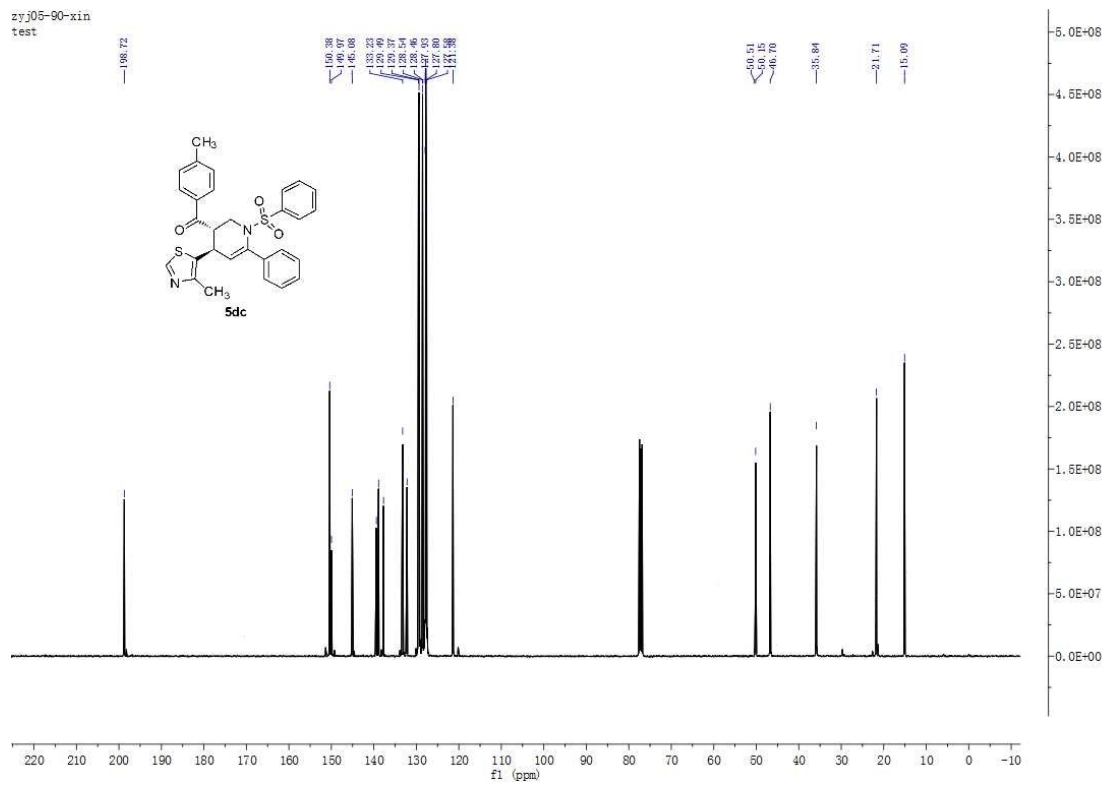
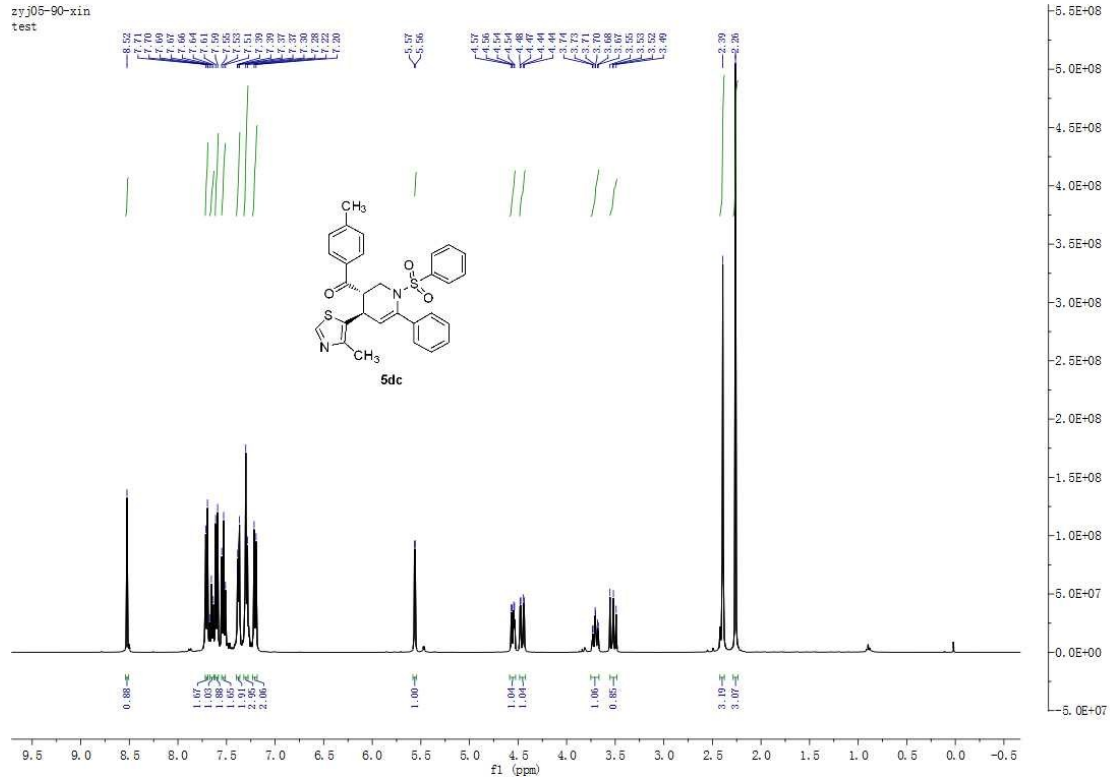


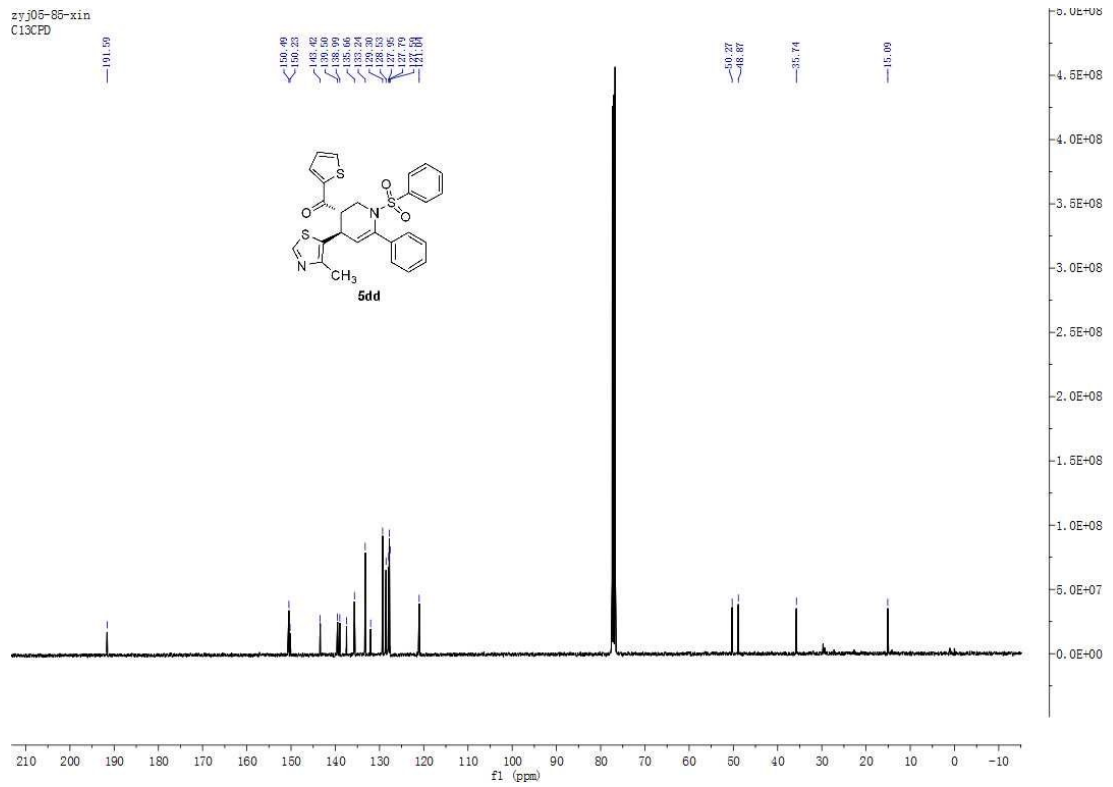
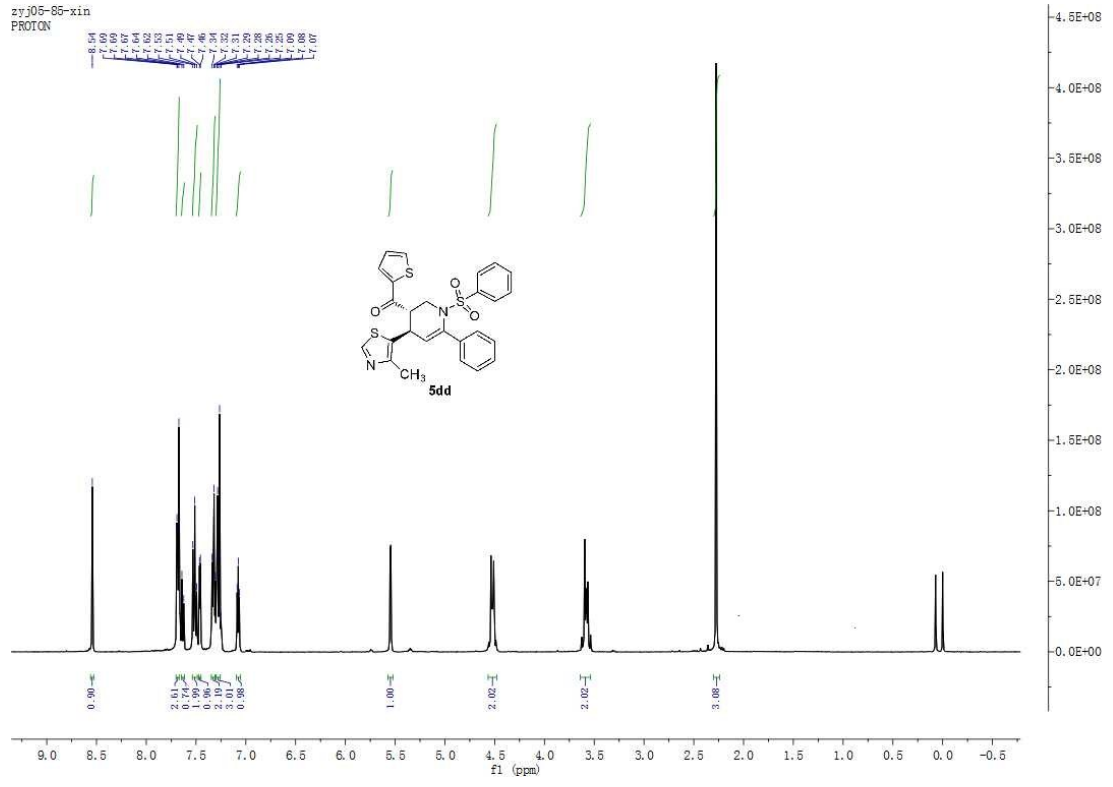
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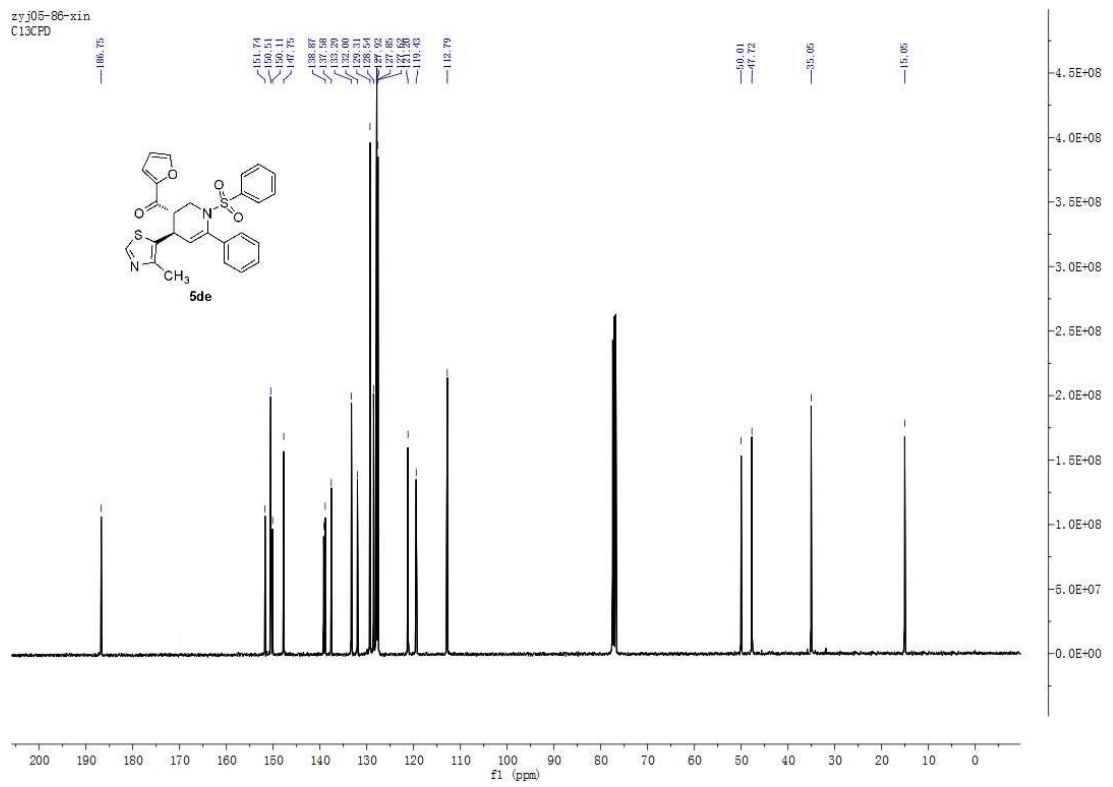
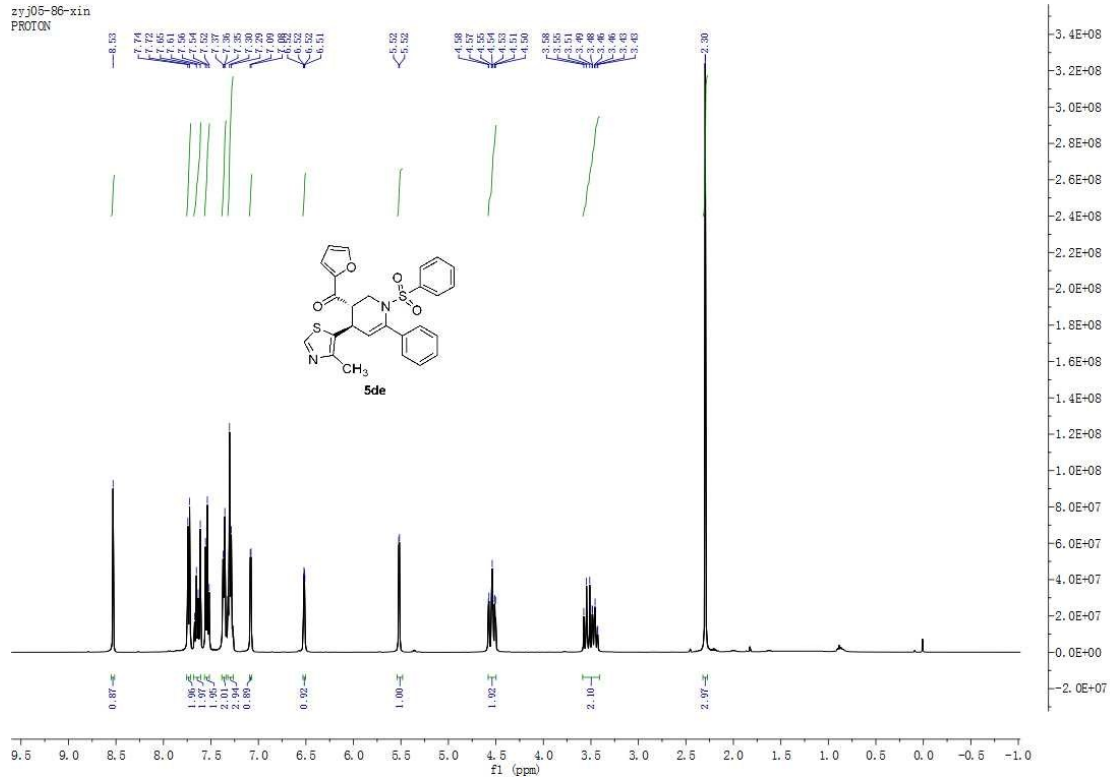


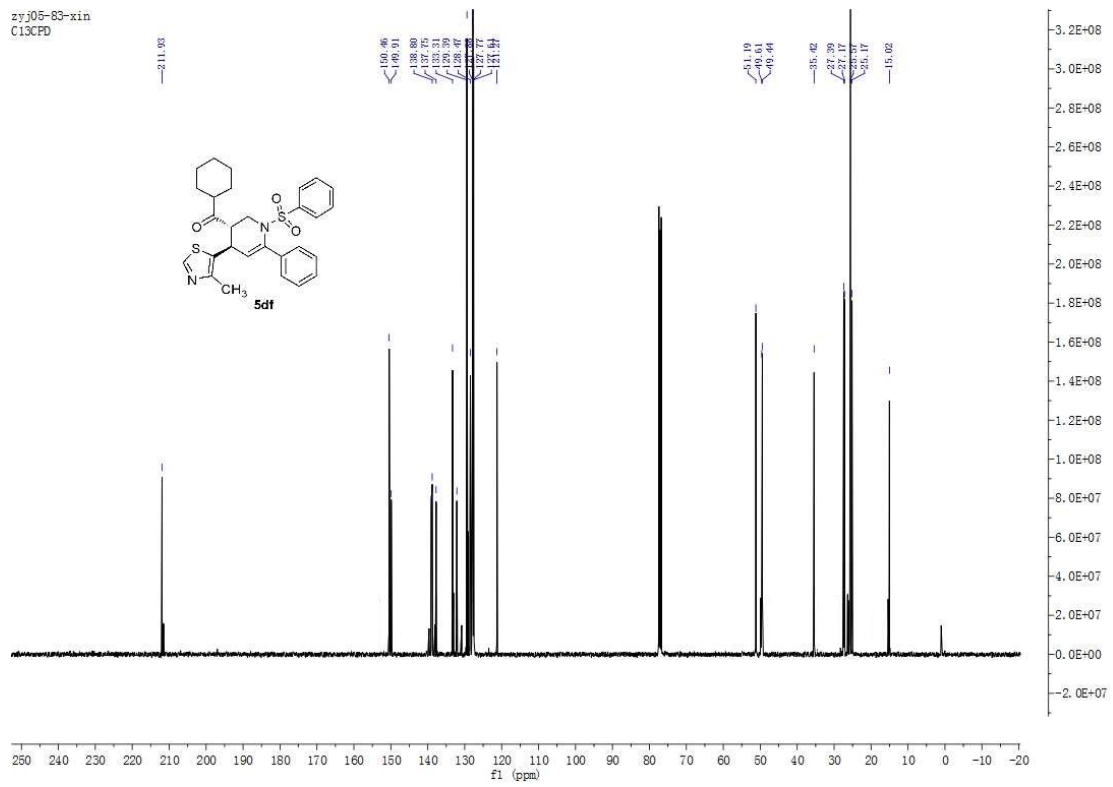
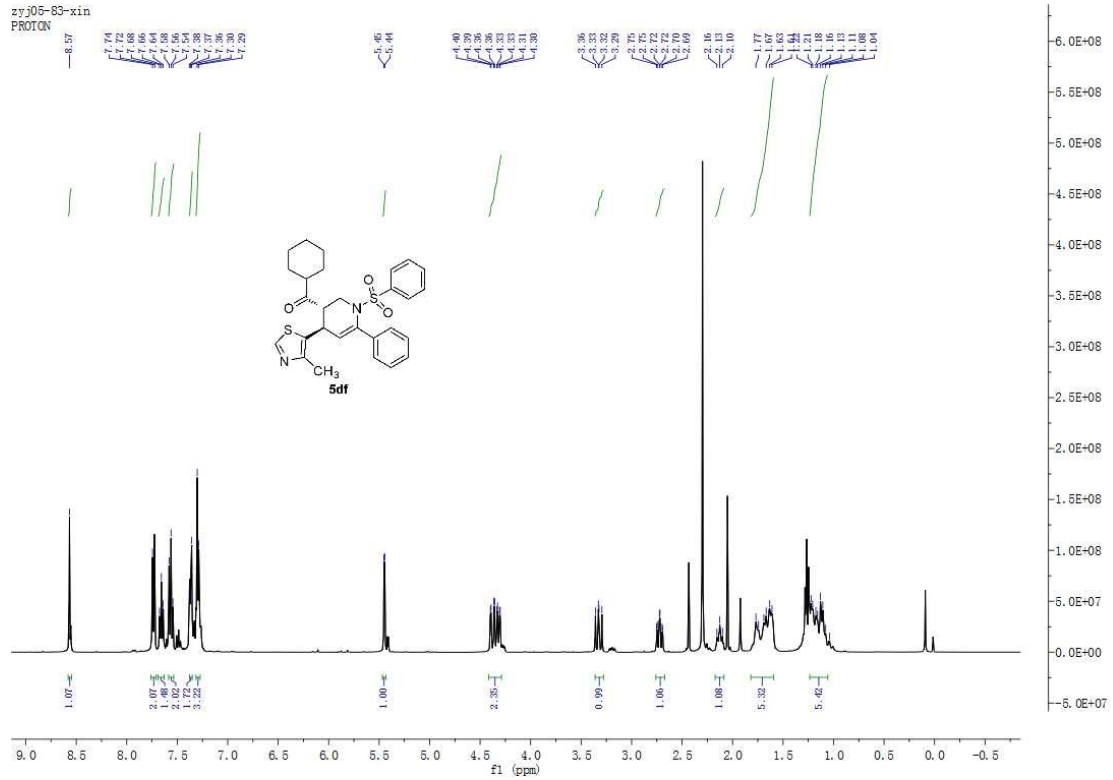
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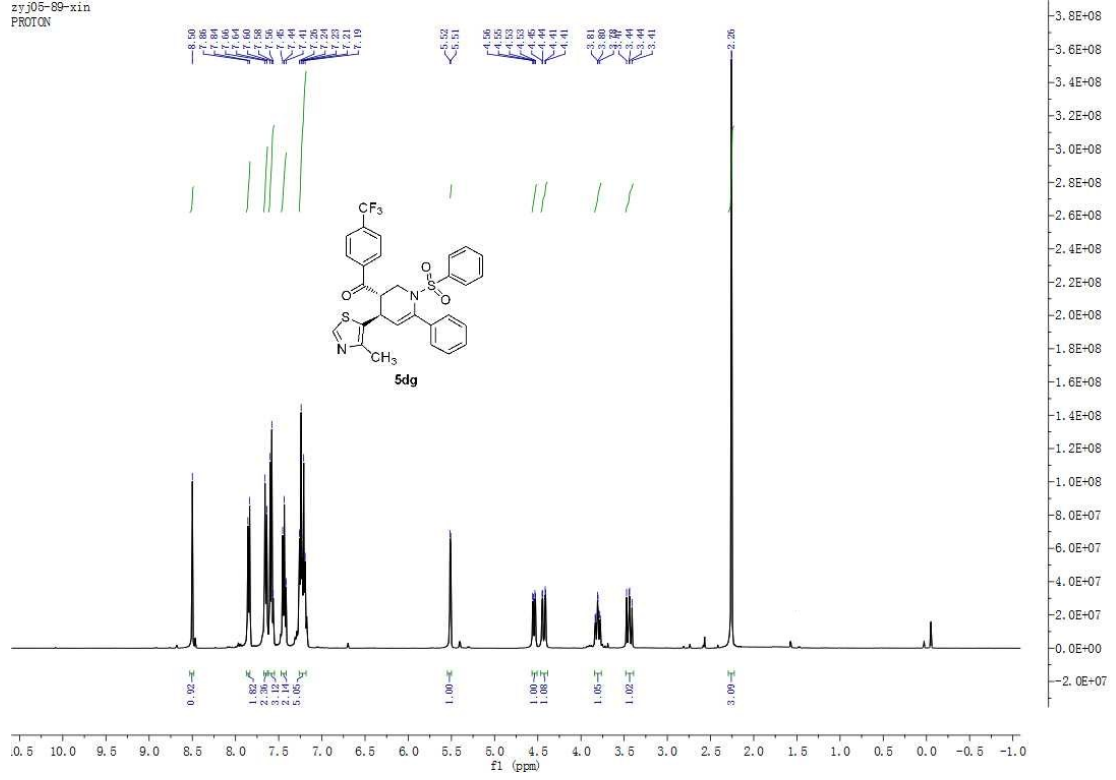




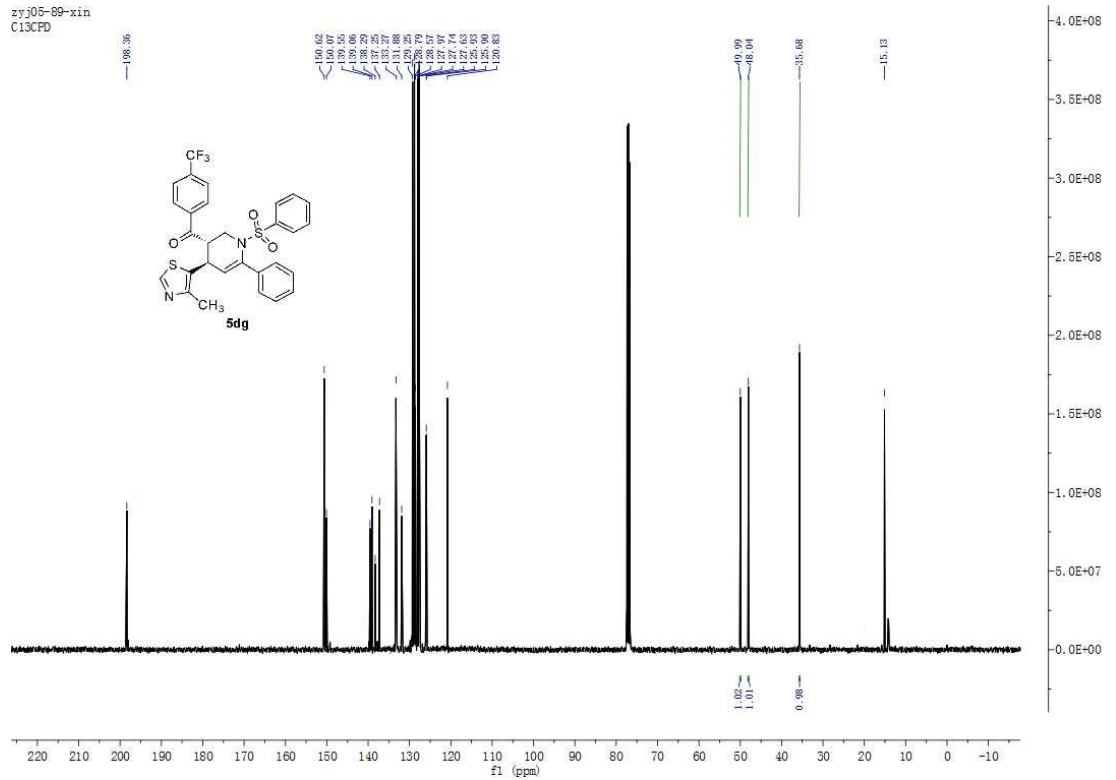


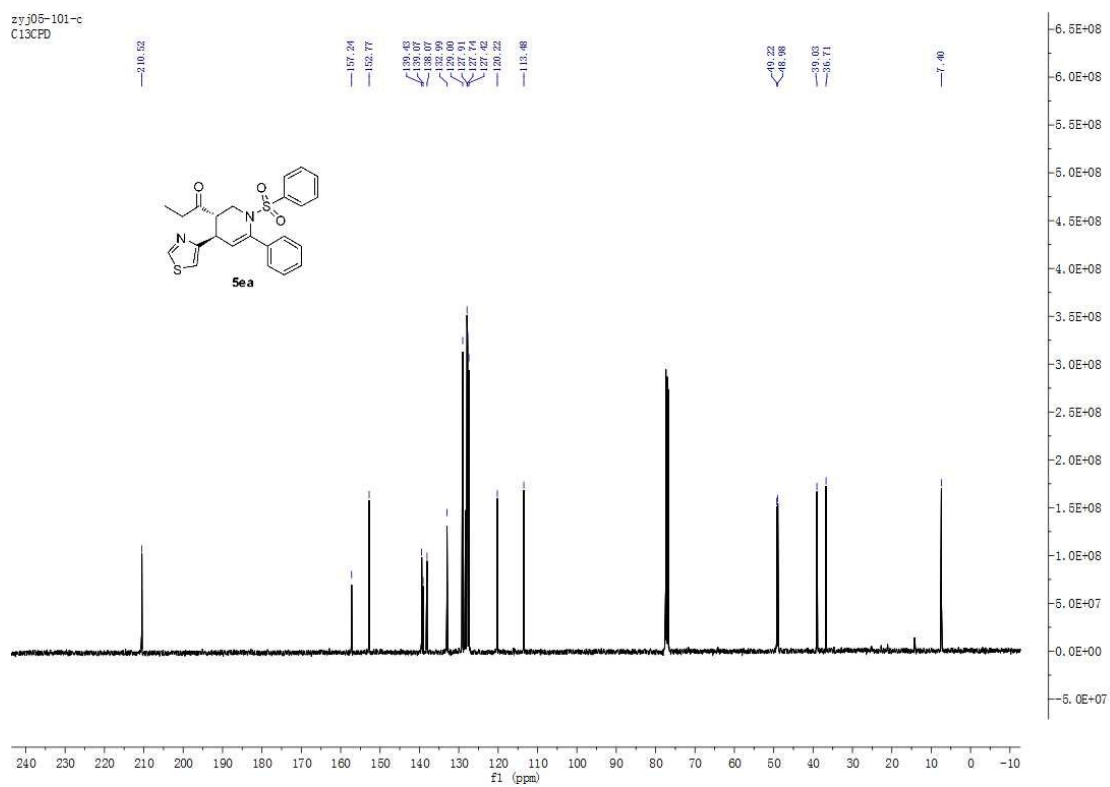
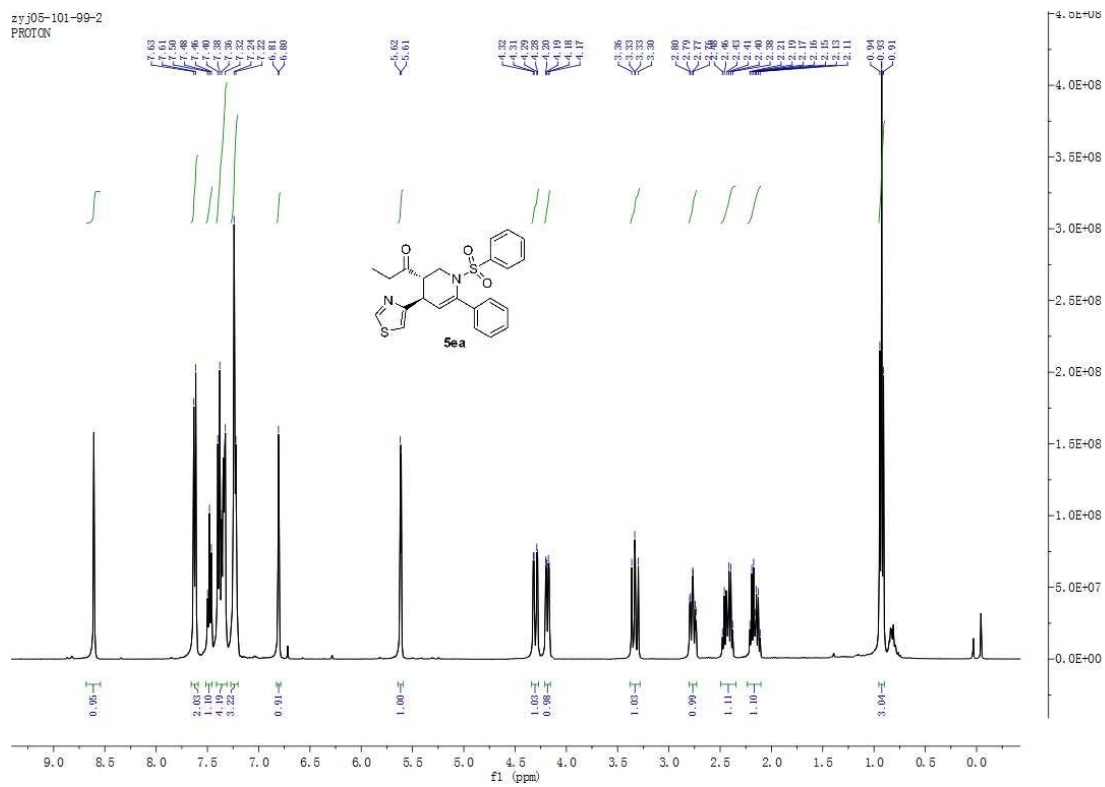


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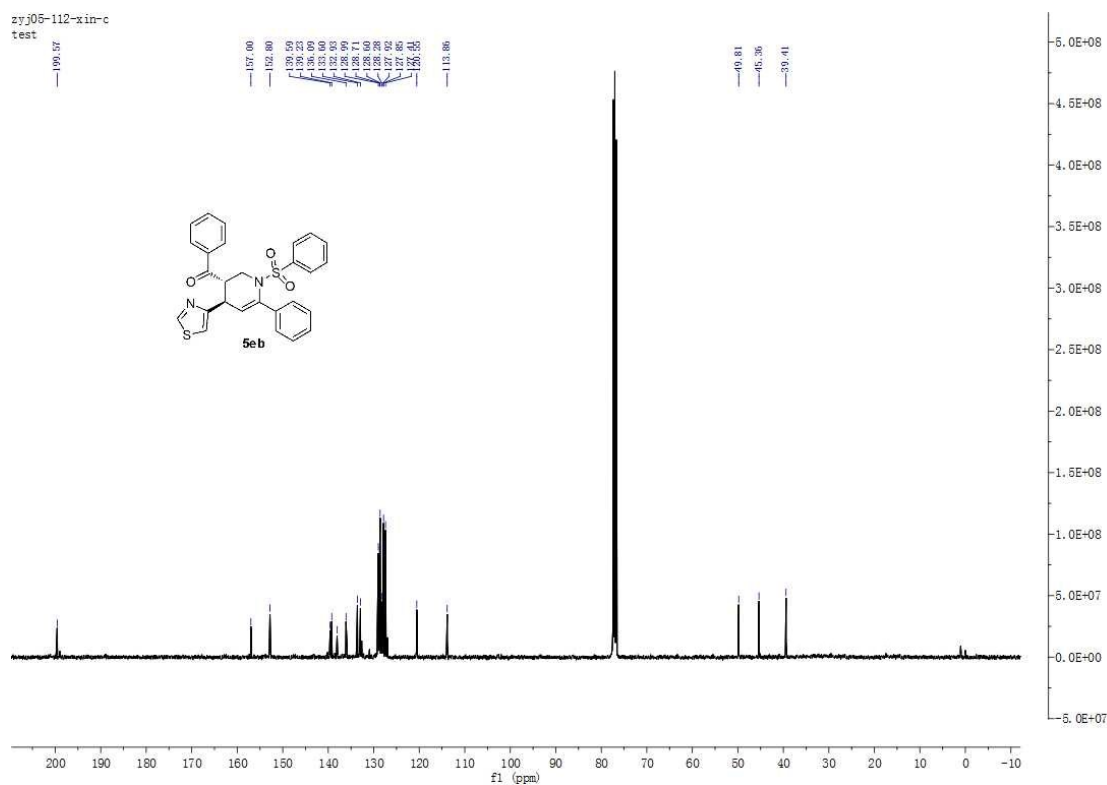
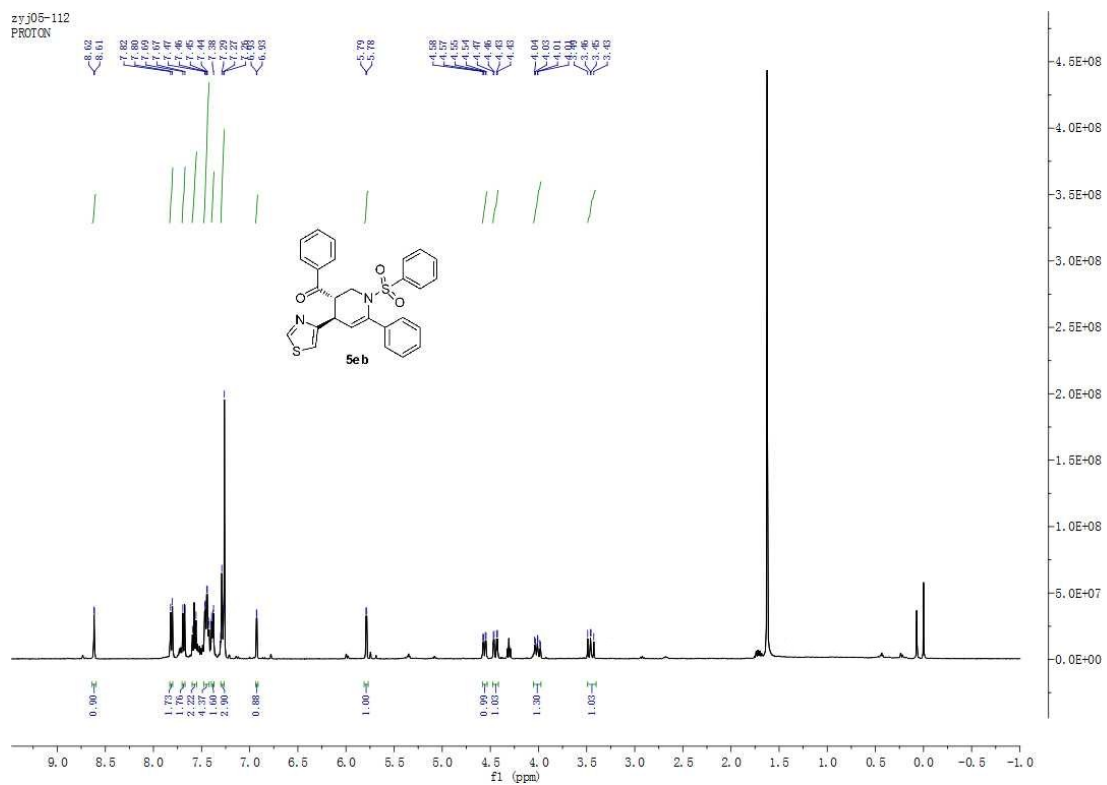


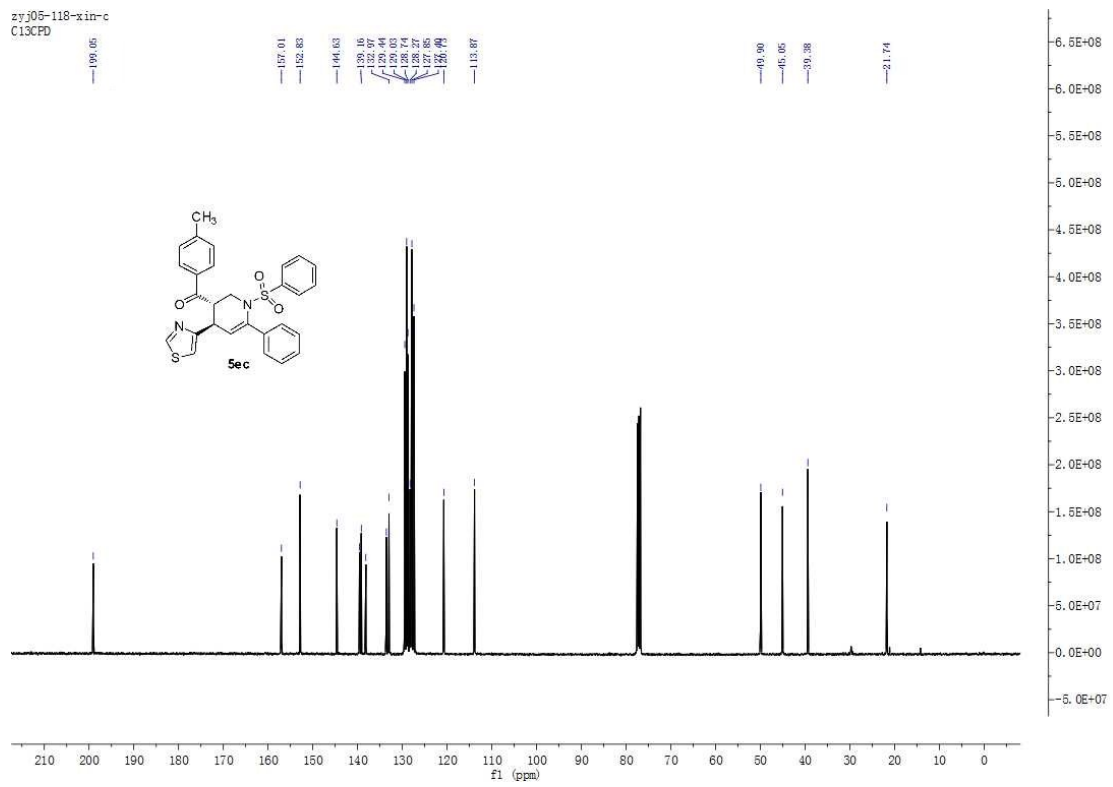
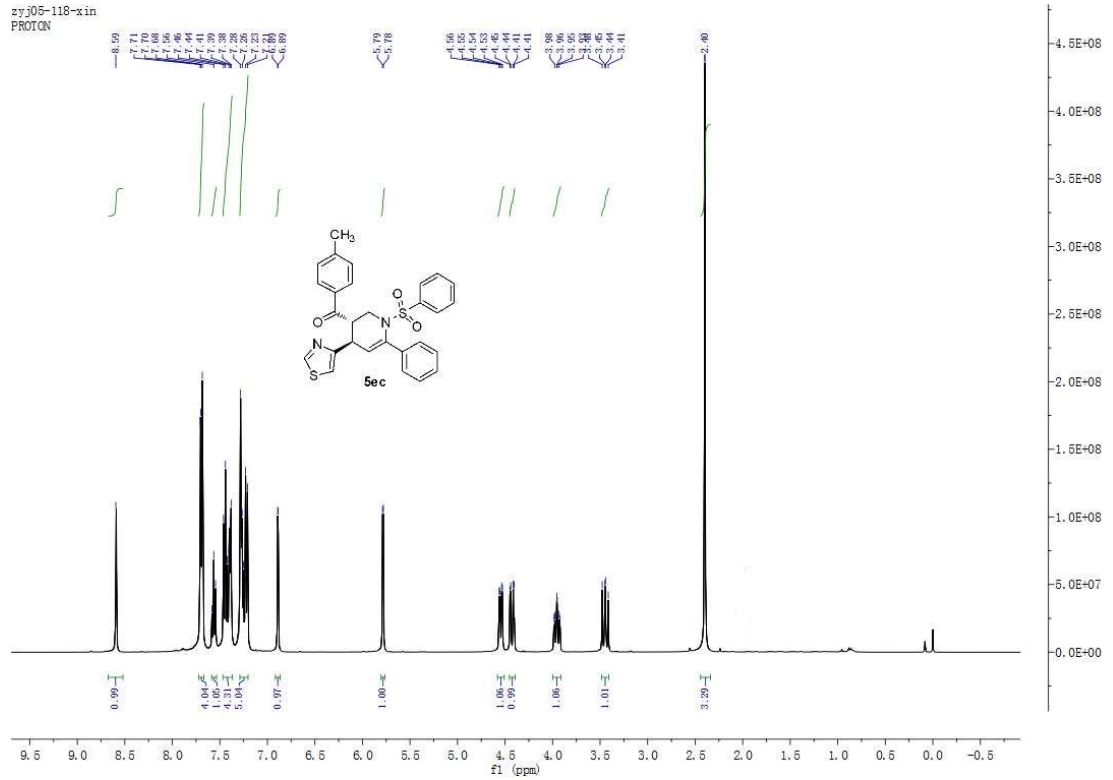
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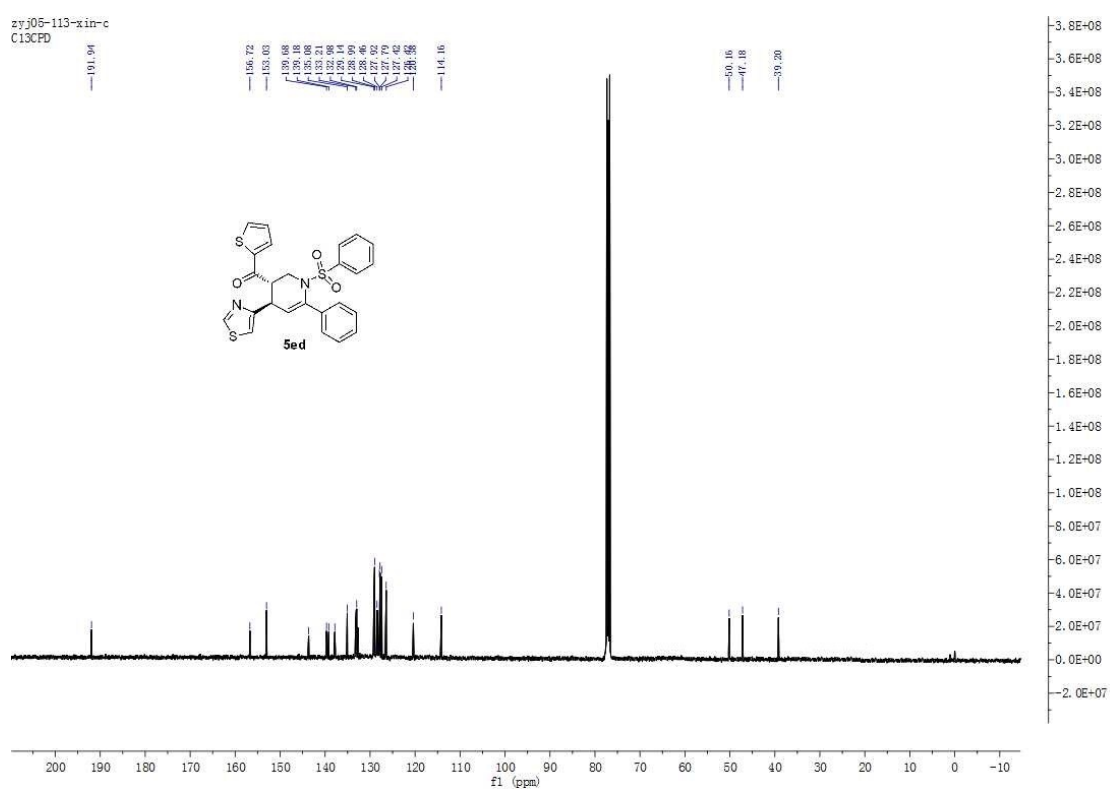
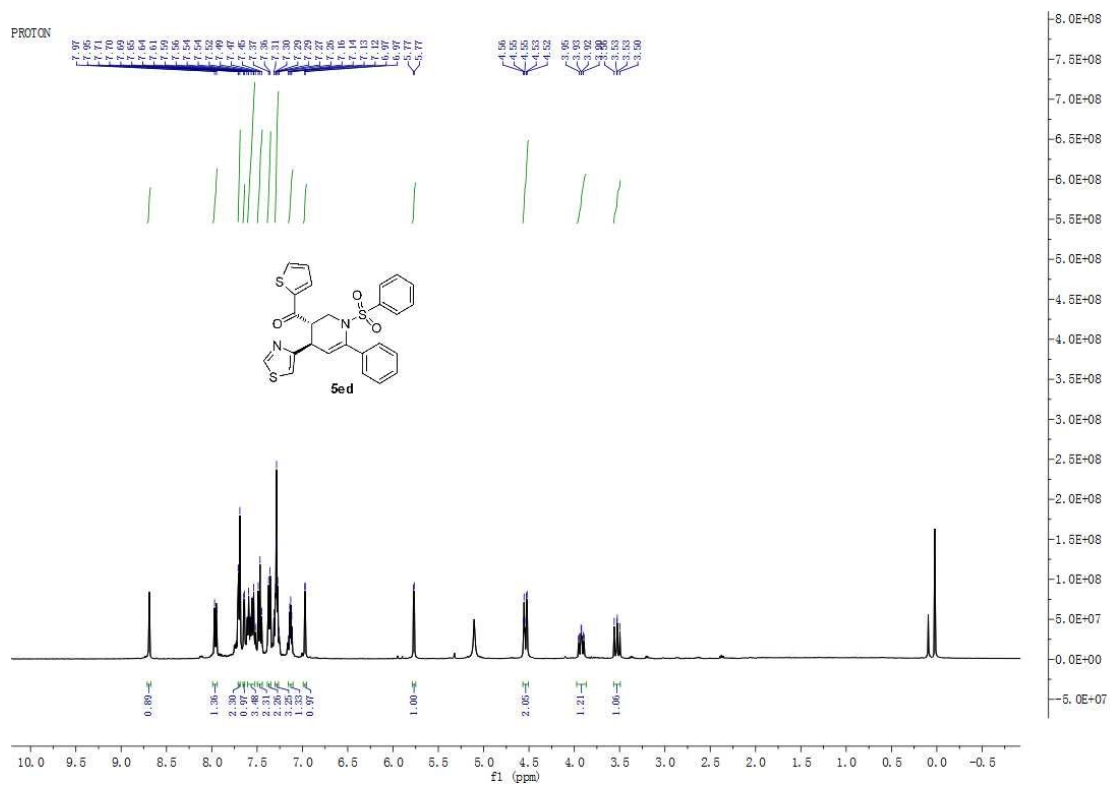




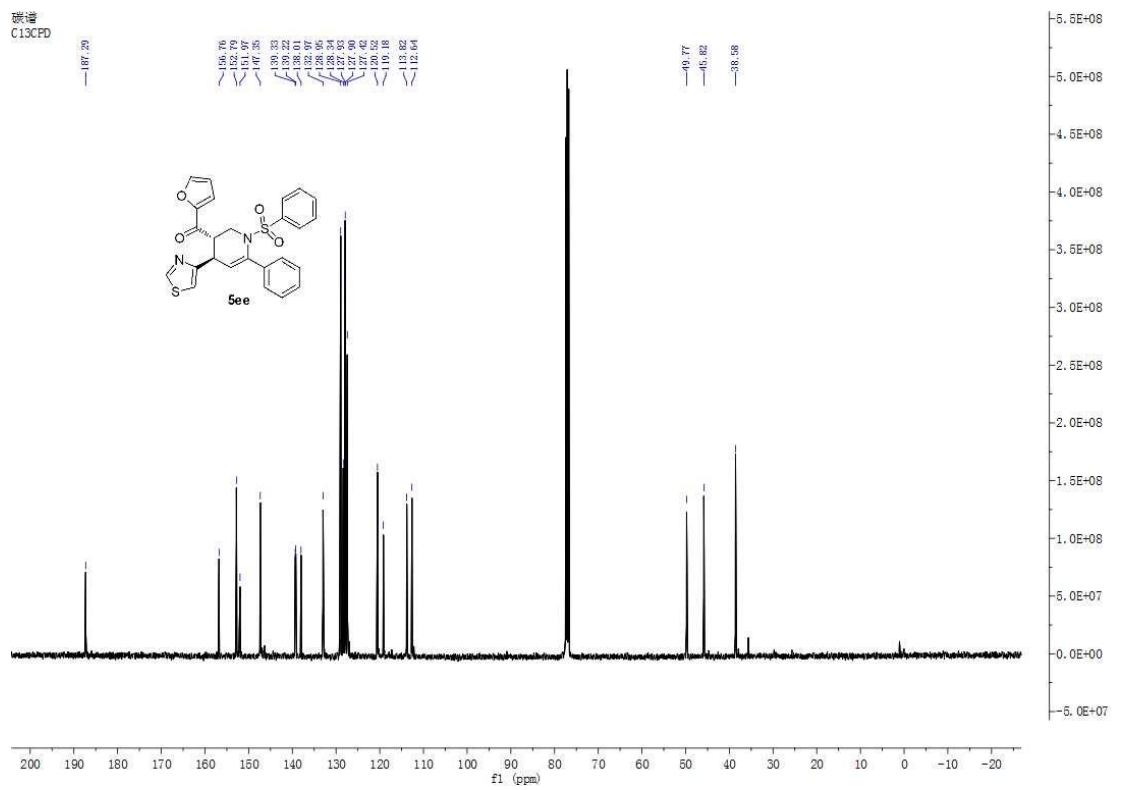
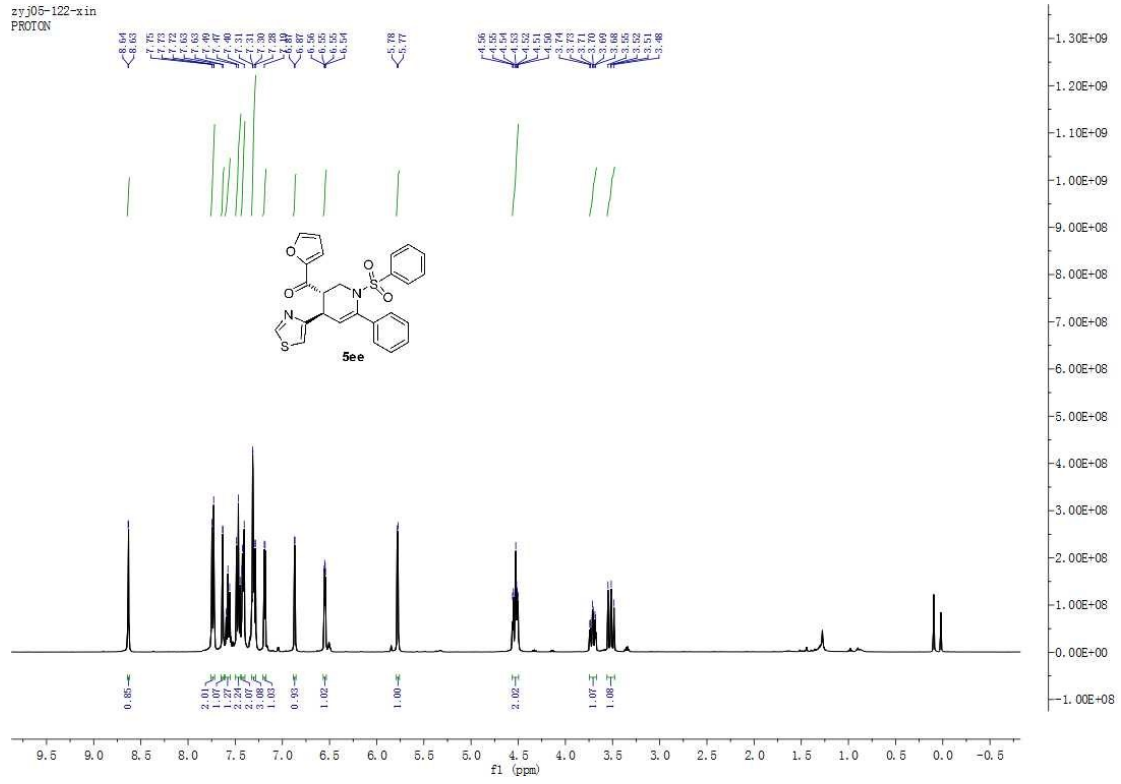


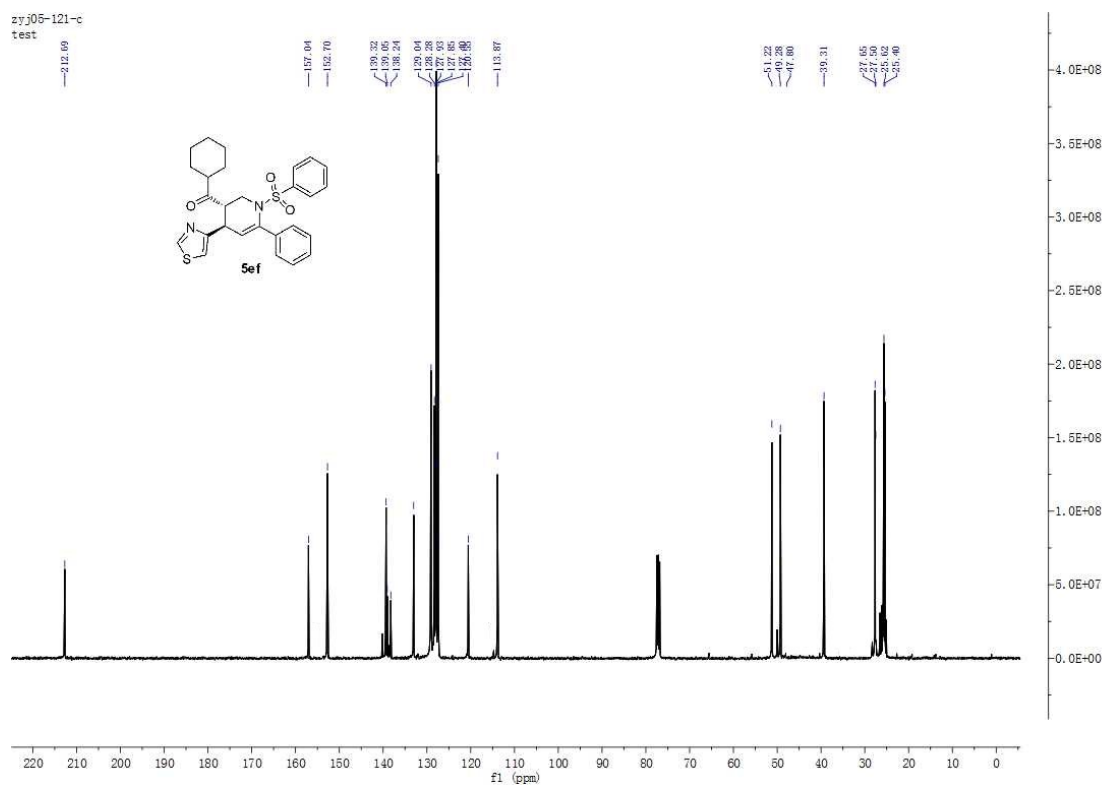
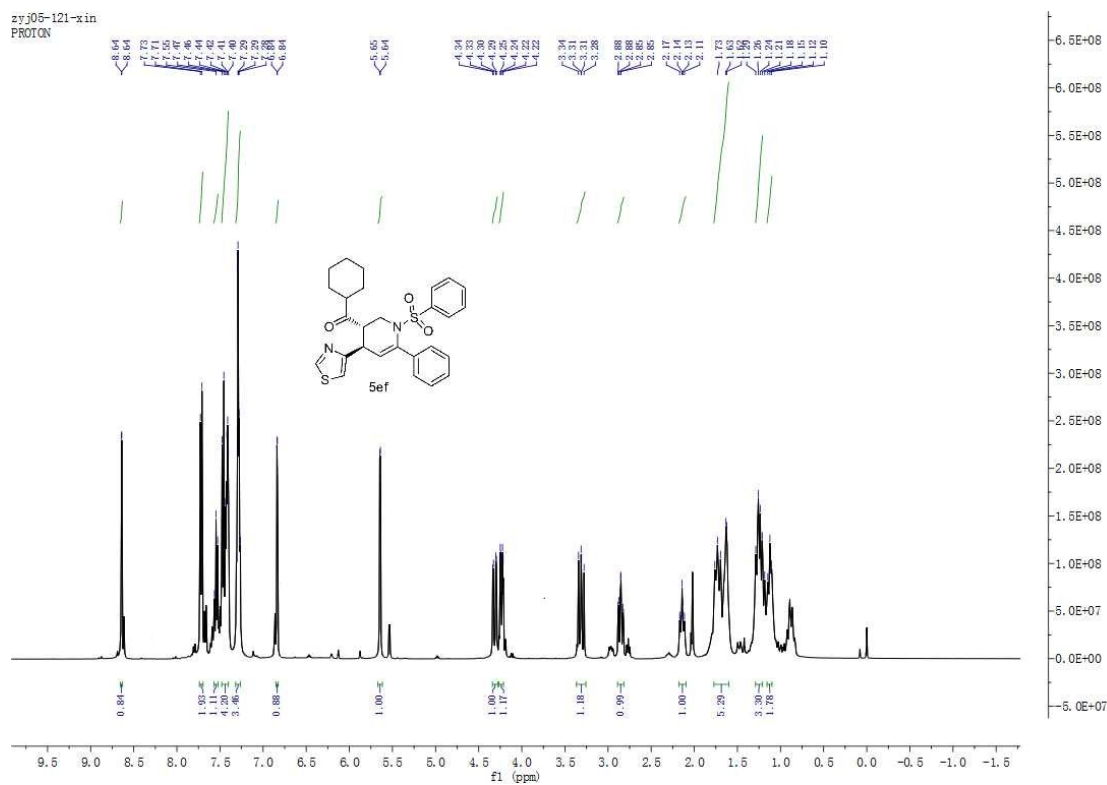




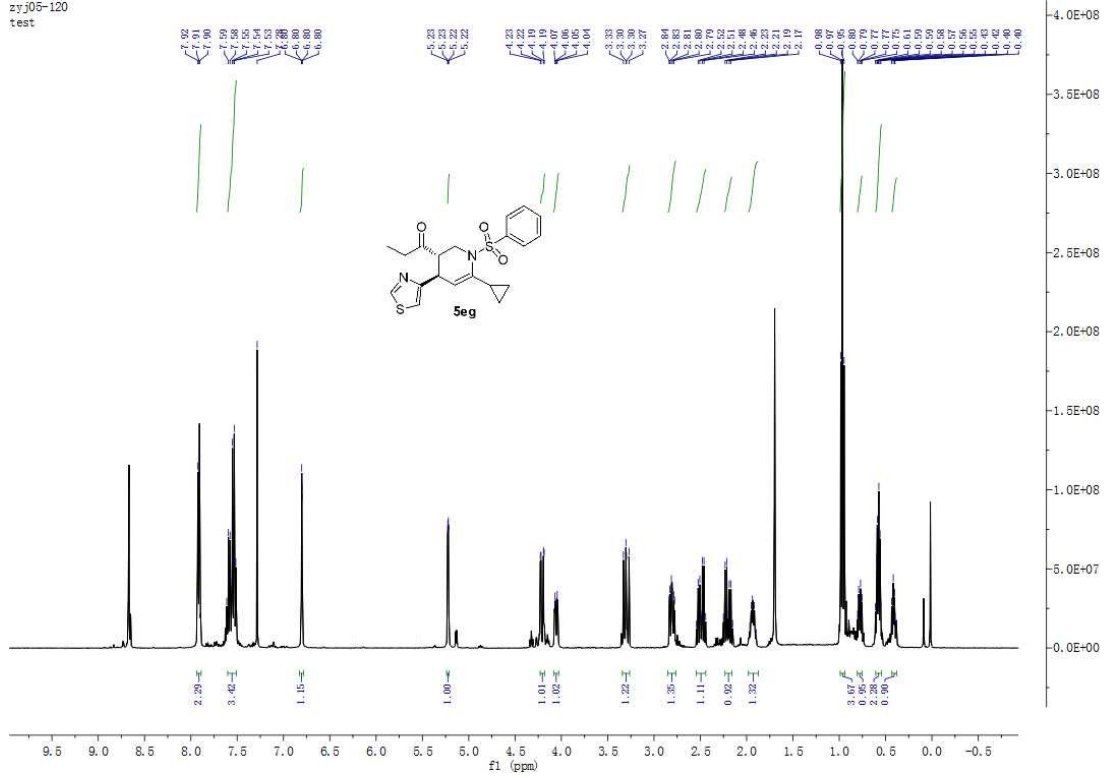


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zyj05-120  
test



zyj-05-120-c  
C13CPD

