

Supplementary Information for

**Electrochemical sulfonylation of enamides with sodium  
sulfinates to access  $\beta$ -amidovinyl sulfones**

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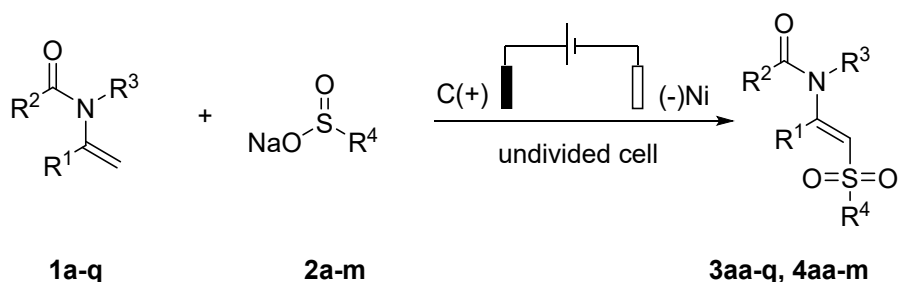
**List**

- 1. General information.....S1**
- 2. Preparation and characterizations of compounds 3aa-s, 4aa-m.....S1-18**
- 3. Procedure for cyclic voltammetry (CV).....S18**
- 4. References.....S19**
- 5. <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compounds.....S20-50**

## 1. General Information

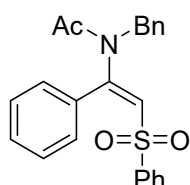
All  $^1\text{H}$  NMR (400 MHz) and  $^{13}\text{C}$  NMR (100 MHz) spectra were recorded in  $\text{CDCl}_3$ . TMS was used as an internal reference and  $J$  values are given in Hz. HR-MS were obtained on a Bruker micrOTOF-Q II spectrometer. PE is petroleum ether (60–90 °C). All enamides (**1a-e**)<sup>[1]</sup> and sodium sulfinates<sup>[2]</sup> are known compounds. They were purchased directly or were prepared according to the reported procedures. Unless otherwise noted, materials obtained from commercial suppliers were used without further purification.

## 2. Preparation and characterizations of compounds 3aa-q, 4aa-m



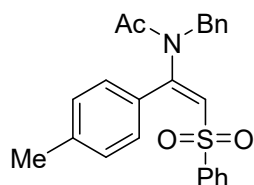
In 15 mL three-necked round bottom flask, with carbon plate anode (10 mm × 10 mm × 0.3 mm), nickel plate cathode (10 mm × 10 mm × 0.3 mm), a mixture of enamides (**1a-s**, 0.4 mmol), sodium sulfinates (**2a-m**, 1.2 mmol, 3 equiv.) in  $\text{CH}_3\text{CN}/\text{H}_2\text{O}$  (6 mL, 4:2) was stirred with constant current of 9 mA at room temperature for 4.5 h (monitored by TLC). After it was cooled down to room temperature, the mixture was poured into water (15 mL) and was extracted with EtOAc (3 x 15 mL). The combined organic

layers were washed with brine (2 x 15 mL) and dried over MgSO<sub>4</sub>. The solvent was removed by vacuum and the residue was purified by column chromatography (30% EtOAc in PE) to give the corresponding products **3aa-q**, **4aa-m**.



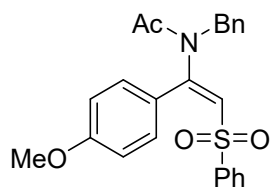
**(E)-N-benzyl-N-(1-phenyl-2-(phenylsulfonyl)vinyl)acetamide (3aa).**<sup>[3]</sup>

123mg (79%); Yellow solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.45-7.39 (m, 4H), 7.32-7.27 (m, 4H), 7.25-7.23 (m, 2H), 7.19-7.17 (m, 3H), 7.02-6.99 (m, 2H), 6.15 (s, 1H), 4.43 (s, 2H), 1.92 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 151.7, 140.7, 136.2, 133.3, 131.9, 131.3, 130.0, 128.9, 128.6, 128.5, 128.4, 128.3, 127.7, 127.2, 50.1, 22.1.



**(E)-N-benzyl-N-(2-(phenylsulfonyl)-1-(p-tolyl)vinyl)acetamide**

**(3ab).**<sup>[3]</sup> 115mg (71%); Yellow solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.56-7.51 (m, 3H), 7.40-7.36 (m, 2H), 7.26-7.23 (m, 5H), 7.21-7.19 (m, 2H), 7.09-7.07 (m, 2H), 6.13 (s, 1H), 4.50 (s, 2H), 2.41 (s, 3H), 1.97 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.1, 151.8, 142.0, 140.9, 136.3, 133.2, 130.1, 129.1, 129.0, 128.9, 128.6, 128.5, 127.7 (2C), 127.2, 50.2, 23.0, 21.5.



**(E)-N-benzyl-N-(1-(4-methoxyphenyl)-2-**

**(phenylsulfonyl)vinyl)acetamide (3ac).** 135mg (80%); White solid; m.p.

= 65-67 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.50-7.43 (m, 3H), 7.34-7.30

(m, 2H), 7.25-7.22 (m, 2H), 7.19-7.15 (m, 3H), 7.01-6.99 (m, 2H), 6.84-

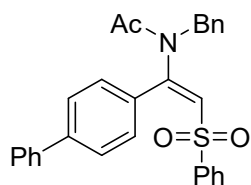
6.81 (m, 2H), 6.00 (s, 1H), 4.44 (s, 2H), 3.79 (s, 3H), 1.86 (s, 3H). <sup>13</sup>C

NMR (100 MHz, CDCl<sub>3</sub>) δ 170.2, 162.2, 151.6, 141.0, 136.4, 133.2,

131.9, 128.9, 128.6, 128.5, 127.7, 127.2, 126.9, 124.0, 113.8, 55.4, 50.3,

23.0. HRMS m/z: calcd for C<sub>24</sub>H<sub>24</sub>NO<sub>4</sub>S<sup>+</sup> [M+H]<sup>+</sup> 422.1421, found:

422.1423.



**(E)-N-(1-([1,1'-biphenyl]-4-yl)-2-(phenylsulfonyl)vinyl)-N-**

**benzylacetamide (3ad).**<sup>[3]</sup> 146mg (78%); Yellow viscous oil; <sup>1</sup>H NMR

(400MHz, CDCl<sub>3</sub>) δ 7.54-7.50 (m, 3H), 7.49-7.44 (m, 3H), 7.40-7.35 (m,

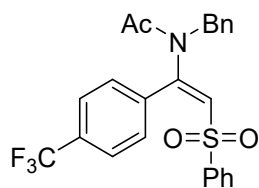
3H), 7.32-7.29 (m, 3H), 7.27-7.23 (m, 2H), 7.18-7.14 (m, 3H), 7.02-7.00

(m, 2H), 6.14 (s, 1H), 4.46 (s, 2H), 1.92 (s, 3H). <sup>13</sup>C NMR (100 MHz,

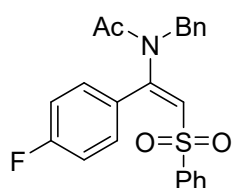
CDCl<sub>3</sub>) δ 170.0, 151.3, 144.0, 140.6, 139.6, 136.2, 133.2, 130.7, 130.5,

128.9, 128.8, 128.5, 128.42, 128.37, 128.1, 127.7, 127.2, 127.0, 126.8,

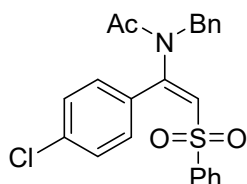
50.2, 23.0.



**(E)-N-benzyl-N-(2-(phenylsulfonyl)-1-(4-(trifluoromethyl)phenyl)vinyl)acetamide (3ae).**<sup>[3]</sup> 56mg (31%); Yellow solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.62 (d, *J* = 8.1 Hz, 2H), 7.57-7.51 (m, 3H), 7.42-7.38 (m, 4H), 7.28-7.26 (m, 3H), 7.07-7.05 (m, 2H), 6.33 (s, 1H), 4.52 (s, 2H), 2.03 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 169.9, 149.9, 140.4, 135.9, 135.7, 133.6, 132.8 (q, *J* = 33.0 Hz), 130.4, 129.8, 129.1, 128.8, 128.3, 128.0, 127.3, 125.2 (q, *J* = 4.0 Hz), 123.5 (q, *J* = 271.0 Hz), 50.3, 23.0.



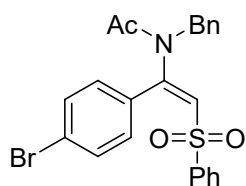
**(E)-N-benzyl-N-(1-(4-fluorophenyl)-2-(phenylsulfonyl)vinyl)acetamide (3af).**<sup>[3]</sup> 59mg (36%); Yellow solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.50-7.45 (m, 3H), 7.36-7.31 (m, 2H), 7.27-7.23 (m, 2H), 7.17-7.20 (m, 3H), 7.02-6.97 (m, 4H), 6.13 (s, 1H), 4.44 (s, 2H), 1.90 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 164.4 (d, *J* = 252 Hz), 150.6, 140.7, 136.1, 133.5, 132.3 (d, *J* = 9 Hz), 129.0, 128.7, 128.4 (2C), 128.0 (d, *J* = 4.0 Hz), 127.8, 127.2, 115.6 (d, *J* = 22.0 Hz), 50.3, 23.0.



**(E)-N-benzyl-N-(1-(4-chlorophenyl)-2-**

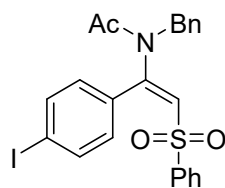
**(phenylsulfonyl)vinyl)acetamide (3ag).** 92mg (54%); White solid; m.p.

= 126-128 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.56-7.53 (m, 3H), 7.41 (t, J = 7.7 Hz, 2H), 7.36 (d, J = 8.3 Hz, 2H), 7.27-7.25 (m, 5H), 7.06-7.04 (m, 2H), 6.22 (s, 1H), 4.51 (s, 2H), 1.98 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 150.4, 140.58, 137.6, 136.0, 133.5, 131.4, 130.4, 129.1, 128.7, 128.6 (2C), 128.4, 127.8, 127.2, 50.2, 23.0. HRMS m/z: calcd for C<sub>23</sub>H<sub>21</sub>ClNO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 426.0925, found: 426.0925.



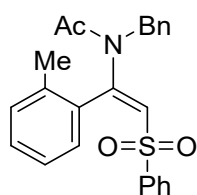
**(E)-N-benzyl-N-(1-(4-bromophenyl)-2-**

**(phenylsulfonyl)vinyl)acetamide (3ah).**<sup>[3]</sup> 111mg (59%); White solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.51-7.43 (m, 5H), 7.36-7.32 (m, 2H), 7.20-7.17 (m, 3H), 7.13-7.09 (m, 2H), 6.99-6.97 (m, 2H), 6.14 (s, 1H), 4.43 (s, 2H), 1.91 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 150.4, 140.6, 136.0, 133.5, 131.6, 131.5, 130.9, 129.1, 128.8, 128.7, 128.4, 127.9, 127.3, 126.1, 50.3, 23.0.



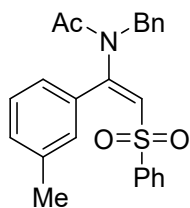
**(E)-N-benzyl-N-(1-(4-iodophenyl)-2-(phenylsulfonyl)vinyl)acetamide**

**(3ai)**. 157mg (76%); White solid; m.p. = 122-124 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.67-7.64 (m, 2H), 7.50-7.47 (m, 3H), 7.36-7.32 (m, 2H), 7.20-7.17 (m, 3H), 7.00-6.95 (m, 4H), 6.13 (s, 1H), 4.43 (s, 2H), 1.90 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 150.6, 140.6, 137.6, 136.0, 133.5, 131.5 (2C), 129.1, 128.7, 128.7, 128.4, 127.8, 127.3, 98.3, 50.2, 23.0. HRMS m/z: calcd for C<sub>23</sub>H<sub>21</sub>INO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 518.0281, found: 518.0281.



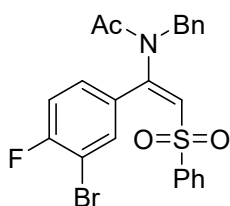
**(E)-N-benzyl-N-(2-(phenylsulfonyl)-1-(o-tolyl)vinyl)acetamide(3aj)**.

126mg (78%); Yellow viscous oil; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.53-7.49 (m, 1H), 7.45-7.43 (m, 2H), 7.36-7.32 (m, 3H), 7.29-7.23 (m, 3H), 7.21-7.17 (m, 1H), 7.12-7.10 (m, 1H), 7.07-7.05 (m, 1H), 7.02-6.99 (m, 2H), 6.53 (s, 1H), 4.45 (s, 2H), 2.17 (s, 3H), 1.85 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.5, 152.4, 141.1, 137.2, 136.5, 133.1, 132.3, 130.9, 130.8, 130.5, 128.8, 128.6, 127.5, 127.4, 127.3, 127.1, 125.5, 49.9, 23.5, 19.4. HRMS m/z: calcd for C<sub>24</sub>H<sub>24</sub>NO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 406.1471, found: 406.1473.



**(E)-N-benzyl-N-(2-(phenylsulfonyl)-1-(*m*-tolyl)vinyl)acetamide (3ak).**

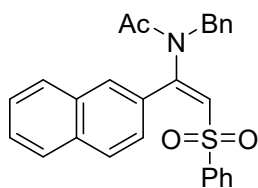
112mg (69%); Yellow solid; m.p. = 115-117 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.45-7.41 (m, 3H), 7.30-7.26 (m, 2H), 7.21-7.16 (m, 5H), 7.09-7.06 (m, 1H), 7.02-6.99 (m, 2H), 6.92 (d, *J* = 2.2 Hz, 1H), 6.14 (s, 1H), 4.42 (s, 2H), 2.24 (s, 3H), 1.94 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 151.1, 140.8, 138.1, 136.3, 133.2, 132.1, 131.9, 130.1, 128.8, 128.5, 128.4, 128.3, 128.2, 127.7, 127.5, 127.2, 50.2, 23.0, 21.2. HRMS *m/z*: calcd for C<sub>24</sub>H<sub>24</sub>NO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 406.1471, found: 406.1471.



**(E)-N-benzyl-N-(1-(3-bromo-4-fluorophenyl)-2-**

**(phenylsulfonyl)vinyl)acetamide (3al).** 92mg (47%); White solid; m.p. = 105-107 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.52-7.48 (m, 3H), 7.38-7.33 (m, 2H), 7.27 – 7.22 (m, 2H), 7.20-7.18 (m, 3H), 7.06 (t, *J* = 8.2 Hz, 1H), 6.98-6.96 (m, 2H), 6.19 (s, 1H), 4.45 (s, 2H), 1.94 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 169.9, 160.6 (d, *J* = 252 Hz), 149.1, 140.4, 135.7, 134.6, 133.6, 131.5 (d, *J* = 8 Hz), 129.5 (d, *J* = 4 Hz), 129.3, 129.1, 128.7, 128.3, 128.0, 127.3, 116.4 (d, *J* = 23 Hz), 109.3 (d, *J* = 21 Hz), 50.4, 23.0. HRMS *m/z*: calcd for C<sub>23</sub>H<sub>20</sub>BrFNO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 488.0326, found: 488.0325.

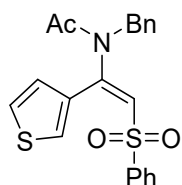




**(E)-N-benzyl-N-(1-(naphthalen-2-yl)-2-**

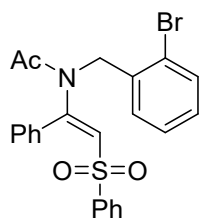
**(phenylsulfonyl)vinyl)acetamide (3am).**<sup>[4]</sup> 102mg (58%); Yellow solid;

<sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.88-7.79 (m, 4H), 7.62-7.54 (m, 2H), 7.50 -7.43 (m, 3H), 7.29-7.25 (m, 6H), 7.12-7.08 (m, 2H), 6.32 (s, 1H), 4.54 (s, 2H), 2.06 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 151.8, 140.8, 136.3, 134.4, 133.2, 132.3, 131.4, 129.2, 128.82, 128.80, 128.7, 128.6, 128.5, 128.2, 128.0, 127.8, 127.7, 127.3, 127.0, 125.5, 50.3, 23.1.



**(E)-N-benzyl-N-(2-(phenylsulfonyl)-1-(thiophen-3-yl)vinyl)acetamide**

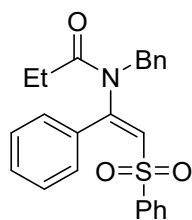
**(3an).** 113mg (71%); Yellow solid; m.p. = 58-60 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.70-7.69 (m, 1H), 7.56-7.50 (m, 3H), 7.40-7.36 (m, 2H), 7.29-7.23 (m, 4H), 7.12-7.09 (m, 2H), 6.98-6.97 (m, 1H), 6.20 (s, 1H), 4.58 (s, 2H), 1.94 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 169.9, 146.3, 140.6, 136.2, 133.3, 133.1, 131.6, 128.8, 128.6, 128.5, 128.4, 127.8, 127.7, 127.1, 126.3, 50.6, 22.8. HRMS m/z: calcd for C<sub>21</sub>H<sub>20</sub>NO<sub>3</sub>S<sub>2</sub><sup>+</sup> [M+H]<sup>+</sup> 398.0879, found: 398.0879.



**(E)-N-(2-bromobenzyl)-N-(1-phenyl-2-**

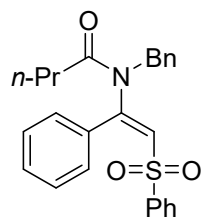
**(phenylsulfonyl)vinyl)acetamide (3ao).** <sup>[4]</sup> 158mg (84%); Yellow solid;

<sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.45-7.35 (m, 5H), 7.26 (t, *J* = 7.7 Hz, 4H), 7.18-7.11 (m, 3H), 7.03-6.99 (m, 1H), 6.97-6.95 (m, 1H), 6.36 (s, 1H), 4.58 (s, 2H), 1.96 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.1, 151.7, 140.5, 134.9, 133.2, 132.8, 131.6, 131.2, 129.9, 129.7, 129.1, 128.8, 128.3, 128.2, 127.4, 127.1, 123.1, 50.3, 22.9.



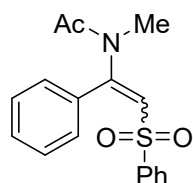
**(E)-N-benzyl-N-(1-phenyl-2-(phenylsulfonyl)vinyl)propionamide**

**(3ap).** 133mg (82%); White solid; m.p. = 95-97 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.54-7.46 (m, 4H), 7.40-7.34 (m, 4H), 7.32 (d, *J* = 7.2 Hz, 2H), 7.26-7.25 (m, 3H), 7.10-7.07 (m, 2H), 6.21 (s, 1H), 4.51 (s, 2H), 2.20 (q, *J* = 7.4 Hz, 2H), 1.02 (t, *J* = 7.4 Hz, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 173.9, 151.6, 140.8, 136.4, 133.2, 132.1, 131.3, 130.1, 128.9, 128.6, 128.4, 128.3, 128.1, 127.7, 127.2, 50.4, 28.3, 9.9. HRMS *m/z*: calcd for C<sub>24</sub>H<sub>24</sub>NO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 406.1471, found: 406.1475.



**(E)-N-benzyl-N-(1-phenyl-2-(phenylsulfonyl)vinyl)butyramide (3aq).**

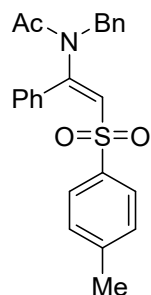
139mg (83%); White solid; m.p. = 77-79 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.54-7.47 (m, 4H), 7.41-7.35 (m, 4H), 7.34-7.32 (m, 2H), 7.27-7.23 (m, 3H), 7.09-7.07 (m, 2H), 6.18 (s, 1H), 4.49 (s, 2H), 2.16 (t, *J*=15.0Hz, 2H), 1.57 (m, 2H), 0.79 (t, *J* = 14.8 Hz, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 172.9, 151.5, 140.8, 136.4, 133.3, 132.0, 131.3, 130.1, 128.9, 128.6, 128.4, 128.3, 128.2, 127.6, 127.2, 50.2, 36.8, 19.1, 13.7. HRMS *m/z*: calcd for C<sub>25</sub>H<sub>26</sub>NO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 420.1628, found: 420.1629.



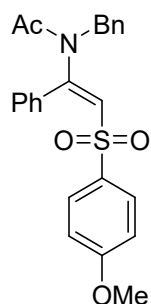
**(E)-N-methyl-N-(1-phenyl-2-(phenylsulfonyl)vinyl)acetamide (3ar).**

67 mg (53%, *E/Z* = 3.3:1); Colorless viscous oil; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.98-7.96 (m, 0.6H, ArH of (*Z*)-isomer), 7.68-7.61 (m, 2.6H, ArH +0.6 H ArH of (*Z*)-isomer), 7.57-7.46 (m, 2.6H, ArH +0.6 H ArH of (*Z*)-isomer), 7.44-7.37 (m, 7.2H, ArH +1.2 H ArH of (*Z*)-isomer), 6.97 (s, 0.3H, C=CH of (*Z*)-isomer), 6.44 (s, 1H), 2.90 (s, 3H), 2.89 (s, 0.9H, -NCH<sub>3</sub> of (*Z*)-isomer), 1.99 (s, 3H), 1.77 (s, 0.9H, -COCH<sub>3</sub> of (*Z*)-isomer). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ (*E*)-isomer:170.2, 153.1, 140.7, 133.3, 132.0, 131.2, 129.8, 128.9, 128.3, 127.2, 126.5, 35.4, 22.8. (*Z*)-isomer:

170.2, 151.3, 140.4, 133.9, 133.1, 131.9, 129.4, 129.37, 127.9, 126.8, 126.3, 35.7, 21.4. HRMS  $m/z$ : calcd for  $C_{17}H_{18}NO_3S^+$   $[M+H]^+$  316.1002, found: 316.1003.

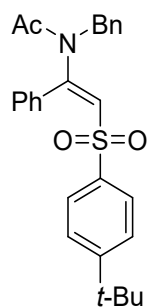


**(E)-N-benzyl-N-(1-phenyl-2-tosylvinyl)acetamide (4aa).** <sup>[3]</sup> 115mg (71%); White solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>)  $\delta$  7.44 -7.40 (m, 1H), 7.35-7.30 (m, 4H), 7.28-7.25 (m, 2H), 7.19-7.18 (m, 3H), 7.09 (d,  $J = 8.2$  Hz, 2H), 7.02-6.99 (m, 2H), 6.12 (s, 1H), 4.41 (s, 2H), 2.31 (s, 3H), 1.93 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  170.0, 151.3, 144.3, 137.8, 136.3, 132.0, 131.3, 130.1, 129.6, 128.9, 128.6, 128.5, 128.3, 127.7, 127.3, 50.1, 23.0, 21.5.



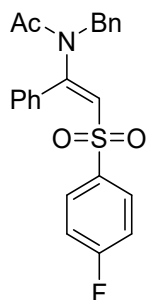
**(E)-N-benzyl-N-(2-((4-methoxyphenyl)sulfonyl)-1-phenylvinyl)acetamide (4ab).** <sup>[3]</sup> 118mg (70%); White solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>)  $\delta$  7.51-7.47 (m, 1H), 7.45-7.43 (m, 2H), 7.40 (t,  $J = 7.7$  Hz, 2H), 7.35-7.32 (m, 2H), 7.27-7.25 (m, 3H), 7.10-7.08 (m, 2H), 6.83-

6.81 (m, 2H), 6.21 (s, 1H), 4.49 (s, 2H), 3.83 (s, 3H), 2.01 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  170.0, 163.4, 150.8, 136.3, 132.3, 132.0, 131.2, 130.1, 129.5, 129.4, 128.6, 128.5, 128.3, 127.7, 114.1, 55.6, 50.0, 23.0.



**(E)-N-benzyl-N-(2-((4-tert-butyl)phenyl)sulfonyl)-1-**

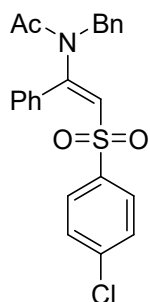
**phenylvinyl)acetamide (4ac).**<sup>[3]</sup> 107mg (60%); Yellow viscous oil;  $^1\text{H}$  NMR (400MHz,  $\text{CDCl}_3$ )  $\delta$  7.40-7.35 (m, 3H), 7.30-7.26 (m, 4H), 7.25-7.22 (m, 2H), 7.18-7.14 (m, 3H), 7.01-6.99 (m, 2H), 6.14 (s, 1H), 4.42 (s, 2H), 1.93 (s, 3H), 1.21 (s, 9H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  170.0, 157.2, 151.0, 137.4, 136.2, 132.0, 131.1, 130.0, 129.0, 128.5, 128.4, 128.2, 127.6, 127.1, 125.8, 50.1, 35.0, 30.8, 22.9.



**(E)-N-benzyl-N-(2-((4-fluorophenyl)sulfonyl)-1-**

**phenylvinyl)acetamide (4ad).**<sup>[3]</sup> 72mg (44%); Yellow solid;  $^1\text{H}$  NMR (400MHz,  $\text{CDCl}_3$ )  $\delta$  7.51-7.45 (m, 3H), 7.40-7.36 (m, 2H), 7.30-7.25 (m,

5H), 7.10-7.08 (m, 2H), 7.02-6.98 (m, 2H), 6.26 (s, 1H), 4.53 (s, 2H), 2.01 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 165.3 (d, *J* = 255.0 Hz), 151.9, 136.8 (d, *J* = 4.0 Hz), 136.2, 132.0, 131.3, 130.1 (d, *J* = 10 Hz), 128.6, 128.4, 128.3, 128.3, 127.7, 116.1 (d, *J* = 23 Hz), 50.2, 23.1.



**(*E*)-*N*-benzyl-*N*-(2-((4-chlorophenyl)sulfonyl)-1-**

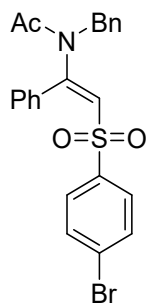
**phenylvinyl)acetamide (4ae).** 126mg (74%); White solid; m.p. = 112-

114 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.45-7.40 (m, 1H), 7.33-7.29 (m, 4H), 7.24-7.19 (m, 7H), 7.02-7.00 (m, 2H), 6.17 (s, 1H), 4.46 (s, 2H),

1.94 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.1, 152.2, 139.9, 139.3, 136.2, 132.0, 131.4, 130.0, 129.1, 128.73, 128.67, 128.4, 128.3, 128.0,

127.8, 50.4, 23.2. HRMS *m/z*: calcd for C<sub>23</sub>H<sub>21</sub>ClNO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup>

426.0925, found: 426.0925.

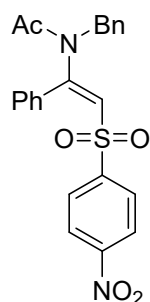


**(E)-N-benzyl-N-(2-((4-bromophenyl)sulfonyl)-1-**

**phenylvinyl)acetamide (4af).**<sup>[3]</sup> 98mg (52%); Brown viscous oil; <sup>1</sup>H

**NMR (400MHz, CDCl<sub>3</sub>)** δ 7.44-7.38 (m, 3H), 7.33-7.29 (m, 2H), 7.25-7.19 (m, 7H), 7.02-7.00 (m, 2H), 6.17 (s, 1H), 4.46 (s, 2H), 1.94 (s, 3H).

**<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 170.1, 152.3, 139.8, 136.2, 132.1, 132.0, 131.4, 130.0, 128.8, 128.7, 128.5, 128.4, 128.3, 127.83, 127.78, 50.4, 23.2.



**(E)-N-benzyl-N-(2-((4-nitrophenyl)sulfonyl)-1-phenylvinyl)acetamide**

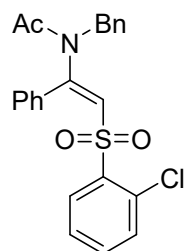
**(4ag).**<sup>[3]</sup> 63mg (36%); Yellow solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 8.12-

8.10 (m, 2H), 7.57-7.53 (m, 2H), 7.52-7.47 (m, 1H), 7.38-7.34 (m, 2H), 7.31-7.29 (m, 3H), 7.25-7.22 (m, 2H), 7.12-7.09 (m, 2H), 6.36 (s, 1H),

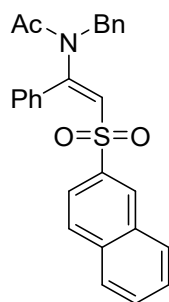
4.59 (s, 2H), 2.01 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 170.4, 153.6,

150.0, 146.4, 136.0, 132.0, 131.6, 130.0, 128.8, 128.6, 128.5, 128.1,

127.9, 126.2, 123.8, 50.7, 23.5.

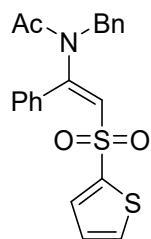


**(E)-N-benzyl-N-(2-((2-chlorophenyl)sulfonyl)-1-phenylvinyl)acetamide (4ah).**<sup>[3]</sup> 92mg (54%); Yellow solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.59-7.56 (m, 1H), 7.37-7.31 (m, 3H), 7.24-7.14 (m, 8H), 7.05-6.99 (m, 2H), 6.40 (s, 1H), 4.56 (s, 2H), 2.04 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.4, 153.4, 138.4, 136.4, 134.3, 132.3, 132.1, 131.4, 131.1, 130.6, 129.7, 128.6, 128.2, 127.9, 127.6, 127.0, 126.0, 50.9, 23.4.



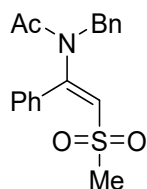
**(E)-N-benzyl-N-(2-(naphthalen-2-ylsulfonyl)-1-phenylvinyl)acetamide (4ai).**<sup>[3]</sup> 90mg (51%); Yellow viscous oil; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.98 (s, 1H), 7.87-7.82 (m, 2H), 7.78-7.76 (m, 1H), 7.65-7.61 (m, 1H), 7.59-7.55 (m, 1H), 7.52-7.51 (m, 1H), 7.46-7.42 (m, 1H), 7.35-7.28 (m, 4H), 7.24-7.20 (m, 3H), 7.08-7.05 (m, 2H), 6.31 (s, 1H), 4.50 (s, 2H), 1.99 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.1, 151.9, 137.3, 136.2, 134.9, 132.0, 131.8, 131.3, 130.1, 129.3, 129.25, 129.22, 129.20, 128.6, 128.6, 128.4, 128.2, 127.8, 127.7, 127.6, 121.9, 50.2, 23.1.





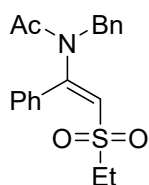
**(E)-N-benzyl-N-(1-phenyl-2-(thiophen-2-ylsulfonyl)vinyl)acetamide**

**(4aj)**. 68mg (43%); Yellow viscous oil;  $^1\text{H NMR}$  (400MHz,  $\text{CDCl}_3$ )  $\delta$  7.59-7.57 (m, 1H), 7.53-7.49 (m, 1H), 7.44-7.36 (m, 4H), 7.27-7.24 (m, 4H), 7.11-7.08 (m, 2H), 6.97-6.94 (m, 1H), 6.28 (s, 1H), 4.51 (s, 2H), 2.06 (s, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  170.1, 151.8, 142.0, 136.2, 133.8, 133.7, 131.8, 131.5, 130.1, 128.7, 128.6, 128.43, 128.39, 127.7, 127.5, 50.2, 22.9. HRMS m/z: calcd for  $\text{C}_{21}\text{H}_{20}\text{NO}_3\text{S}_2^+$   $[\text{M}+\text{H}]^+$  398.0879, found: 398.0879.



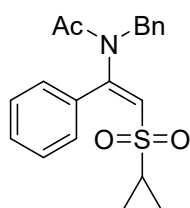
**(E)-N-benzyl-N-(2-(methylsulfonyl)-1-phenylvinyl)acetamide (4ak)**

64mg (49%); White solid; m.p. = 127-129 °C;  $^1\text{H NMR}$  (400MHz,  $\text{CDCl}_3$ )  $\delta$  7.55-7.50 (m, 1H), 7.49-7.43 (m, 4H), 7.33-7.27 (m, 3H), 7.17-7.15 (m, 2H), 6.22 (s, 1H), 4.61 (s, 2H), 2.66 (s, 3H), 2.19 (s, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  170.1, 151.8, 136.2, 132.0, 131.6, 129.7, 128.63, 128.60, 128.3, 127.8, 127.4, 50.3, 43.2, 23.1. HRMS m/z: calcd for  $\text{C}_{18}\text{H}_{20}\text{NO}_3\text{S}^+$   $[\text{M}+\text{H}]^+$  330.1158, found: 330.1157.



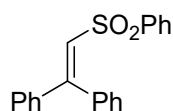
**(E)-N-benzyl-N-(2-(ethylsulfonyl)-1-phenylvinyl)acetamide (4al).**

85mg (62%); White solid; m.p. = 70-72 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.46-7.35 (m, 5H), 7.26-7.19 (m, 3H), 7.10-7.08 (m, 2H), 6.04 (s, 1H), 4.53 (s, 2H), 2.68 (q, *J* = 7.4 Hz, 2H), 2.14 (s, 3H), 1.10 (t, *J* = 7.4 Hz, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.2, 152.2, 136.3, 132.1, 131.4, 129.7, 128.7, 128.5, 128.2, 127.8, 125.4, 50.5, 49.6, 23.1, 6.6. HRMS m/z: calcd for C<sub>19</sub>H<sub>22</sub>NO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 344.1315, found: 344.1317.



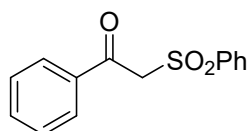
**(E)-N-benzyl-N-(2-(cyclopropylsulfonyl)-1-phenylvinyl)acetamide**

**(4am).** 67mg (47%); White solid; m.p. = 88-90 °C; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.53-7.49 (m, 3H), 7.46-7.42 (m, 2H), 7.33-7.26 (m, 3H), 7.18-7.16 (m, 2H), 6.22 (s, 1H), 4.58 (s, 2H), 2.24 (s, 3H), 2.15 (*tt*, *J* = 8.0, 4.8 Hz, 1H), 1.06 (*dt*, *J* = 5.1, 2.5 Hz, 2H), 0.86 (*dtd*, *J* = 8.3, 6.3, 5.2, 2.8 Hz, 2H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 170.0, 151.1, 136.3, 132.2, 131.4, 129.8, 128.6, 128.4, 128.4, 127.7, 127.4, 50.1, 31.7, 23.0, 5.0. HRMS m/z: calcd for C<sub>20</sub>H<sub>22</sub>NO<sub>3</sub>S<sup>+</sup> [M+H]<sup>+</sup> 356.1315, found: 356.1315.



**(2-(phenylsulfonyl)ethene-1,1-diyl)dibenzene (6).**<sup>[5]</sup> 125mg (26%);

White solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.60-7.56 (m, 2H), 7.50-7.45 (m, 1H), 7.37-7.26 (m, 8H), 7.22-7.18 (m, 2H), 7.09-7.05 (m, 2H), 7.03 (s, 1H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 155.2, 141.3, 139.0, 135.4, 132.8, 130.3, 129.7, 128.8, 128.6, 128.6, 128.5, 128.1, 127.8, 127.5.



**1-phenyl-2-(phenylsulfonyl)ethan-1-one (7).**<sup>[4]</sup> 16 mg (15%); White solid; <sup>1</sup>H NMR (400MHz, CDCl<sub>3</sub>) δ 7.96-7.87 (m, 4H), 7.68-7.59 (m, 2H), 7.56-7.52 (m, 2H), 7.49-7.45 (m, 2H), 4.75 (s, 2H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 187.9, 138.6, 135.6, 134.3, 134.2, 129.2, 129.1, 128.8, 128.5, 63.3.

### 3. Procedure for cyclic voltammetry (CV):

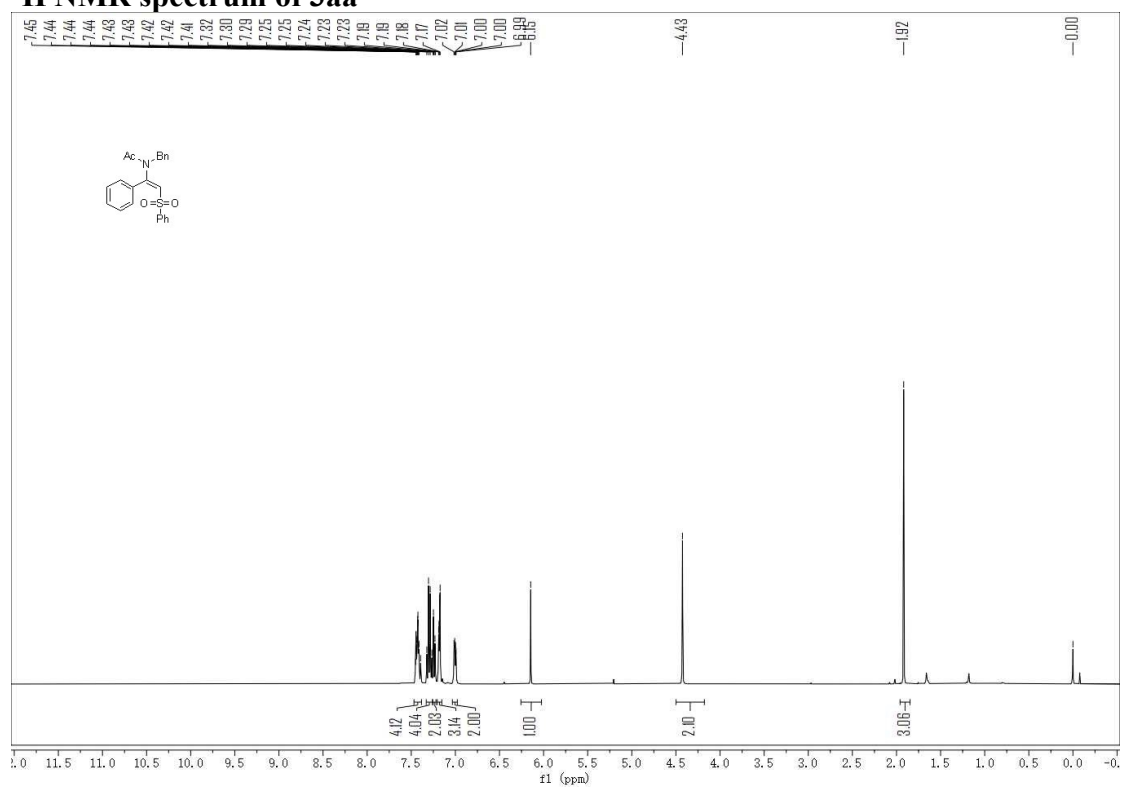
Cyclic voltammetry was performed in a three-electrode cell at room temperature. The working electrode was a steady glassy carbon disk electrode while the counter electrode was a platinum wire. The reference was an Ag/AgCl electrode submerged in saturated aqueous KCl solution. A mixed solvent (MeCN/H<sub>2</sub>O = 2/1, 6 mL) containing relative compounds (0.1 mmol) was poured into the electrochemical cell in cyclic voltammetry experiments. The scan rate was 0.10 V/s, ranging from 0 V to 2.5 V.

### 3. Reference

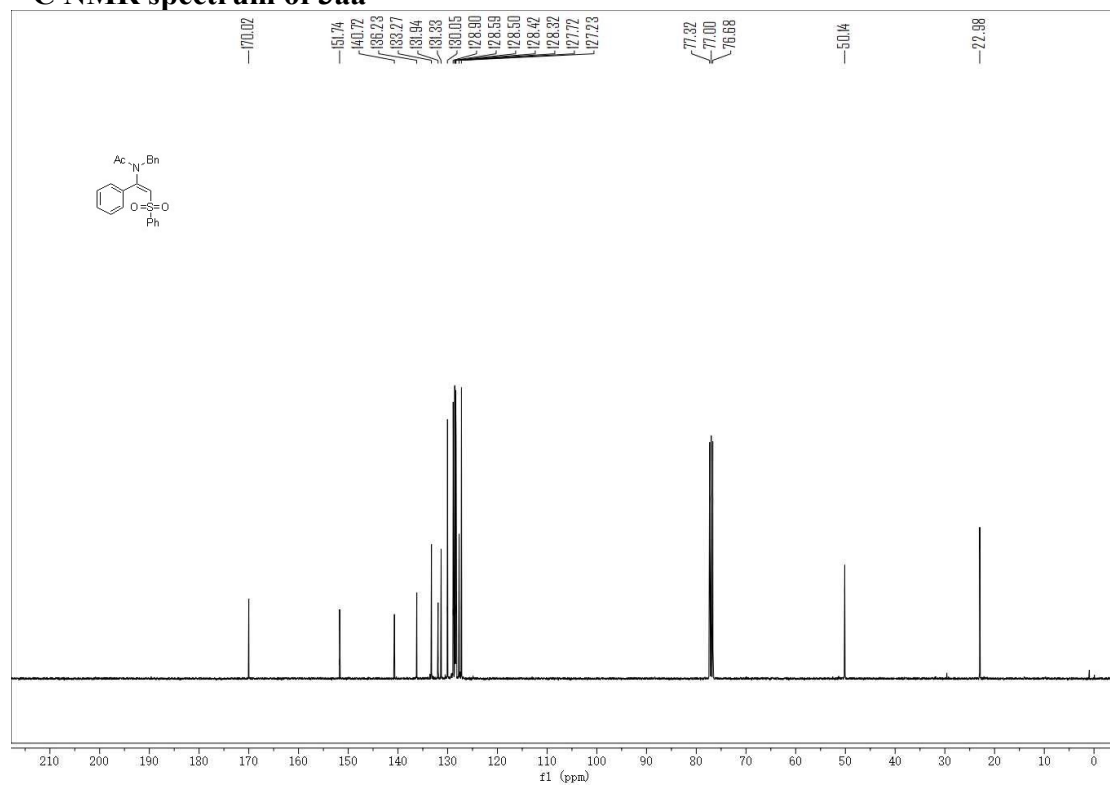
- [1]. (a) M. Van den Berg, R. M. Haak, A. J. Minnaard, A. H. M. de Vries, J. G. de Vries and B. L. Feringa, *Adv. Synth. Catal.*, 2002, **344**, 1003-1007; (b) S. Pankajakshan, Y.-H. Xu, J. K. Cheng, M. T. Low and T.-P. Loh, *Angew. Chem. Int. Ed.*, 2012, **51**, 5701-5705; (c) Z.-Y. Shen, J.-K. Cheng, C. Wang, C. Yuan, T.-P. Loh and X.-H. Hu, *ACS Catal.*, 2019, **9**, 8128–8135.
- [2]. M. Jiang, Y. Yuan, T. Wang, Y. Xiong, J. Li, H. Guo and A. Lei, *Chem. Commun.*, 2019, **55**, 13852-13855;
- [3]. T.-H. Zhu, X.-C. Zhang, X.-L. Cui, Z.-Y. Zhang, H. Jiang, S.-S. Sun, L.-L. Zhao, K. Zhao and T.-P. Loh, *Adv. Synth. Catal.*, 2019, **361**, 3593-3598;
- [4]. T.-H. Zhu, X.-C. Zhang, K. Zhao and T.-P. Loh, *Org. Chem. Front.*, 2019, **6**, 94-98;
- [5]. G. Zhang, J.-G. Fu, Q. Zhao, G.-S. Zhang, M.-Y. Li, C.-G. Feng and G.-Q. Lin, *Chem. Commun.*, 2020, **56**, 4688-4691.

## 4. <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compounds 3aa-q, 4aa-m

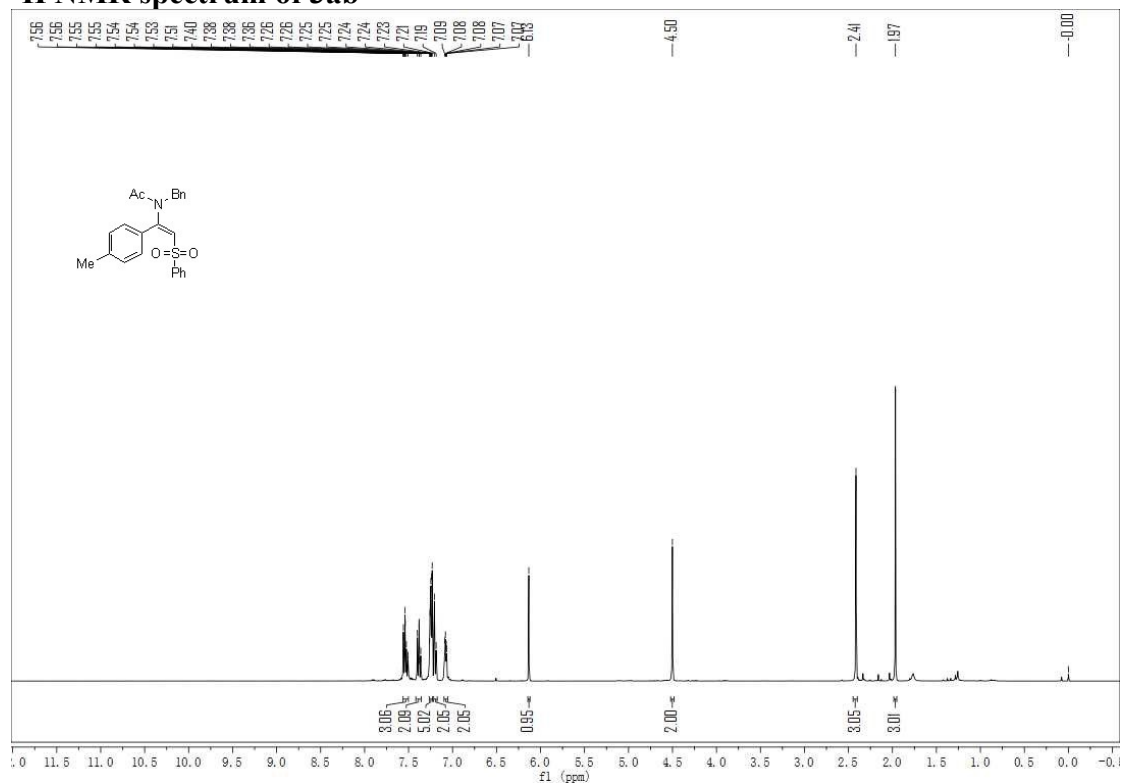
### <sup>1</sup>H NMR spectrum of 3aa



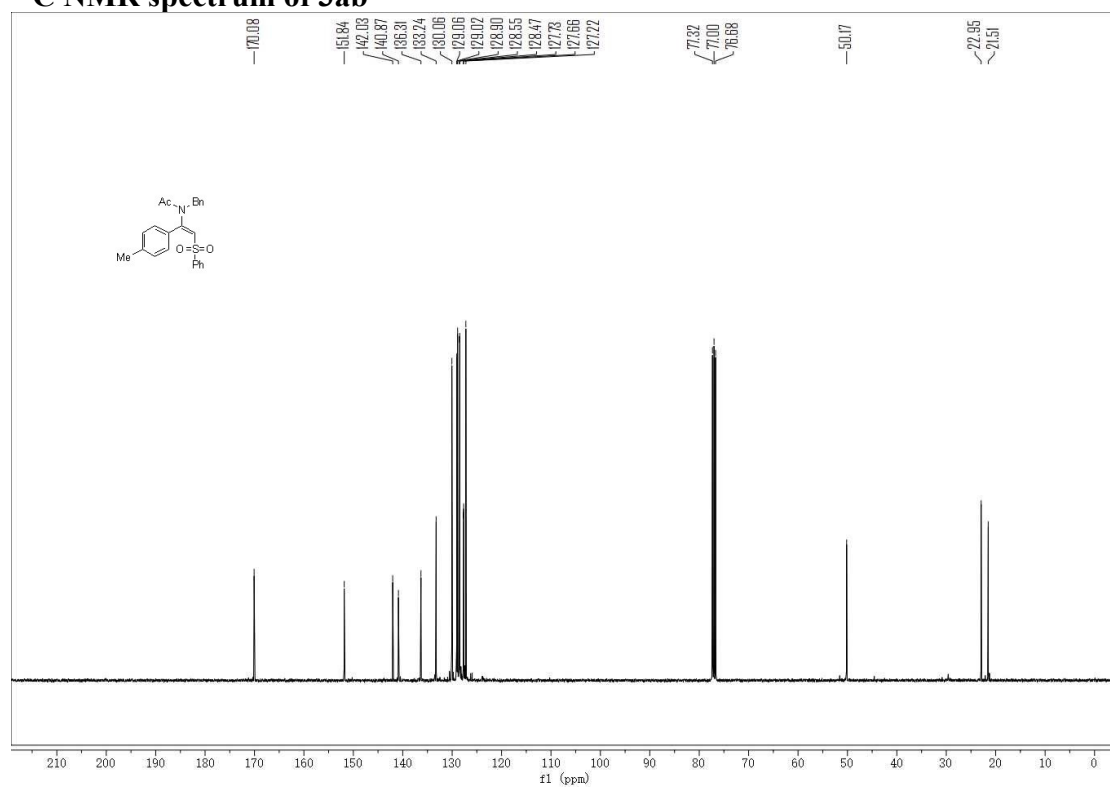
### <sup>13</sup>C NMR spectrum of 3aa



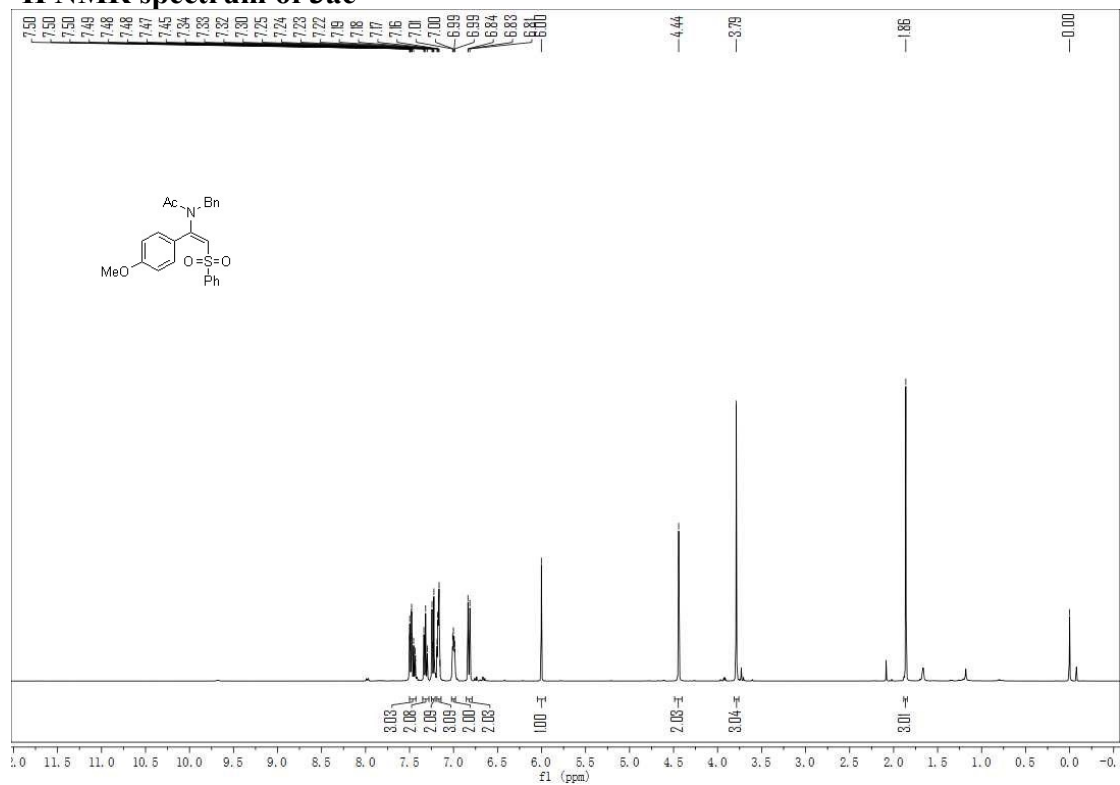
### <sup>1</sup>H NMR spectrum of 3ab



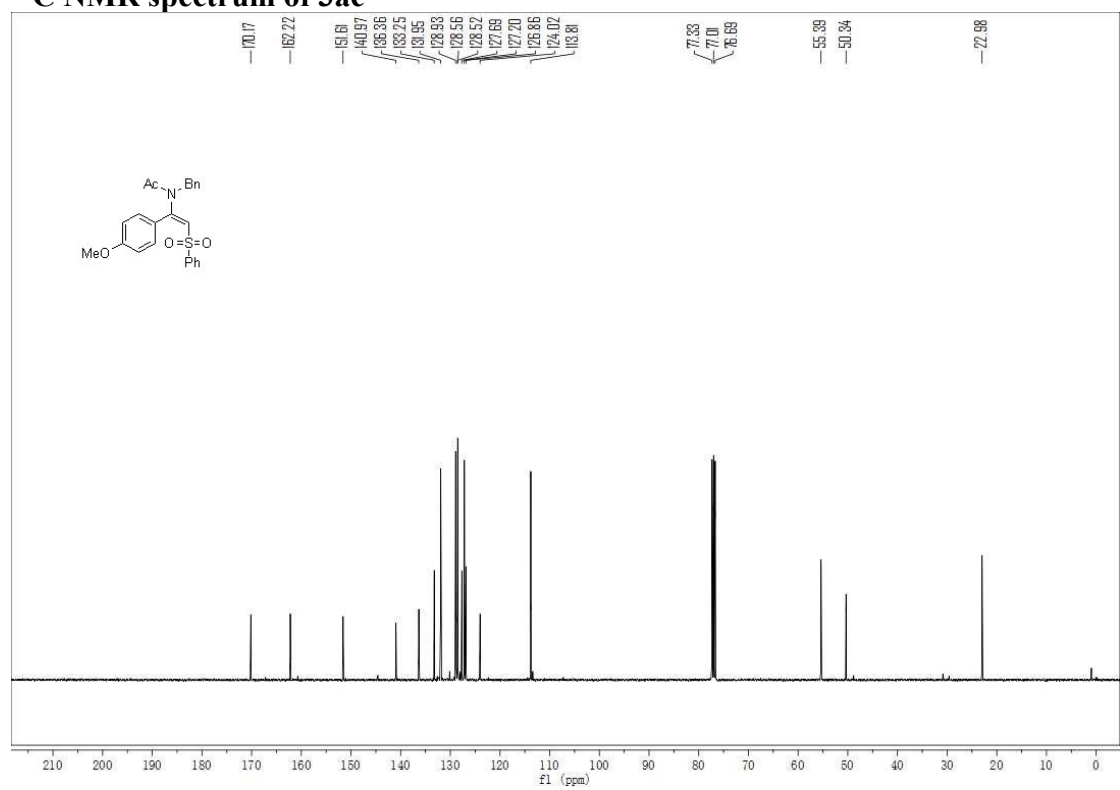
### <sup>13</sup>C NMR spectrum of 3ab



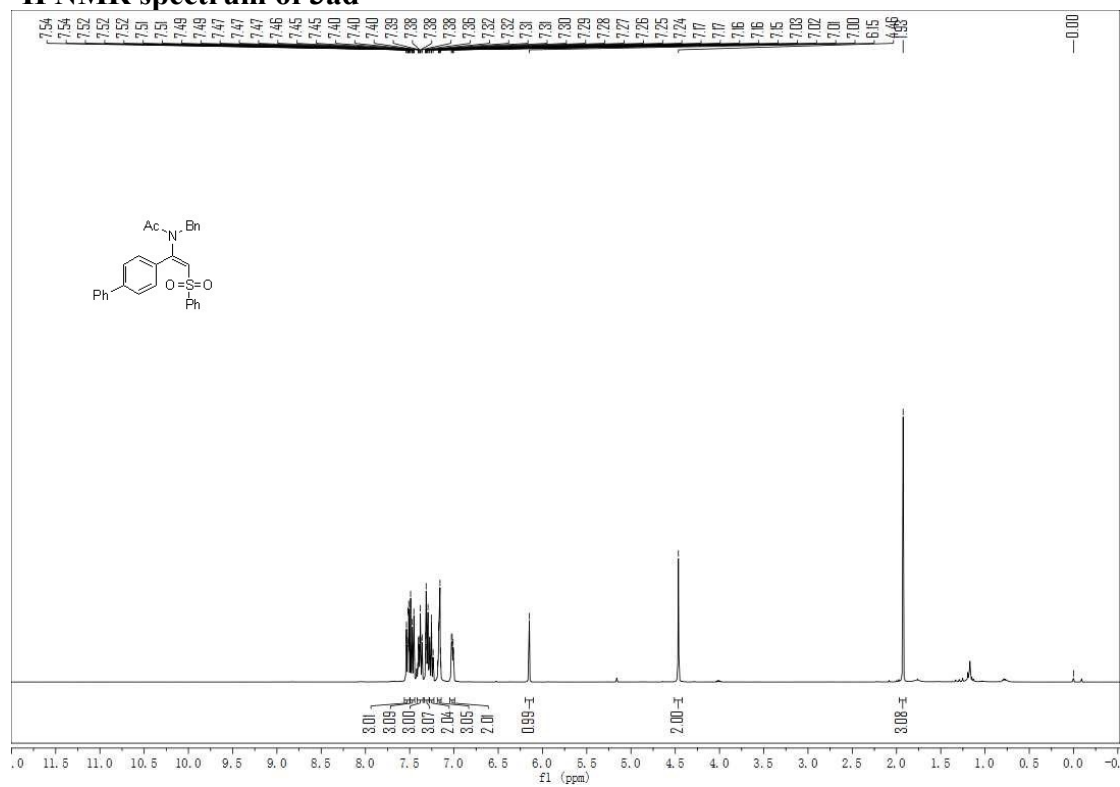
### <sup>1</sup>H NMR spectrum of 3ac



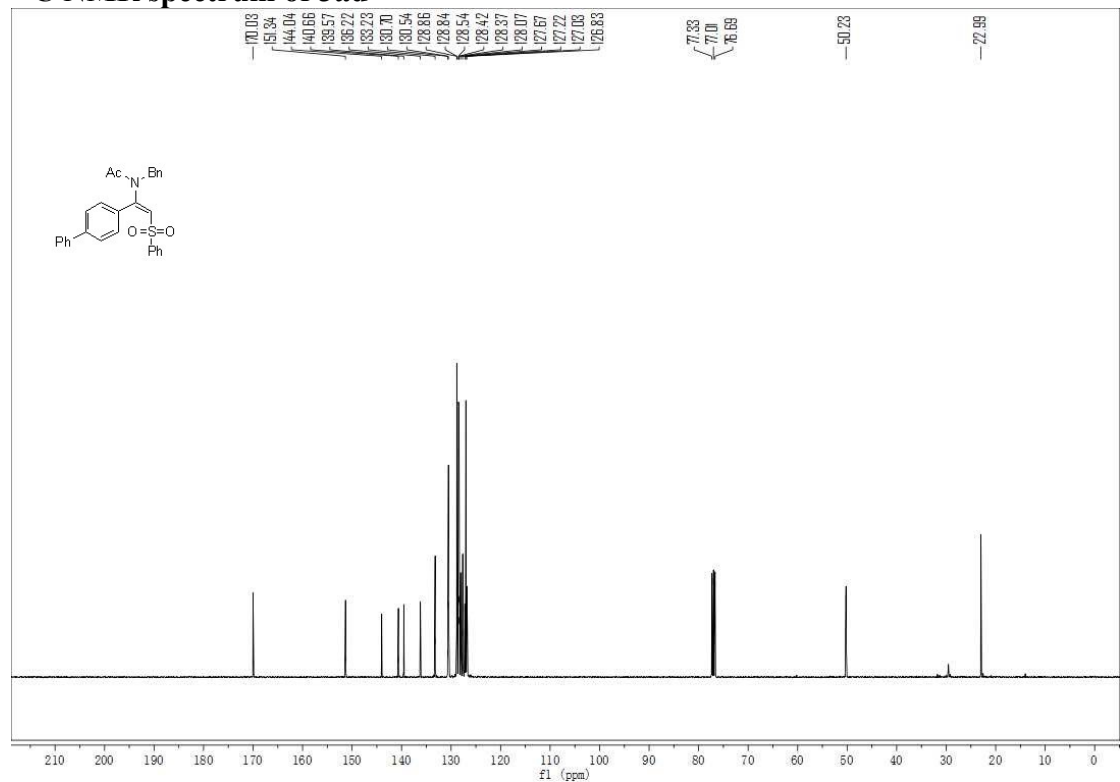
### <sup>13</sup>C NMR spectrum of 3ac



### <sup>1</sup>H NMR spectrum of 3ad

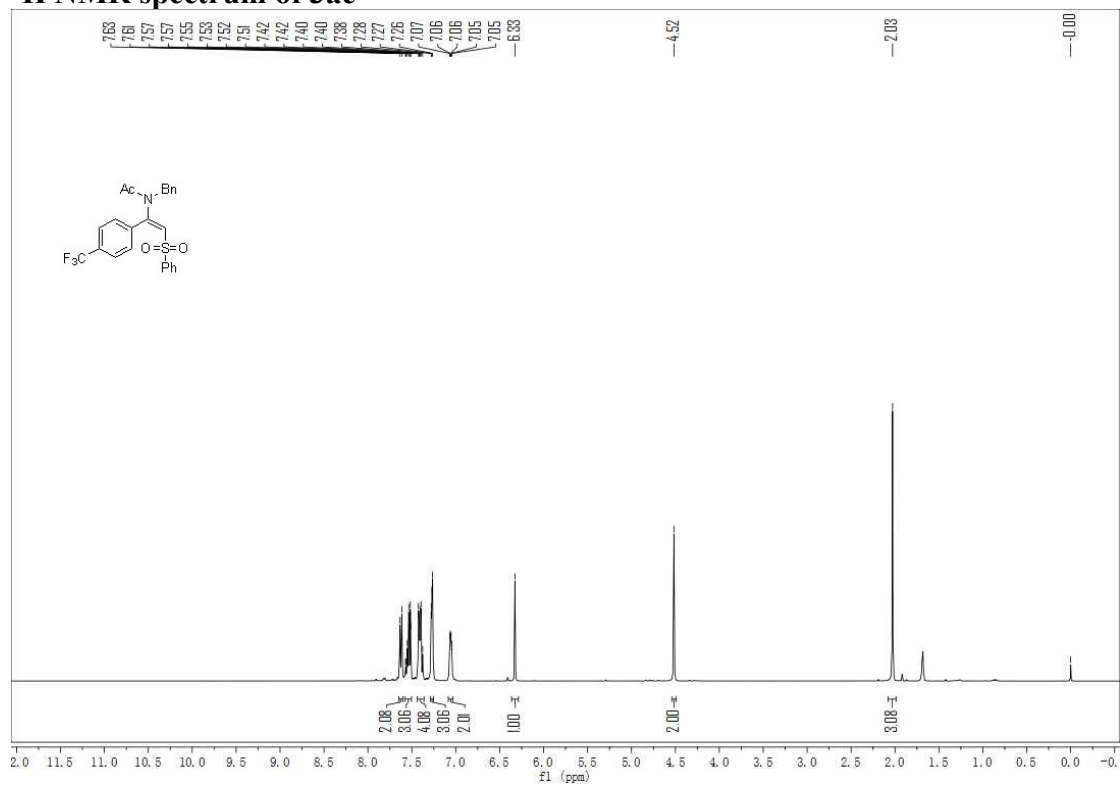


### <sup>13</sup>C NMR spectrum of 3ad

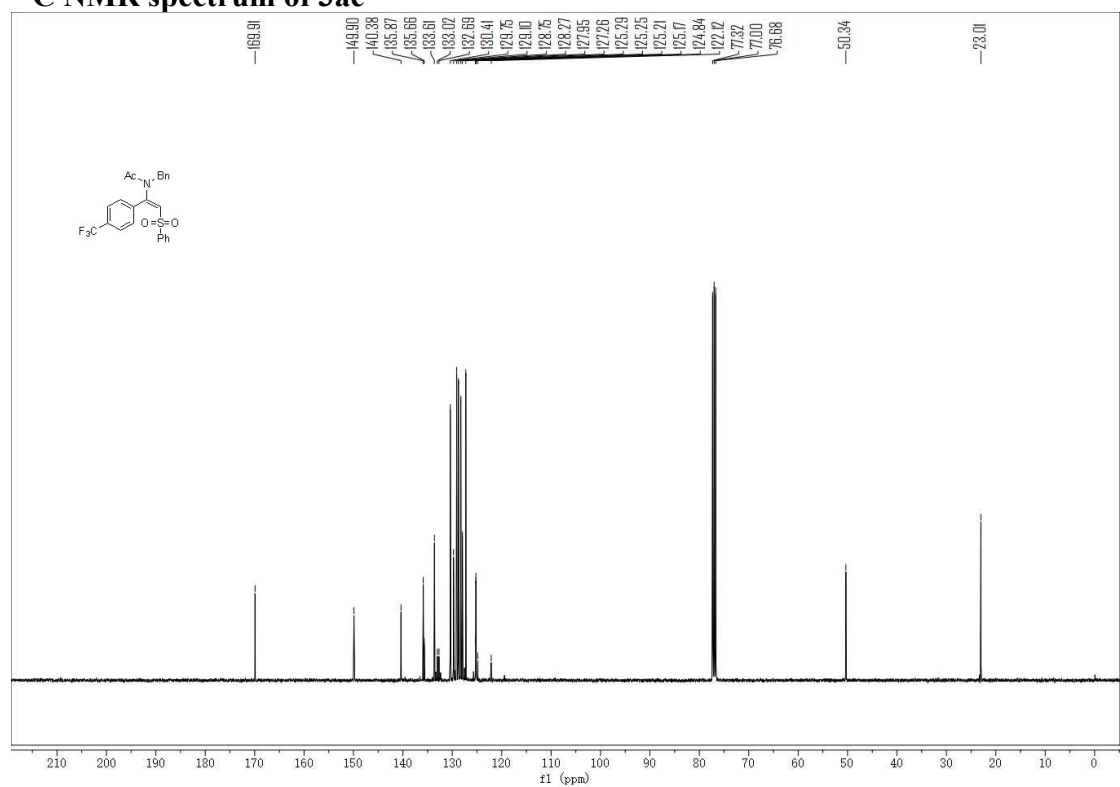




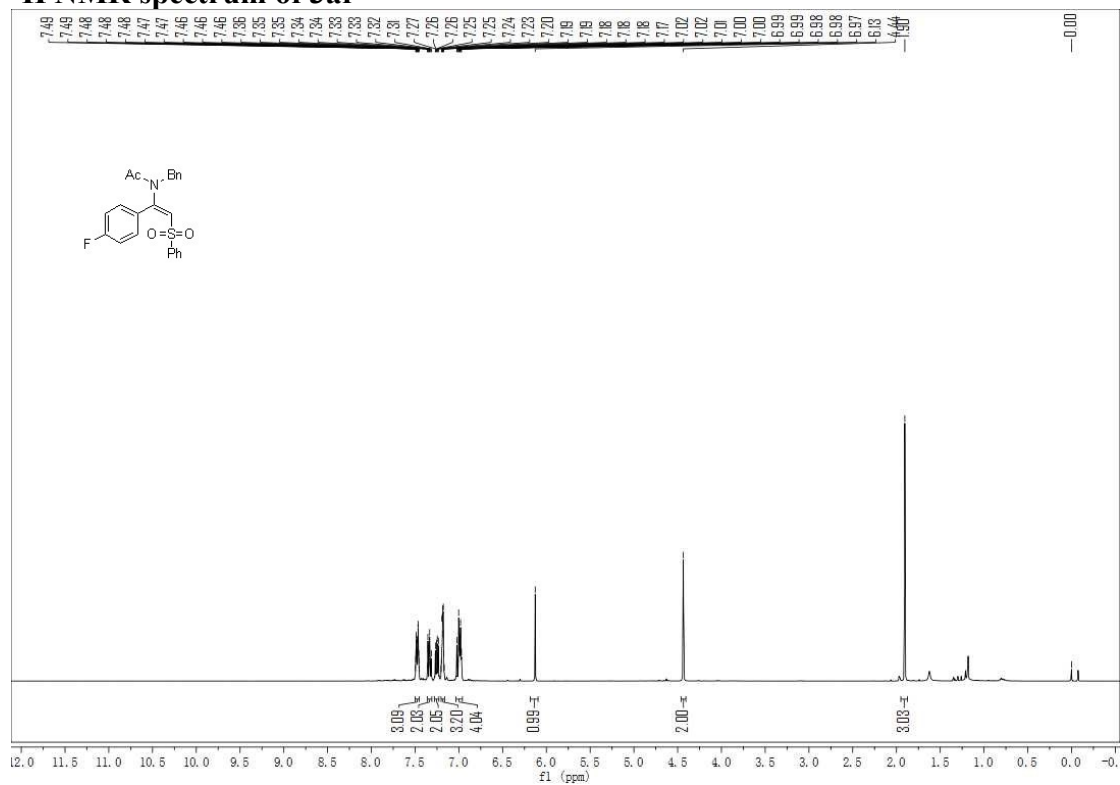
### <sup>1</sup>H NMR spectrum of 3ae



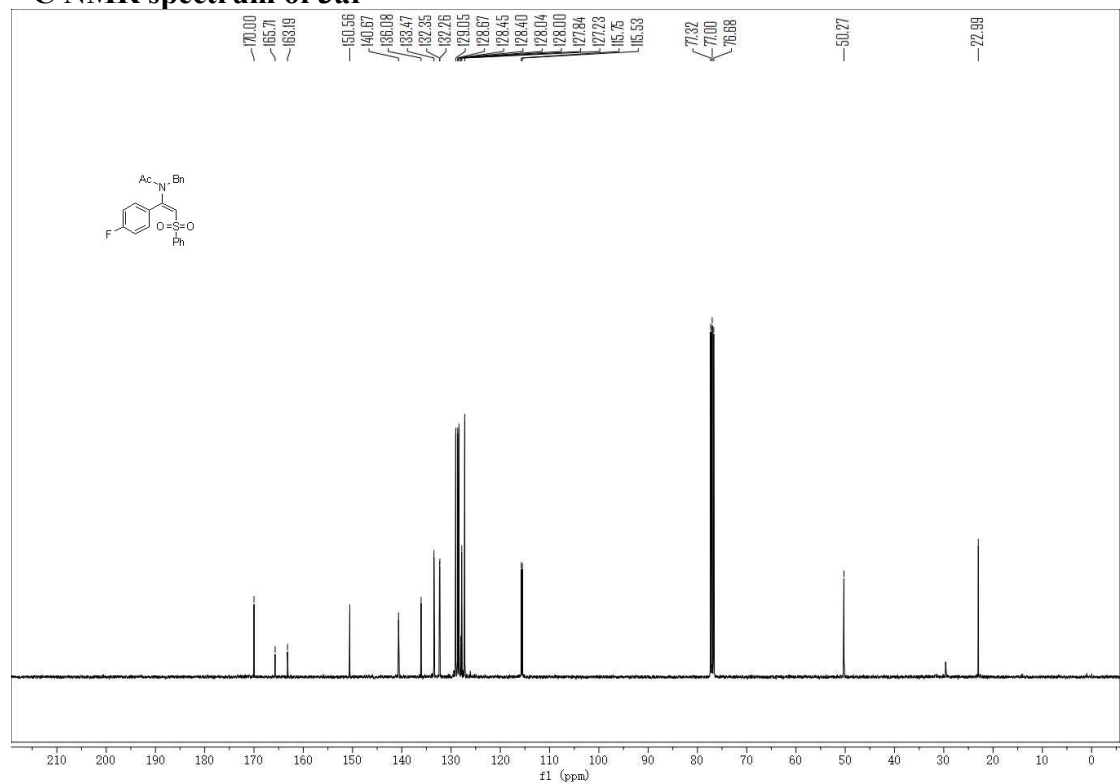
### <sup>13</sup>C NMR spectrum of 3ae



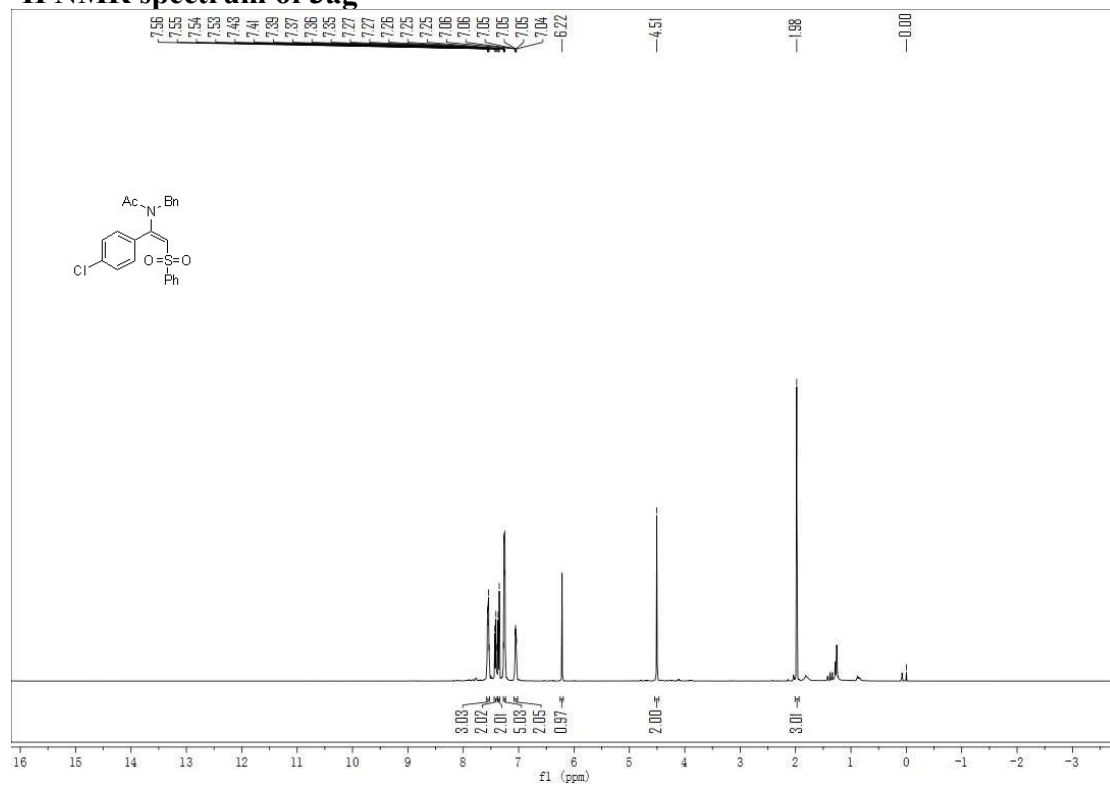
# <sup>1</sup>H NMR spectrum of 3af



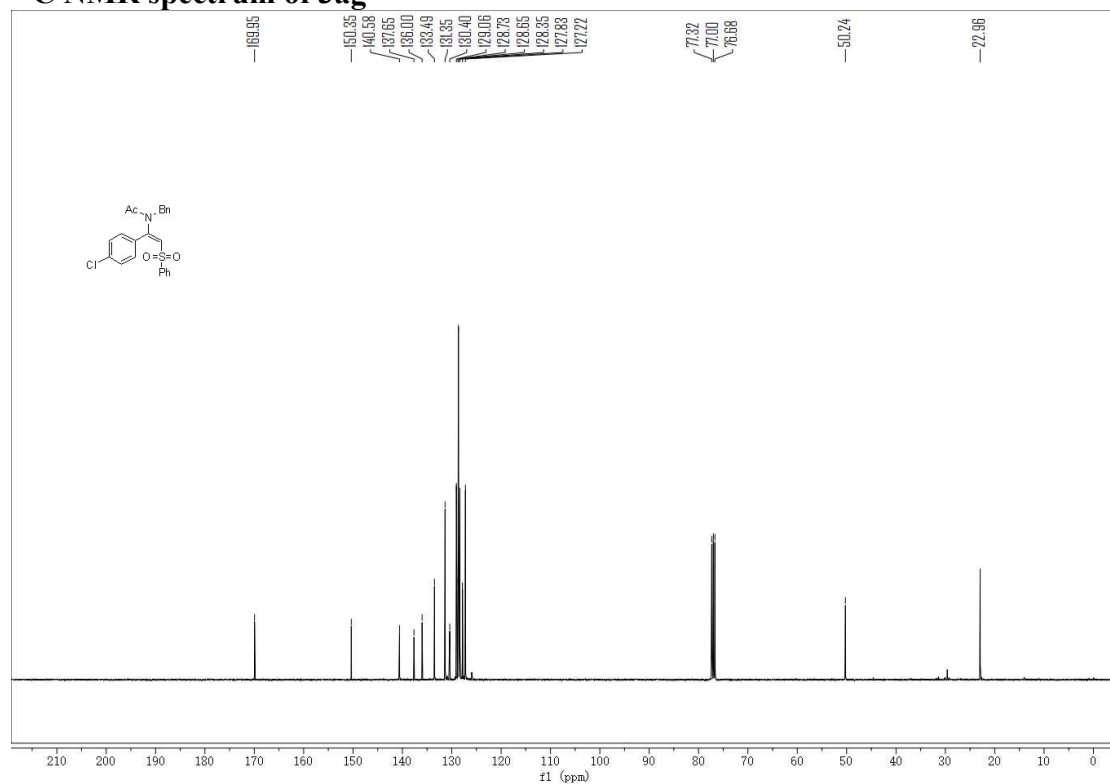
# <sup>13</sup>C NMR spectrum of 3af



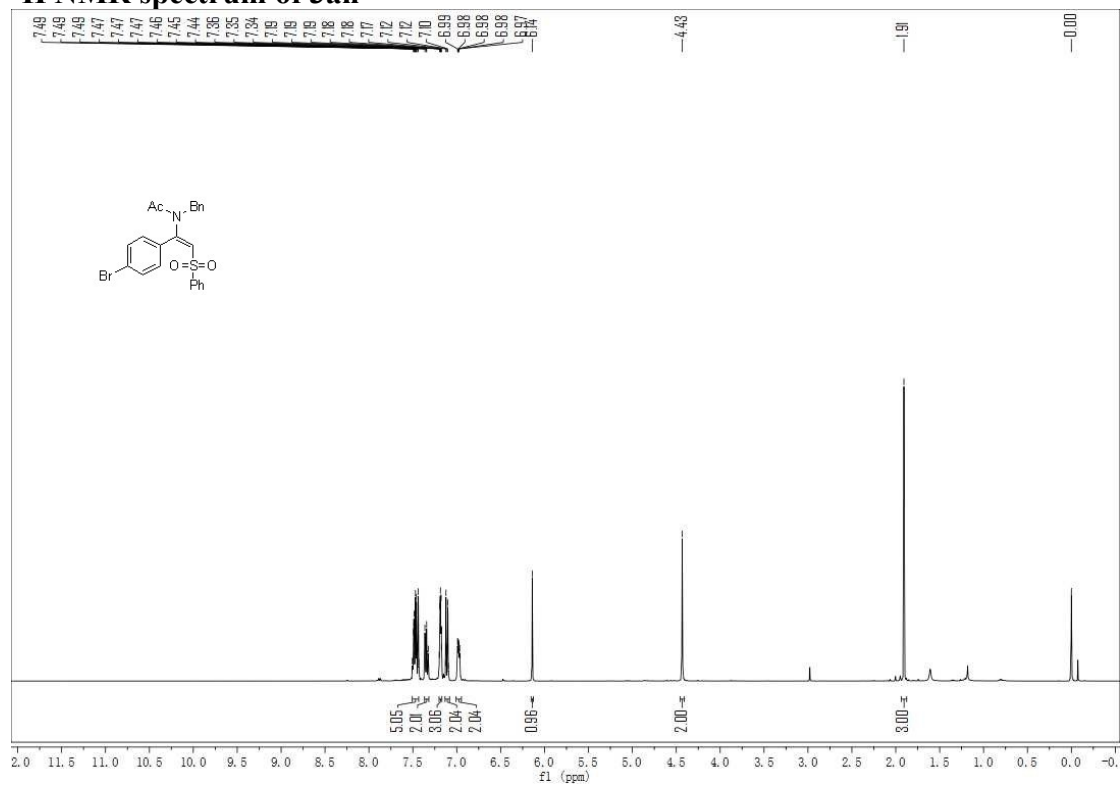
### <sup>1</sup>H NMR spectrum of 3ag



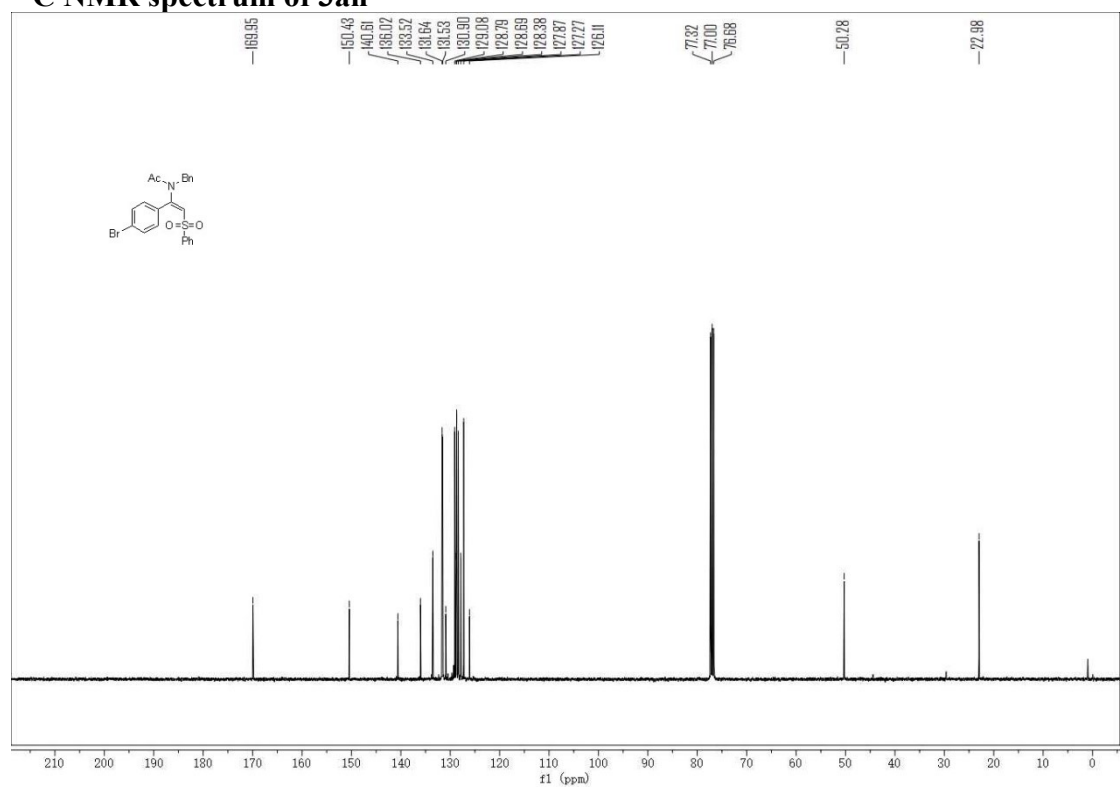
### <sup>13</sup>C NMR spectrum of 3ag



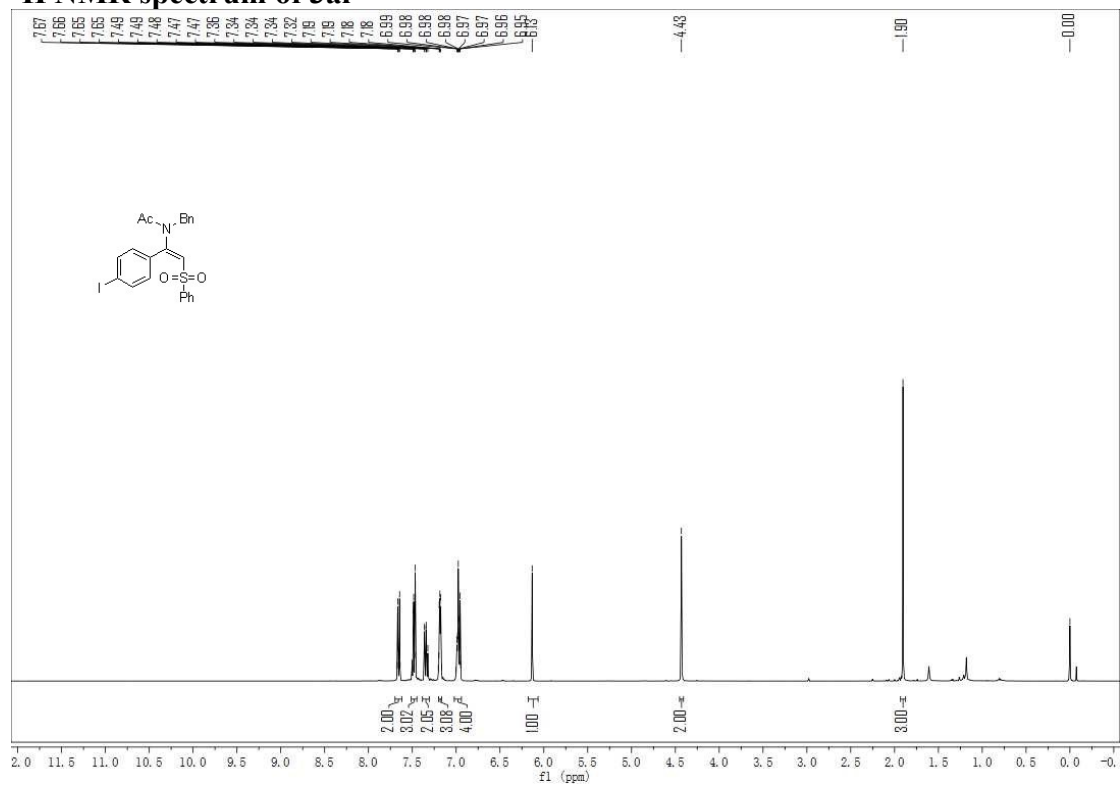
### <sup>1</sup>H NMR spectrum of 3ah



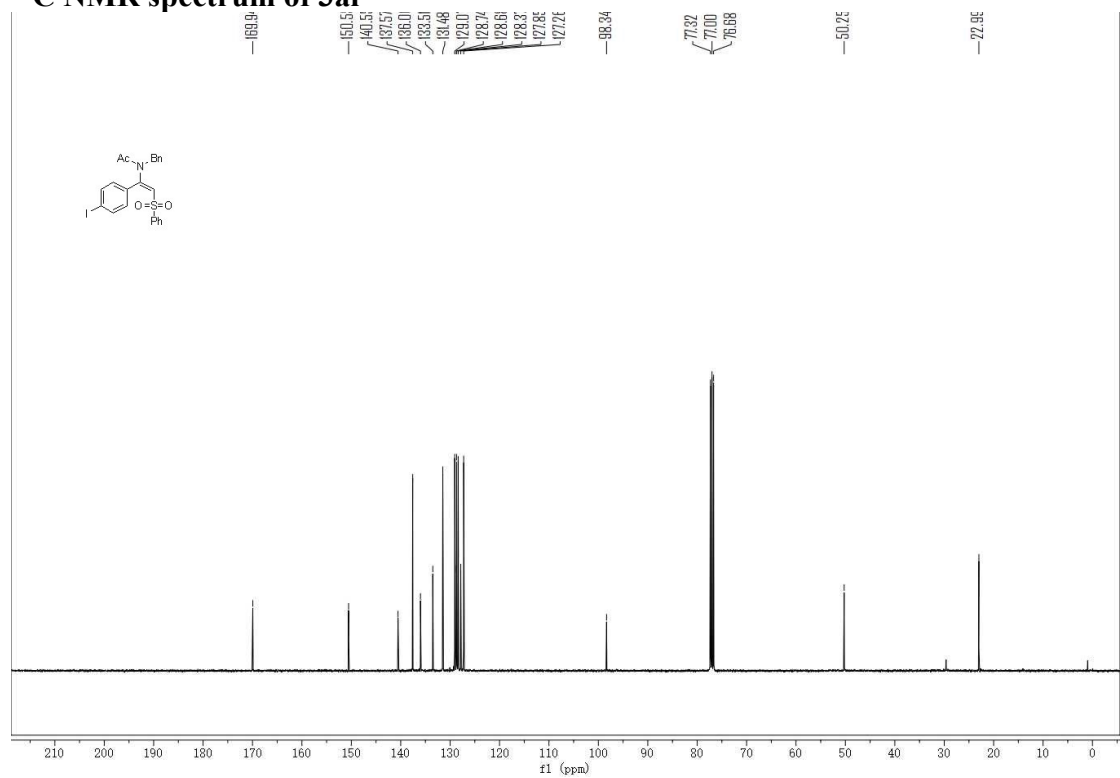
### <sup>13</sup>C NMR spectrum of 3ah



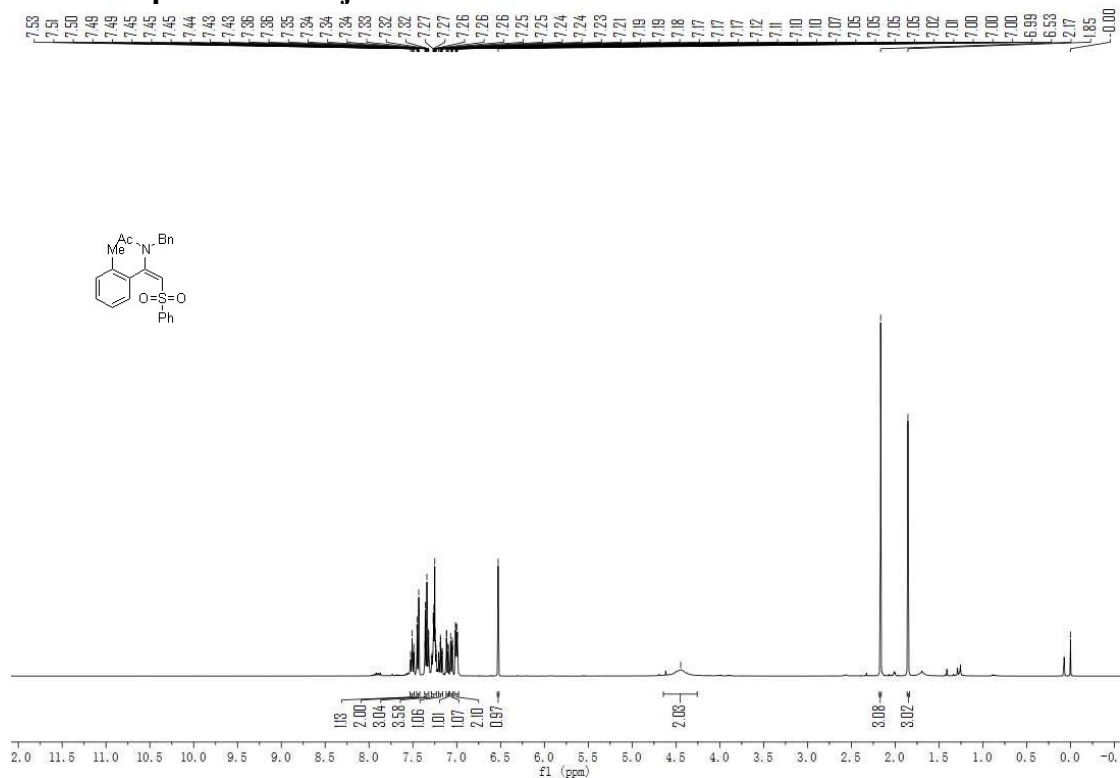
### <sup>1</sup>H NMR spectrum of 3ai



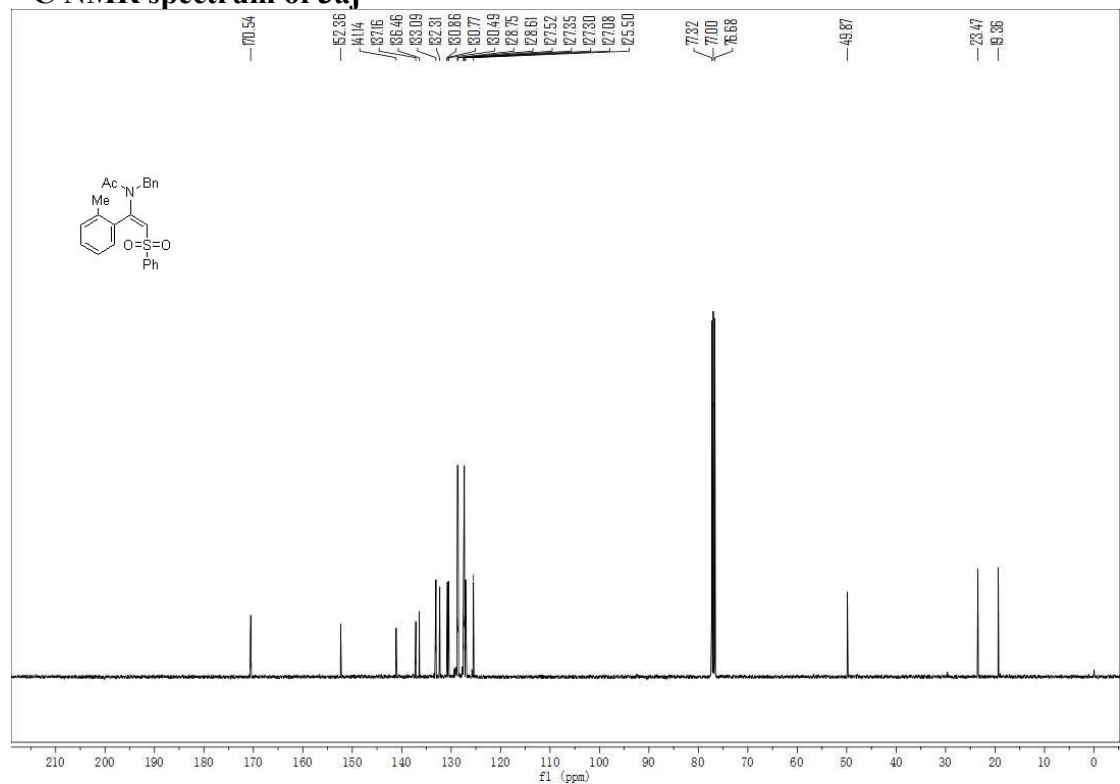
### <sup>13</sup>C NMR spectrum of 3ai



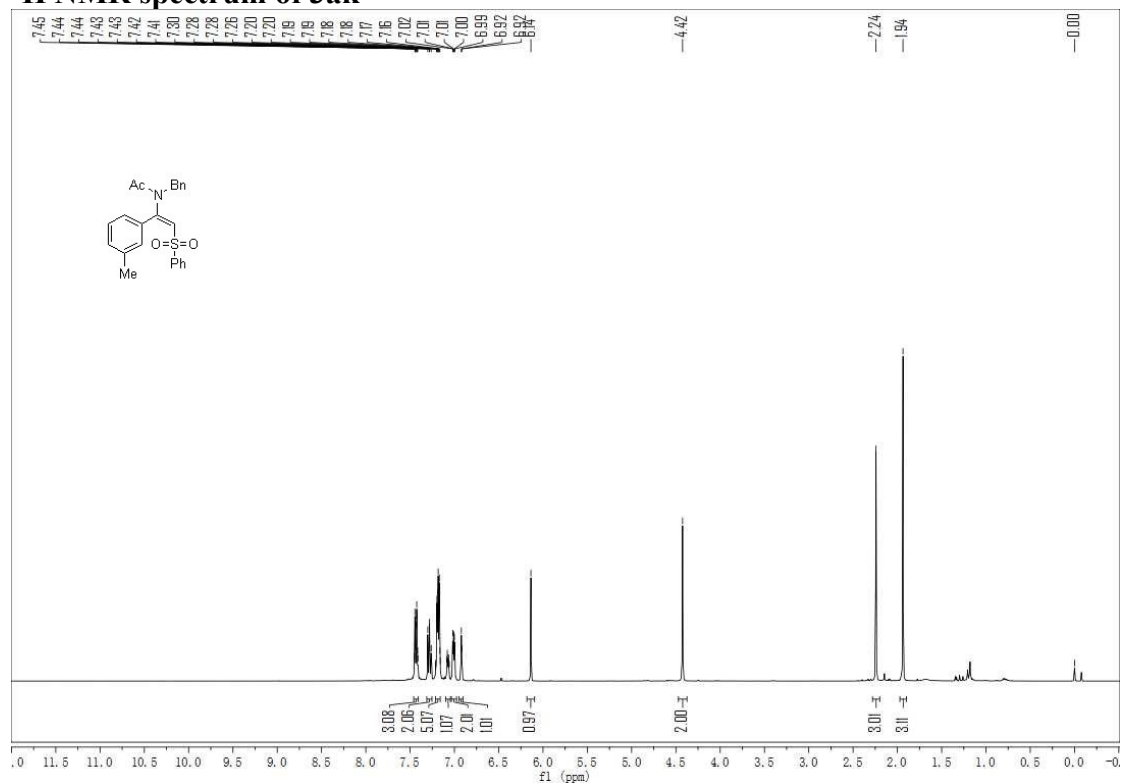
# <sup>1</sup>H NMR spectrum of 3aj



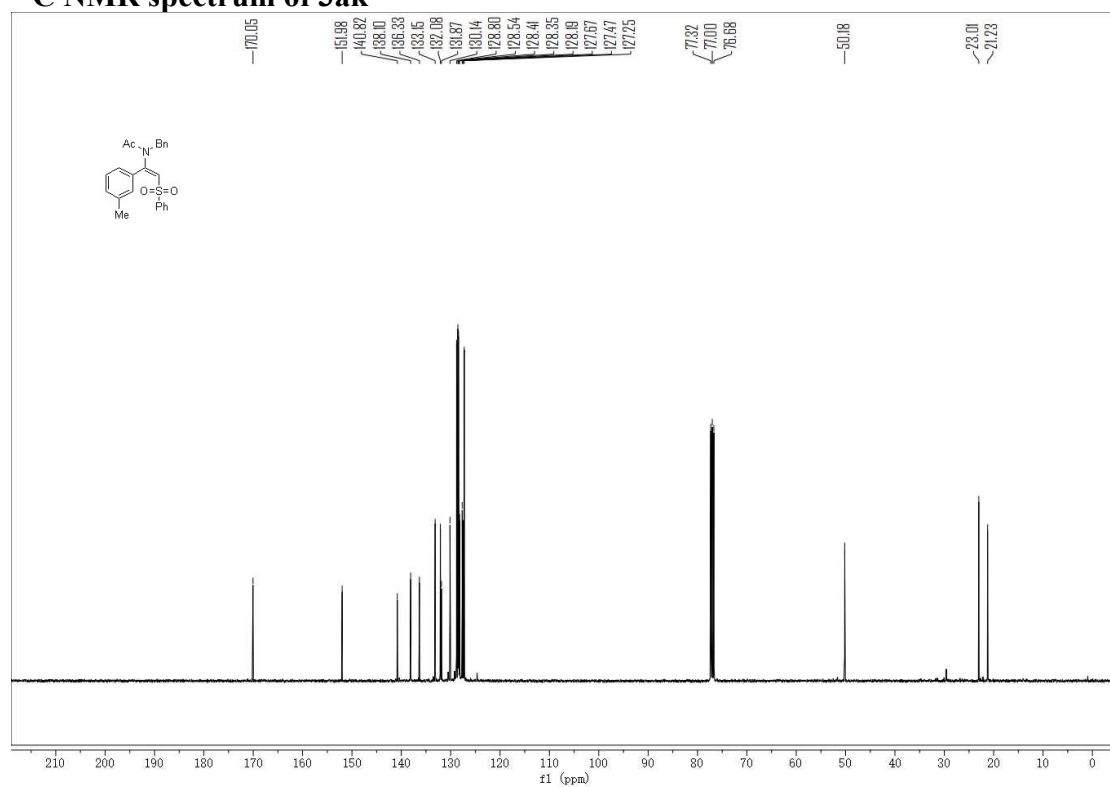
# <sup>13</sup>C NMR spectrum of 3aj



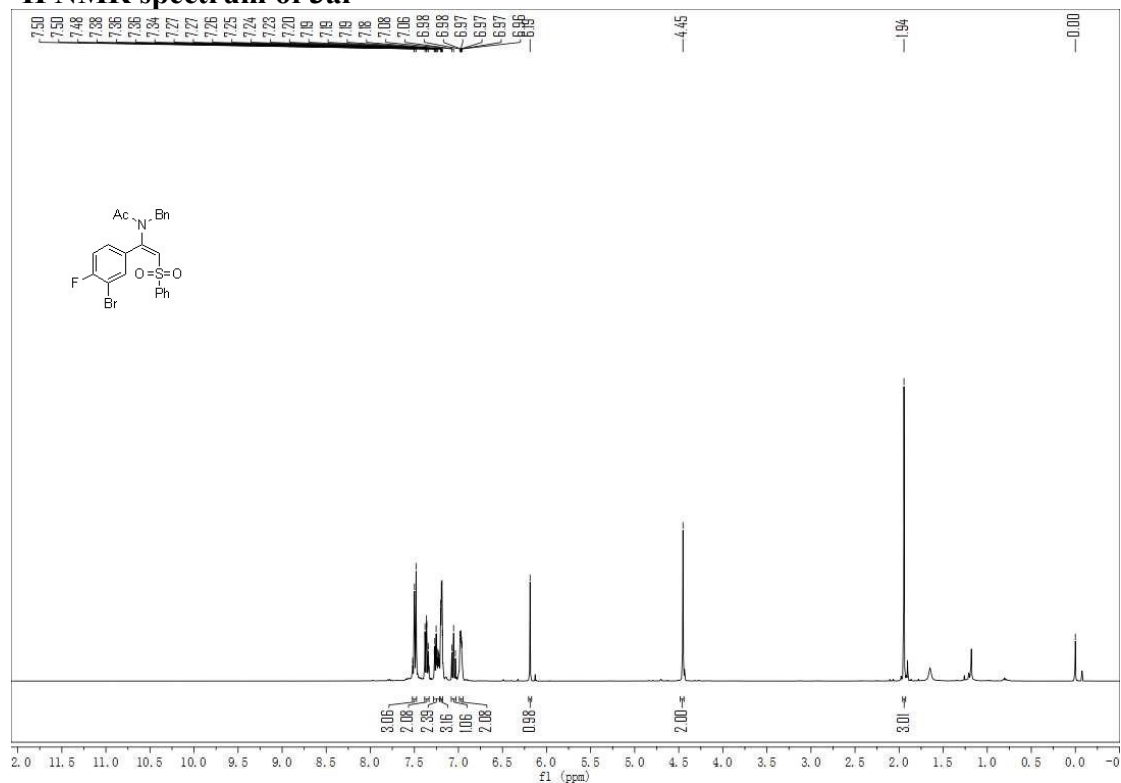
### <sup>1</sup>H NMR spectrum of 3ak



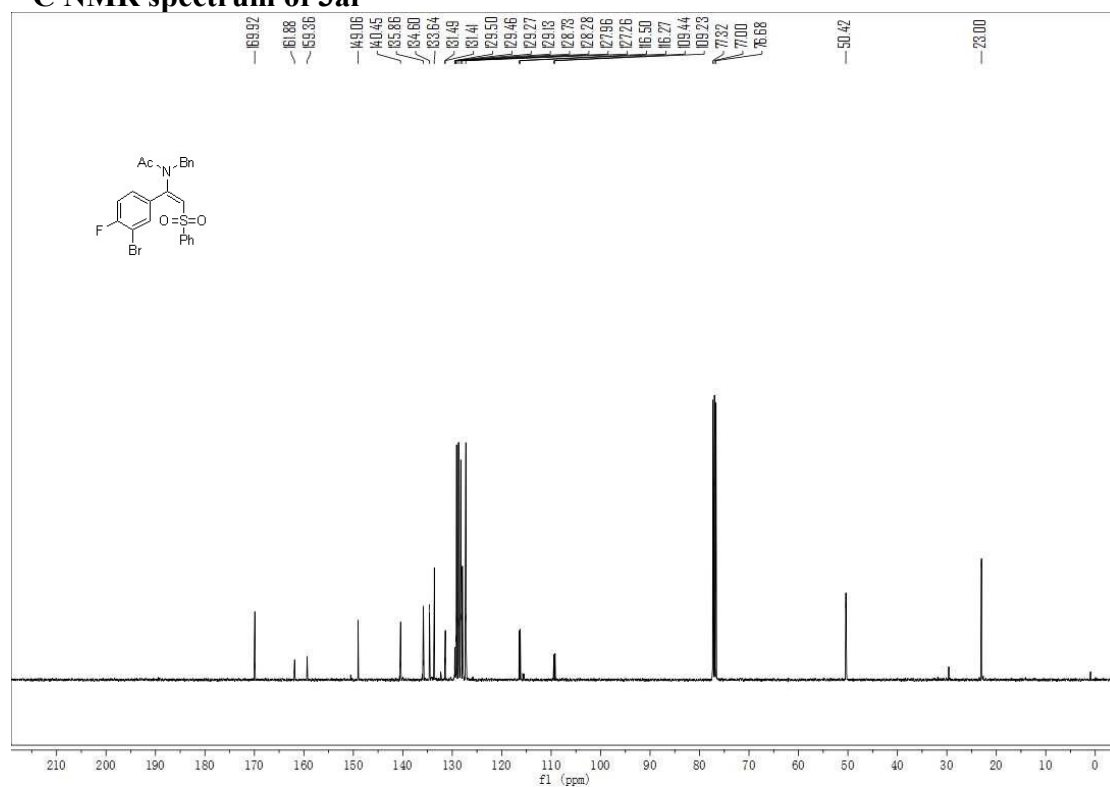
### <sup>13</sup>C NMR spectrum of 3ak



### <sup>1</sup>H NMR spectrum of 3al

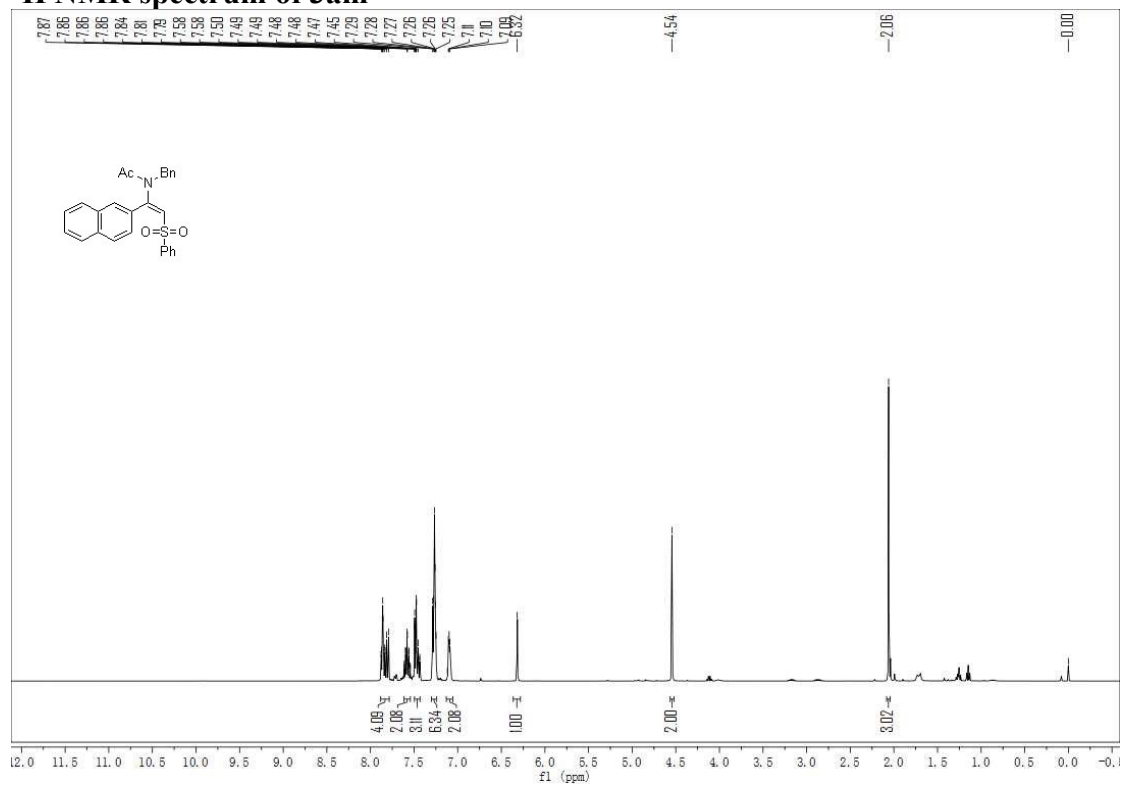


### <sup>13</sup>C NMR spectrum of 3al

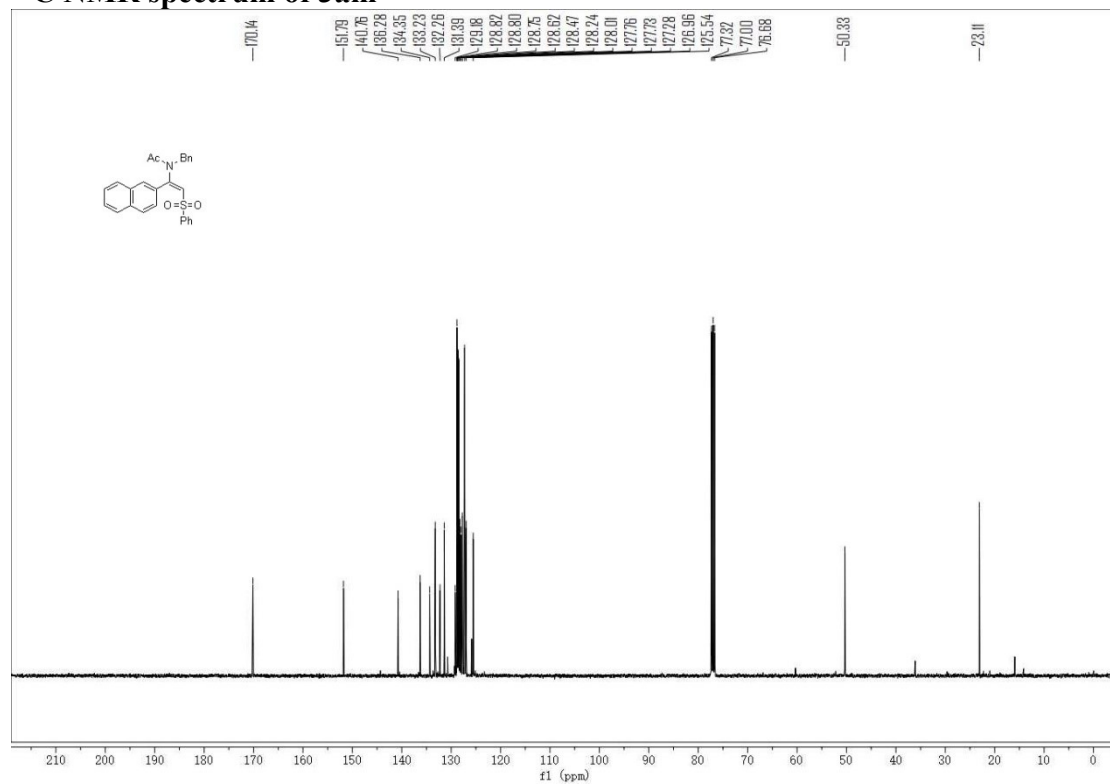




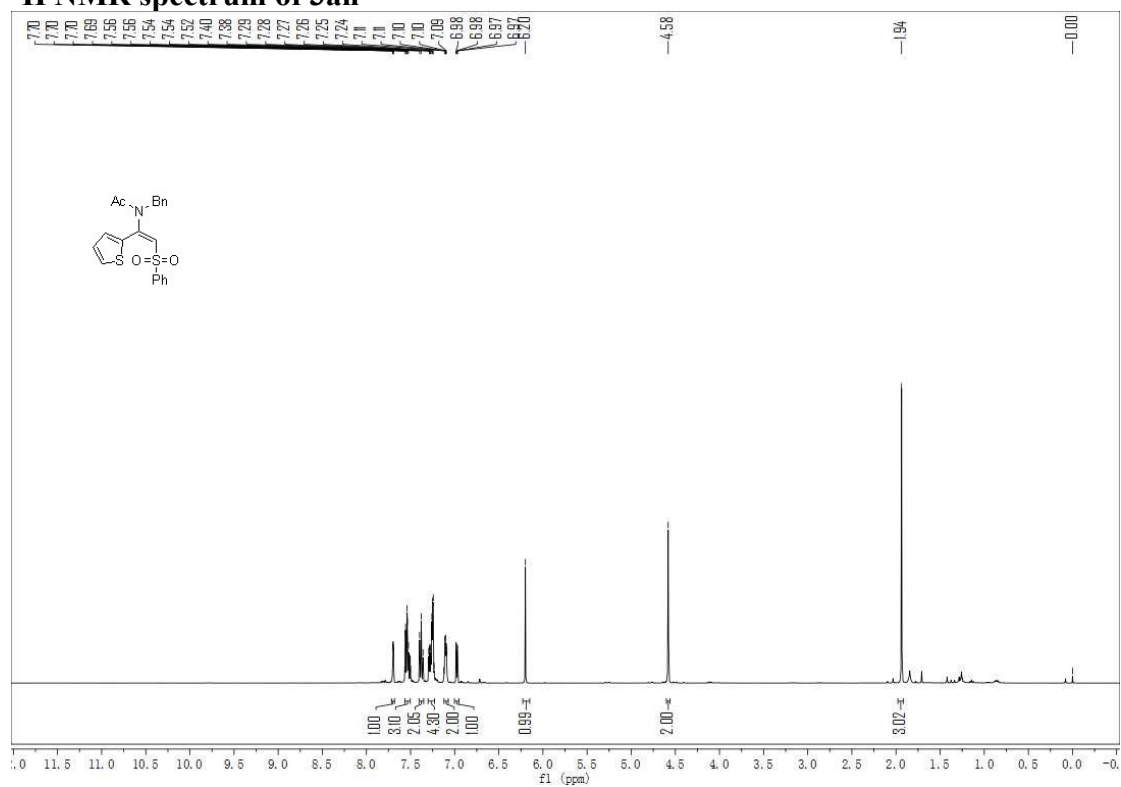
### <sup>1</sup>H NMR spectrum of 3am



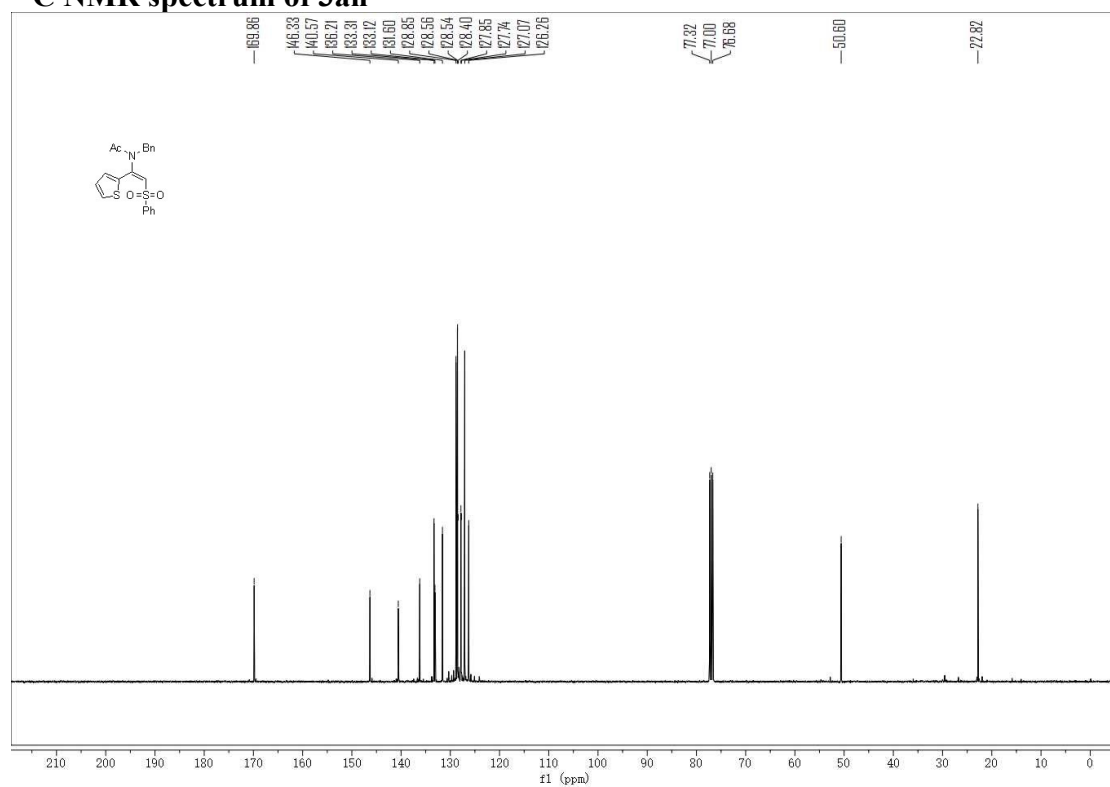
### <sup>13</sup>C NMR spectrum of 3am



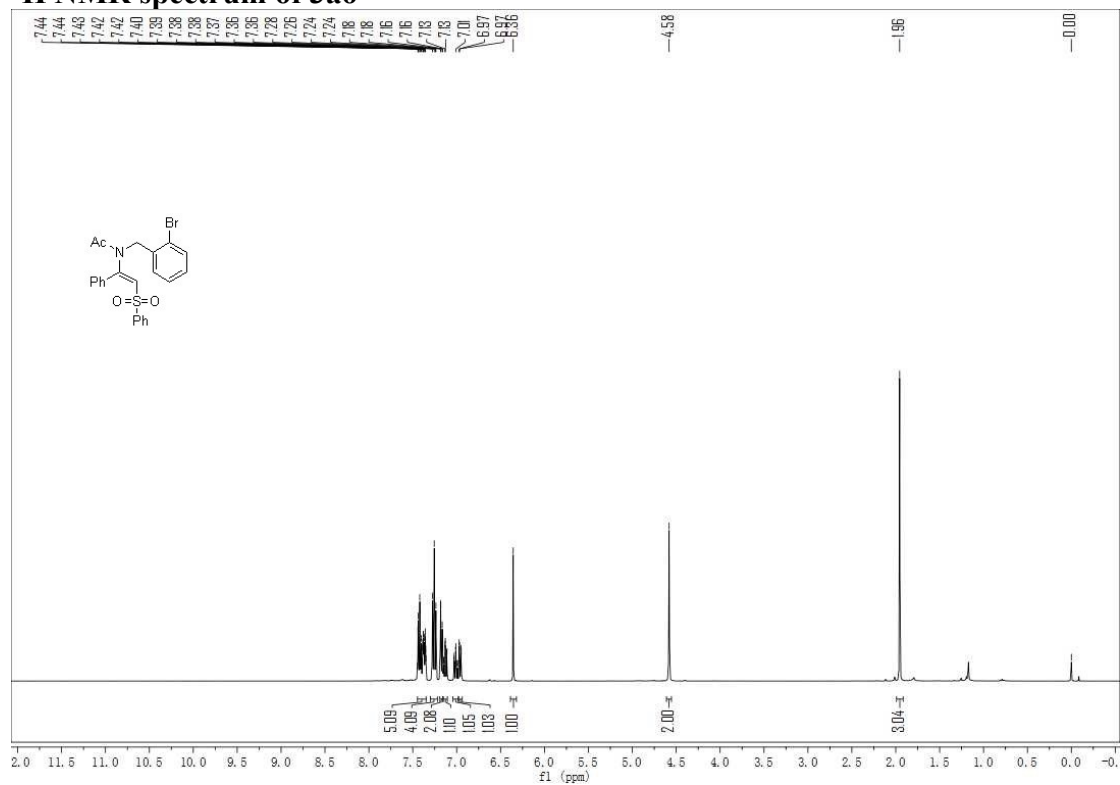
### <sup>1</sup>H NMR spectrum of 3an



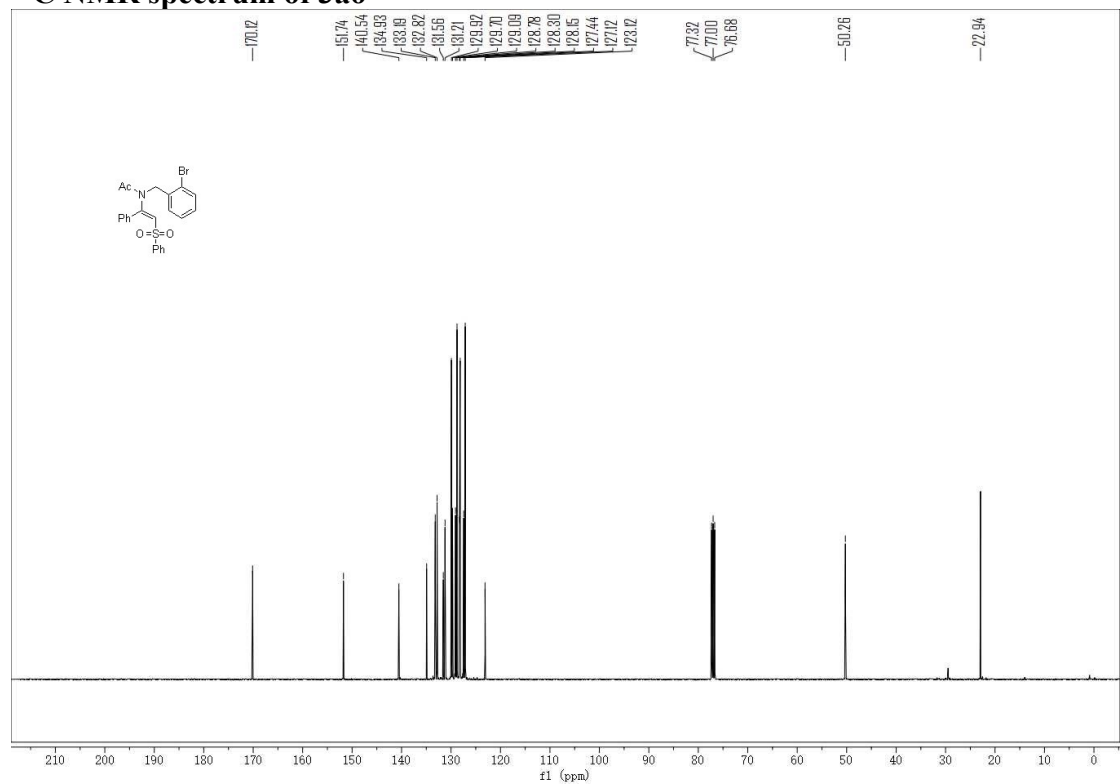
### <sup>13</sup>C NMR spectrum of 3an



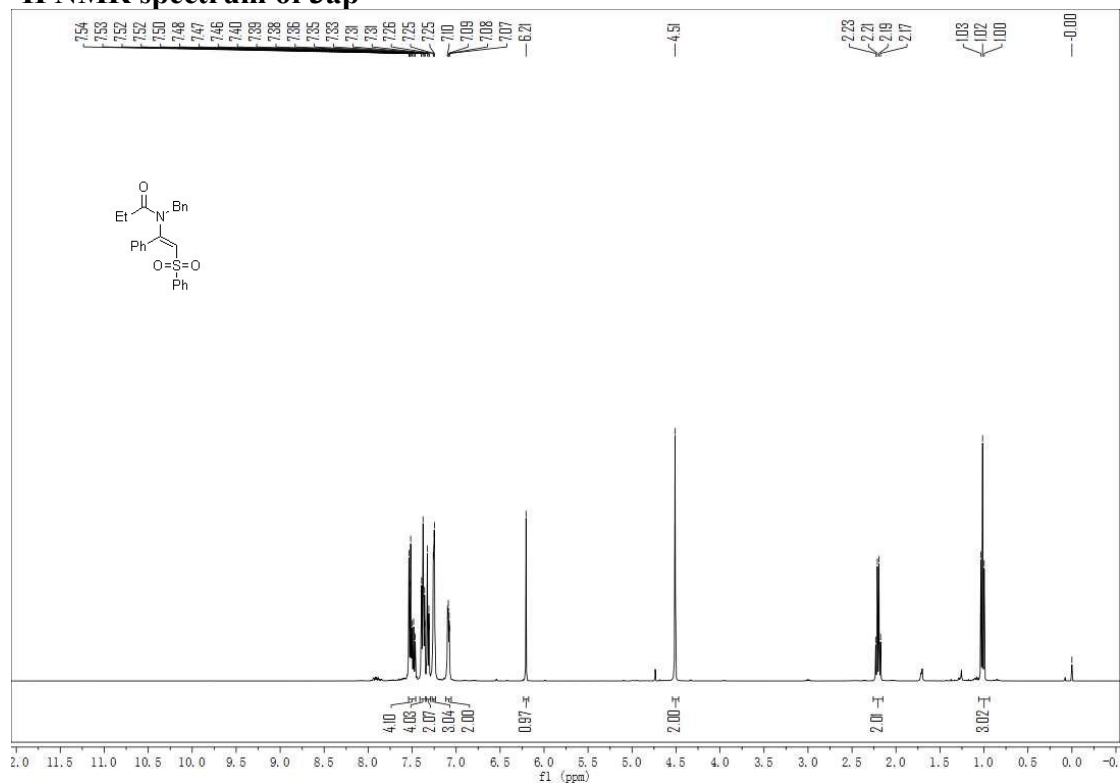
### <sup>1</sup>H NMR spectrum of 3ao



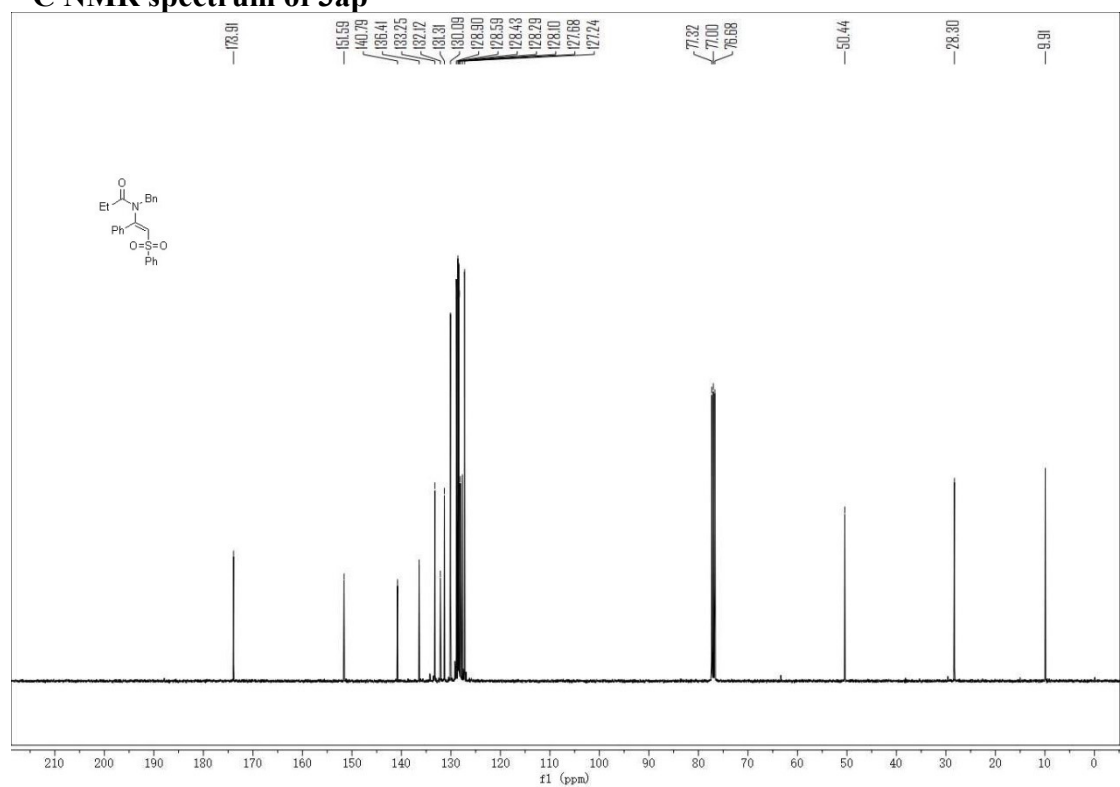
### <sup>13</sup>C NMR spectrum of 3ao



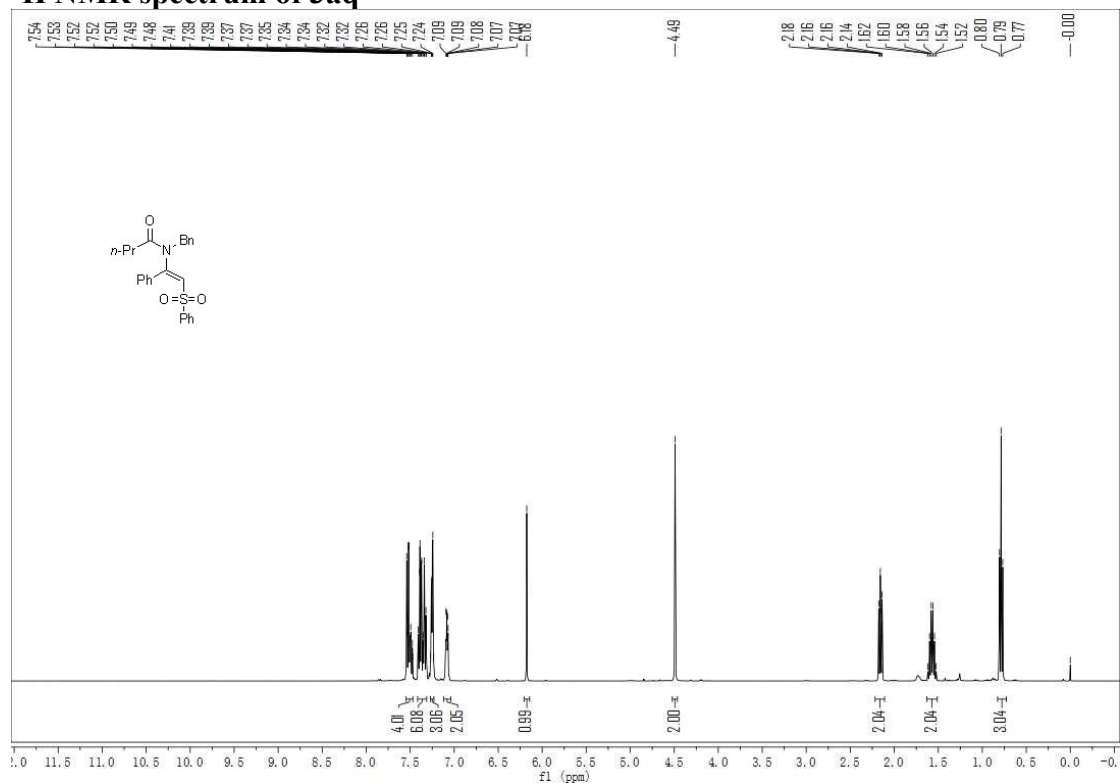
### <sup>1</sup>H NMR spectrum of 3ap



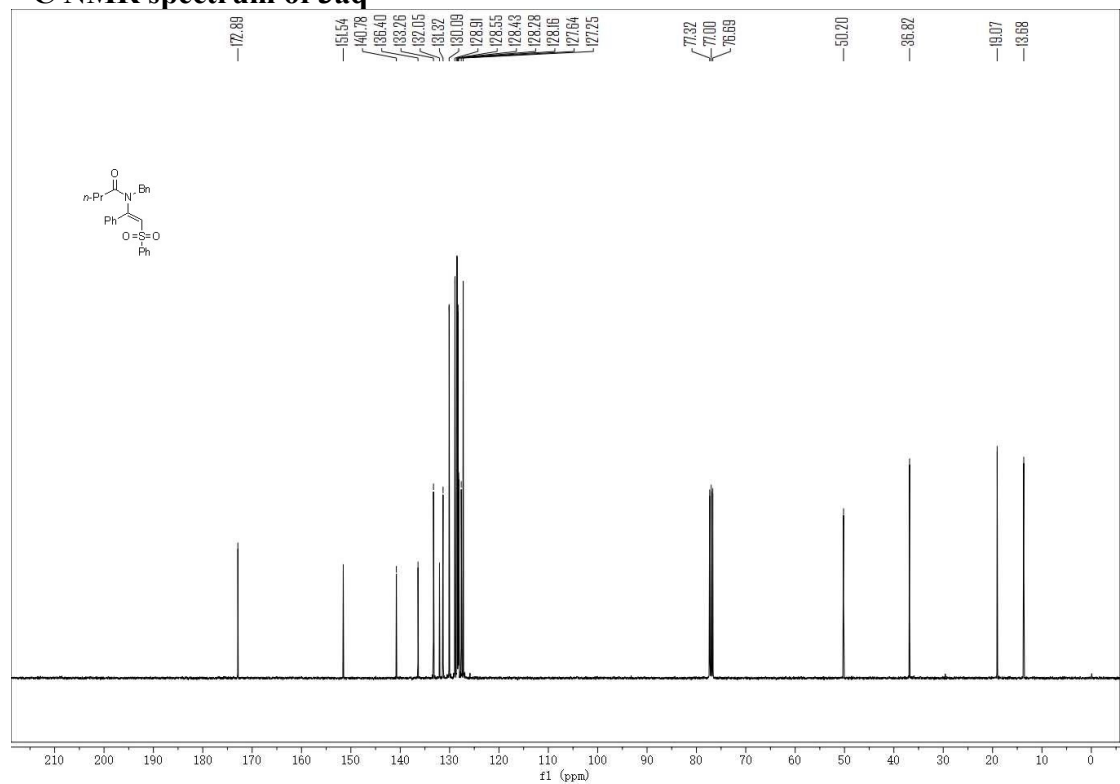
### <sup>13</sup>C NMR spectrum of 3ap



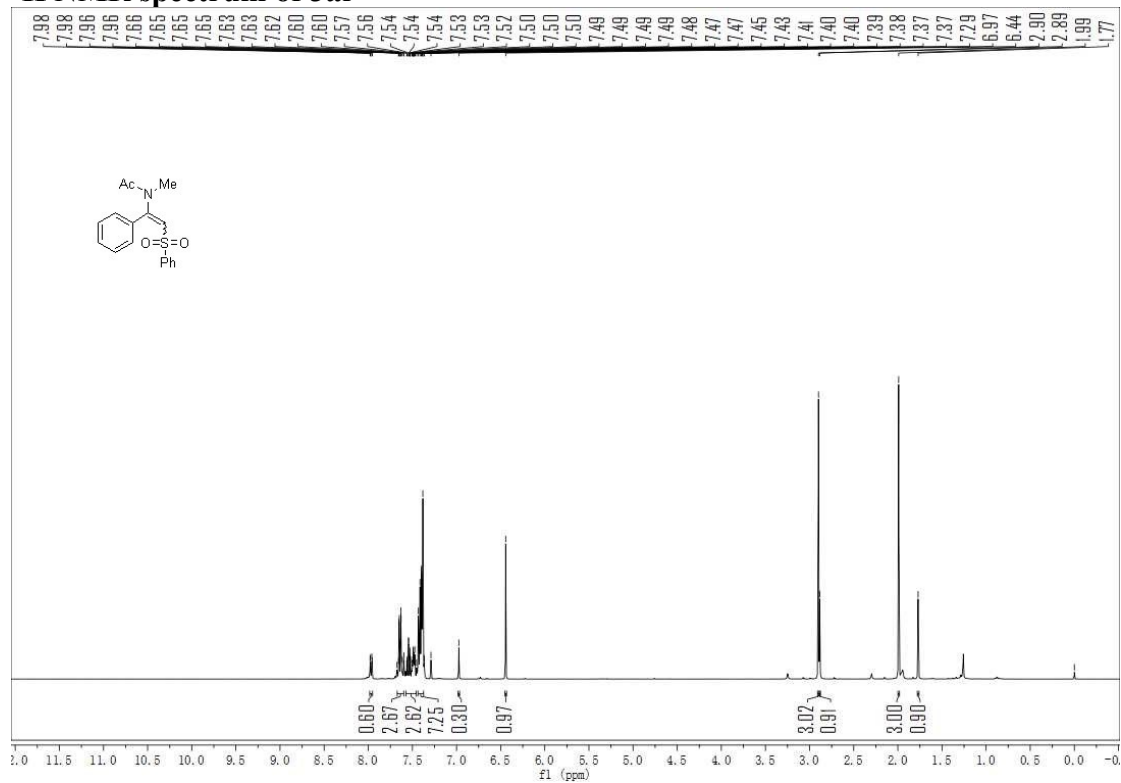
### <sup>1</sup>H NMR spectrum of 3aq



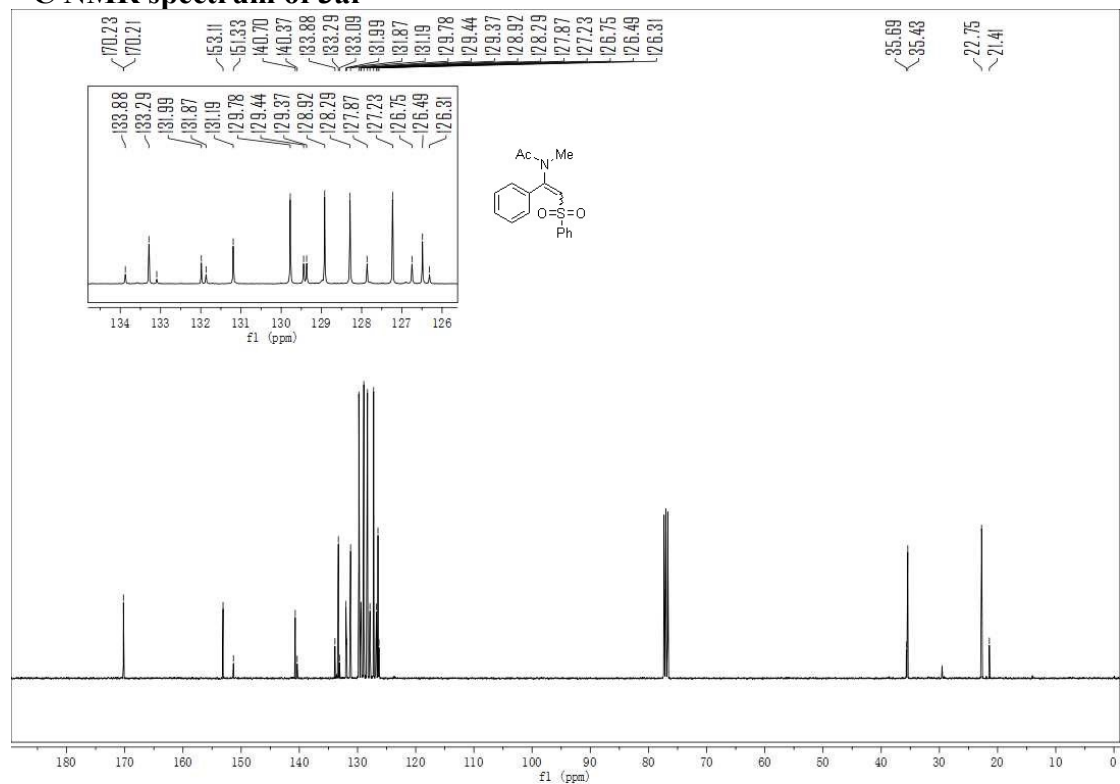
### <sup>13</sup>C NMR spectrum of 3aq



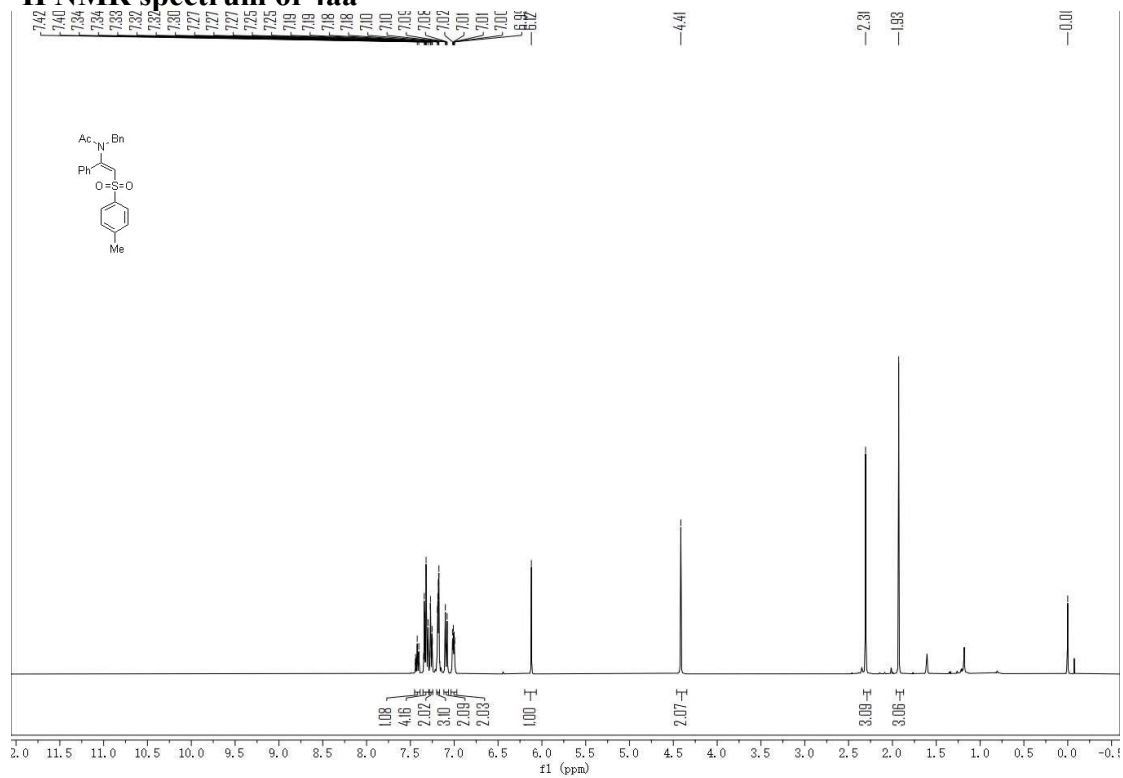
### <sup>1</sup>H NMR spectrum of 3ar



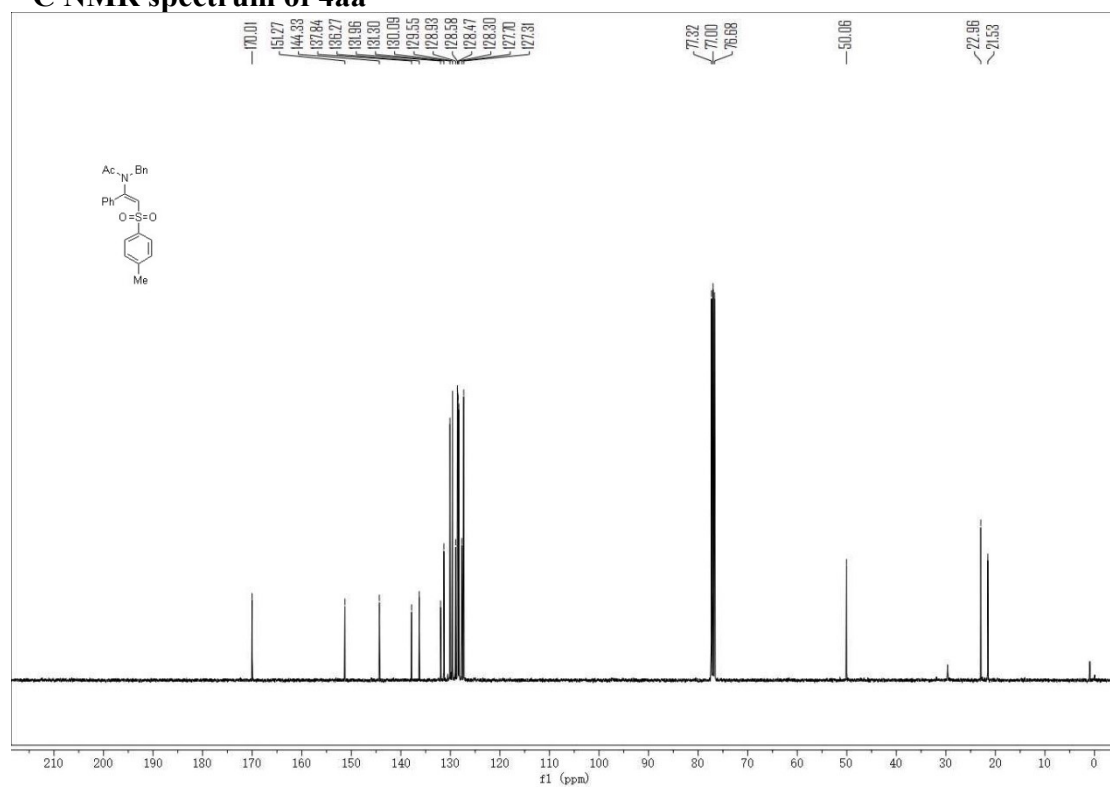
### <sup>13</sup>C NMR spectrum of 3ar



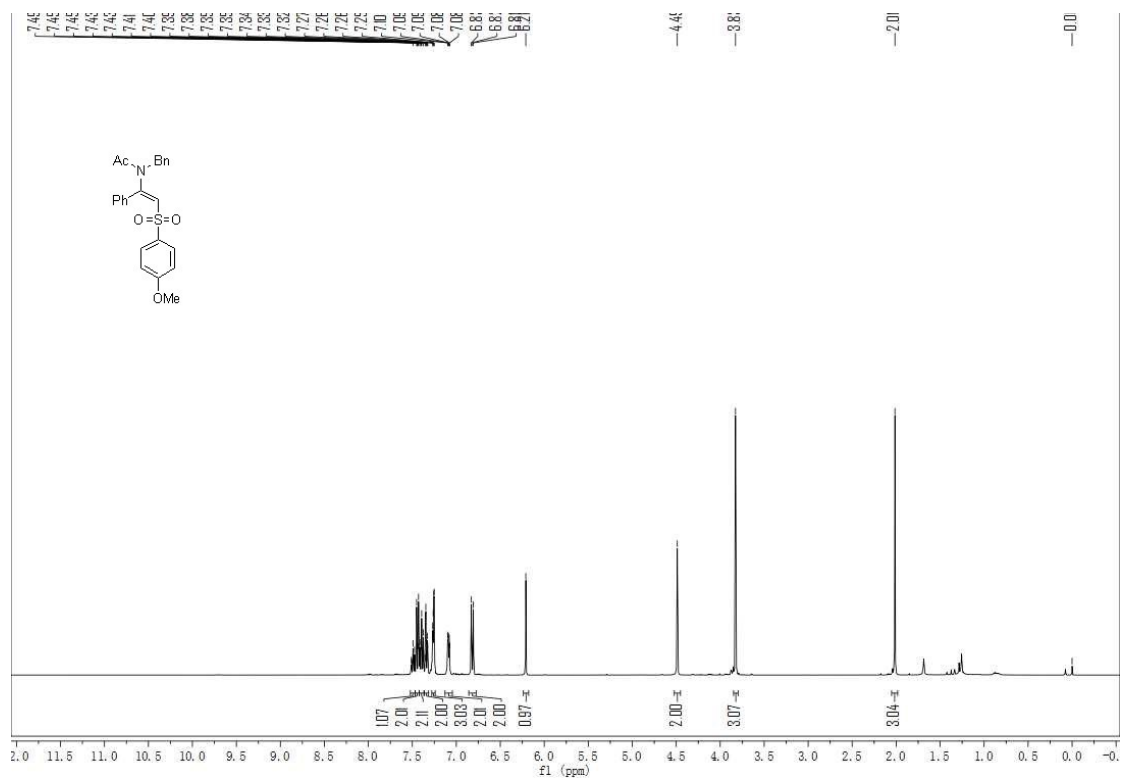
### <sup>1</sup>H NMR spectrum of 4aa



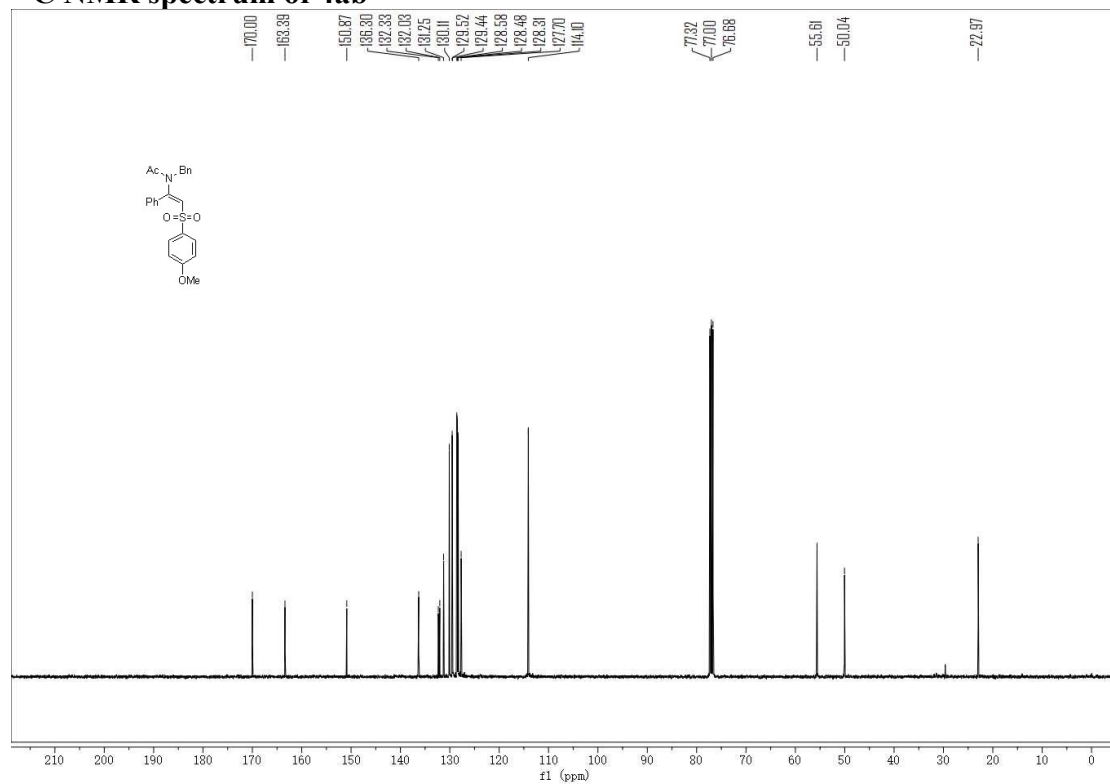
### <sup>13</sup>C NMR spectrum of 4aa



### <sup>1</sup>H NMR spectrum of 4ab

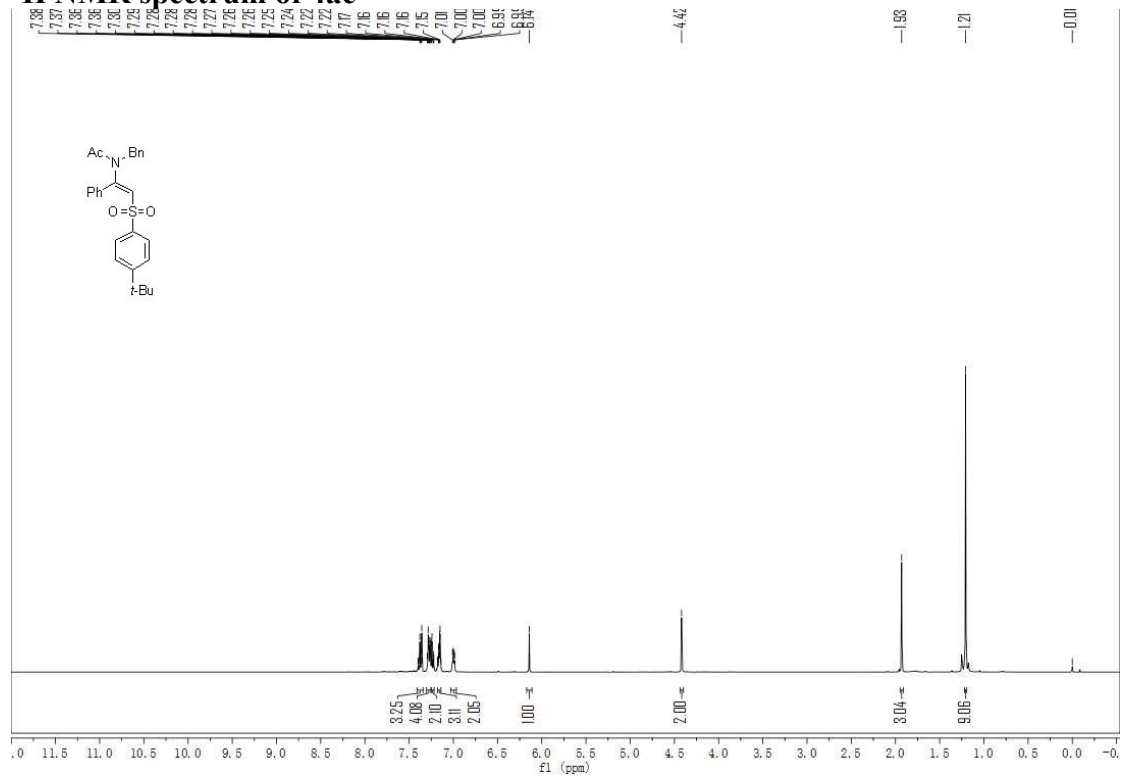


**<sup>13</sup>C NMR spectrum of 4ab**

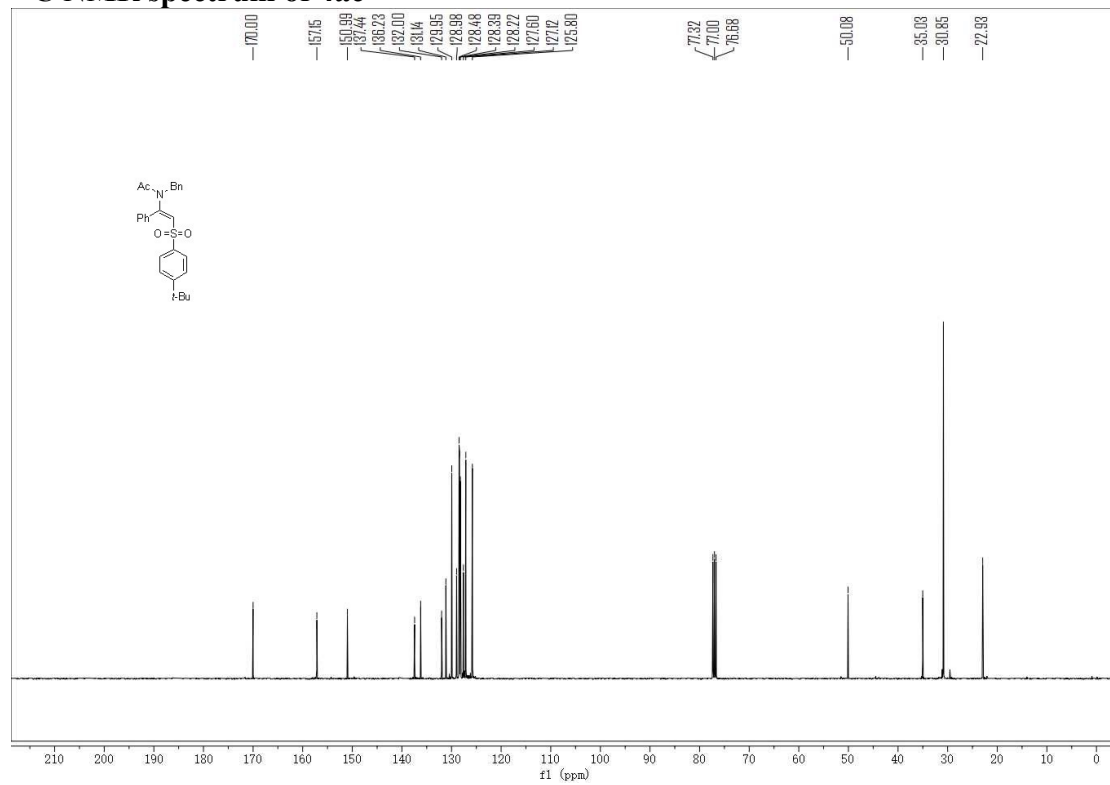




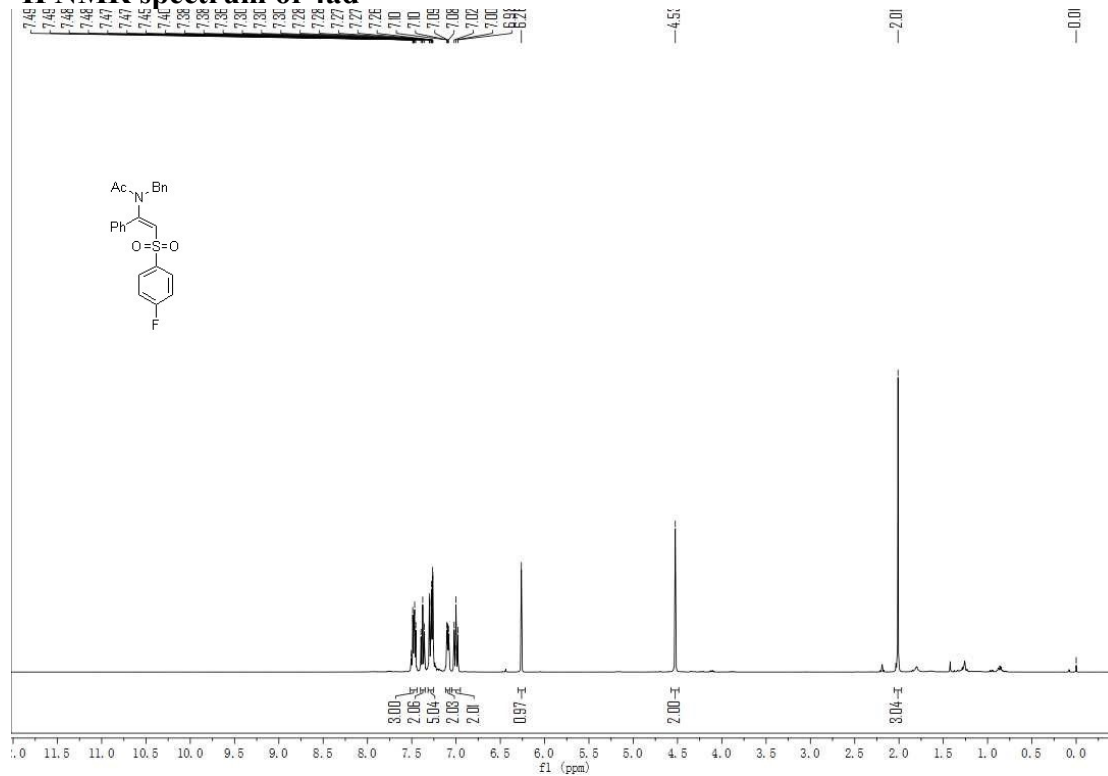
### <sup>1</sup>H NMR spectrum of 4ac



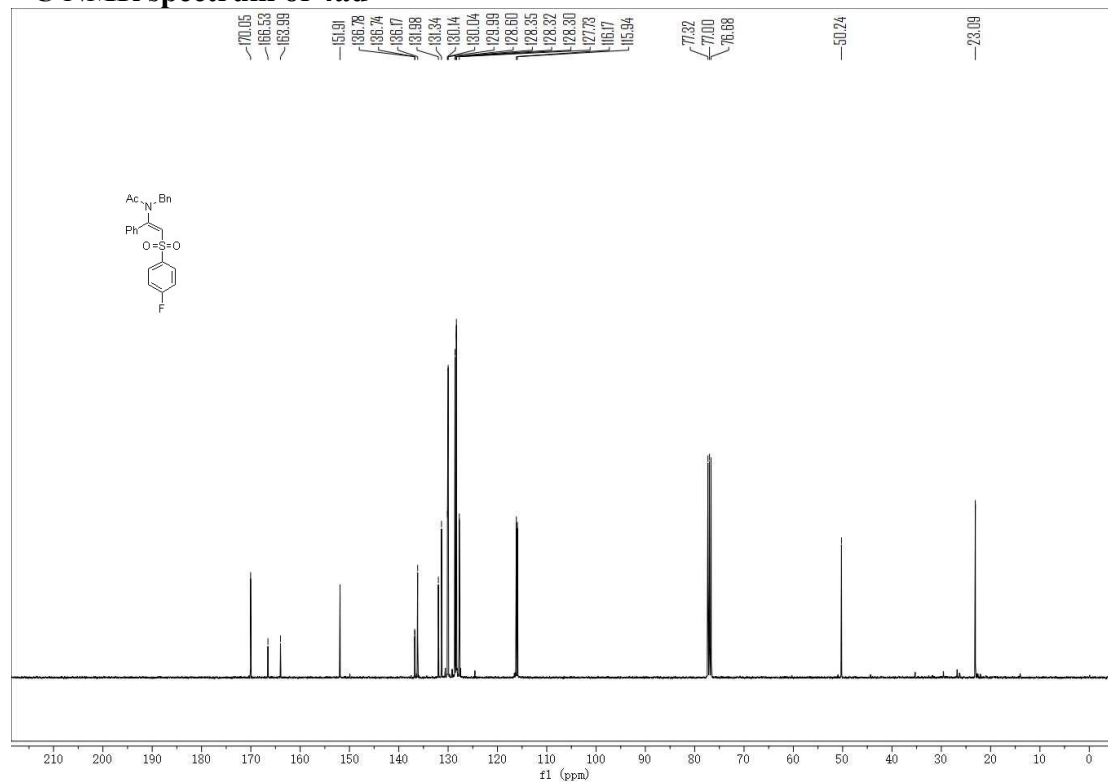
### <sup>13</sup>C NMR spectrum of 4ac



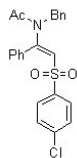
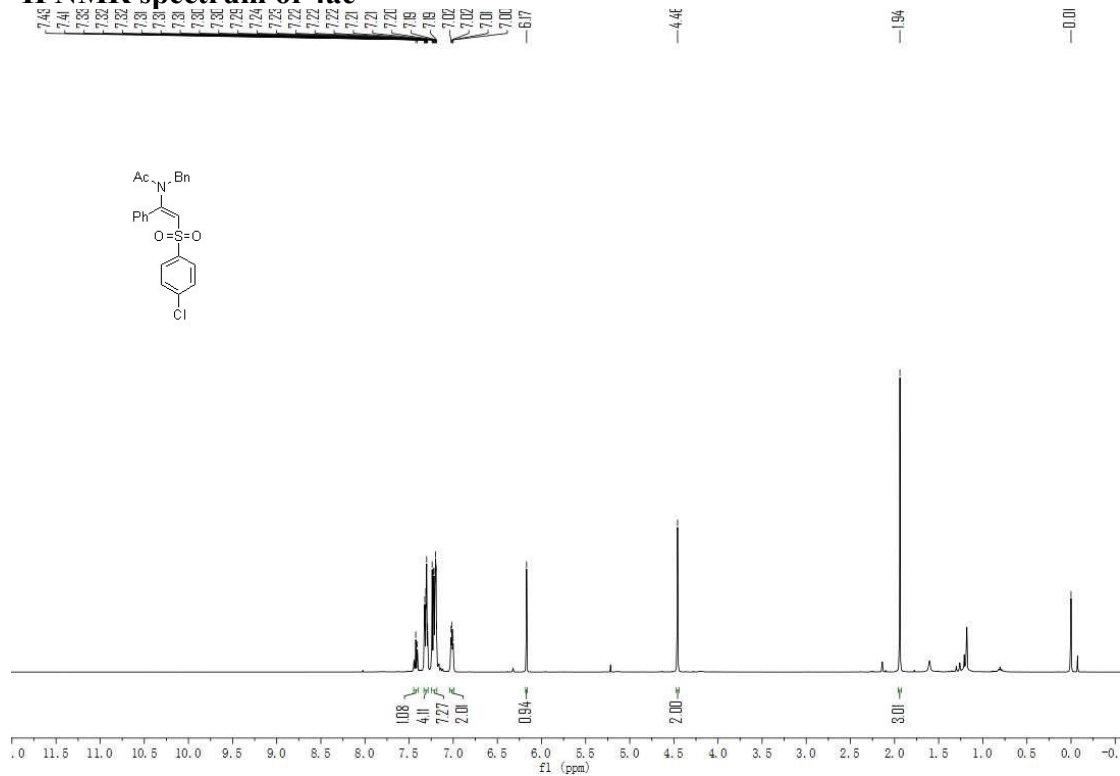
### <sup>1</sup>H NMR spectrum of 4ad



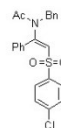
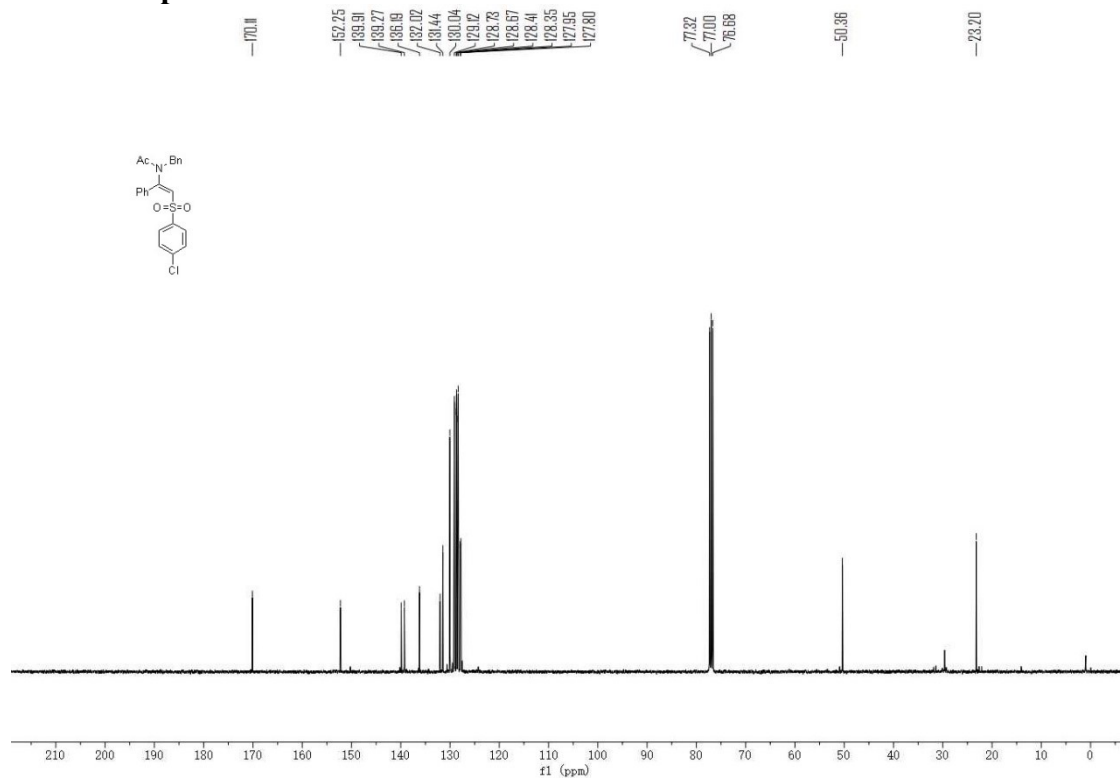
### <sup>13</sup>C NMR spectrum of 4ad



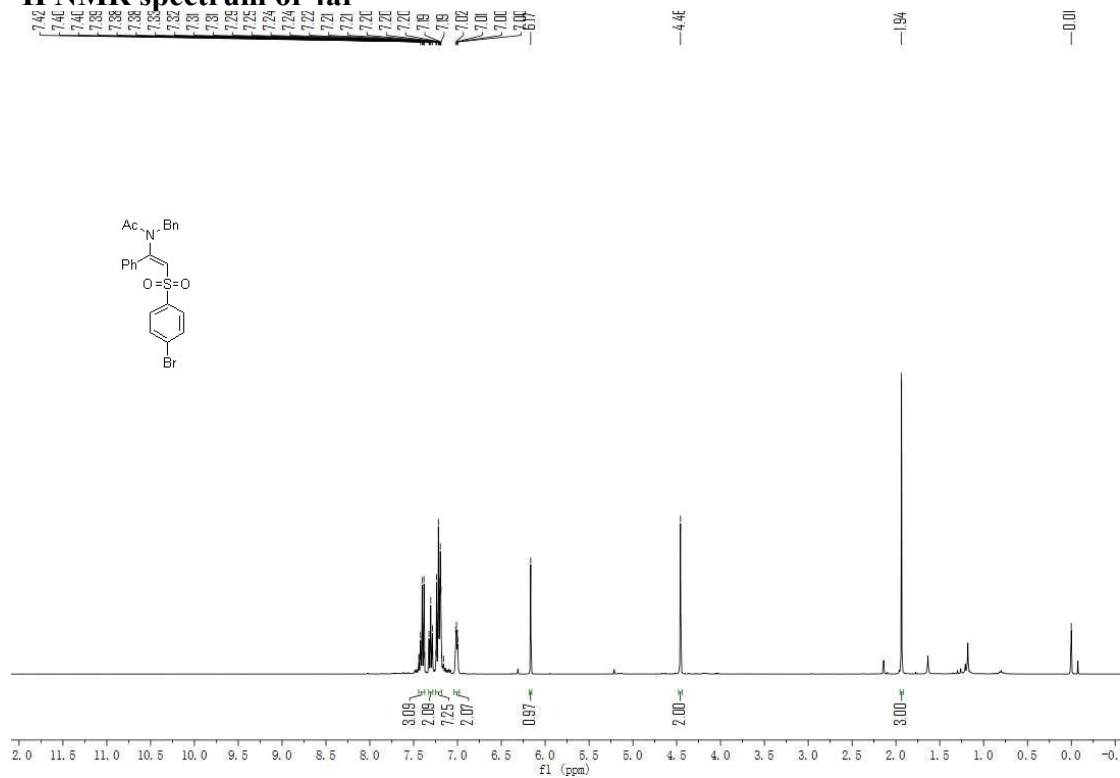
### <sup>1</sup>H NMR spectrum of 4ae



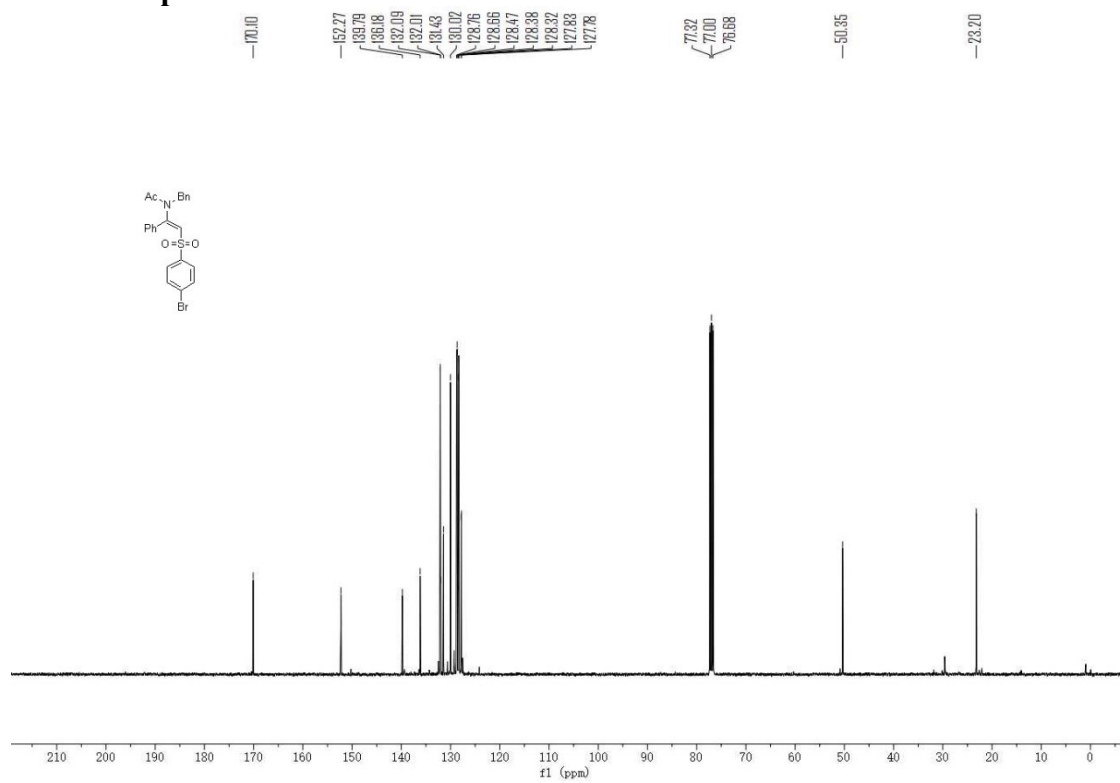
### <sup>13</sup>C NMR spectrum of 4ae



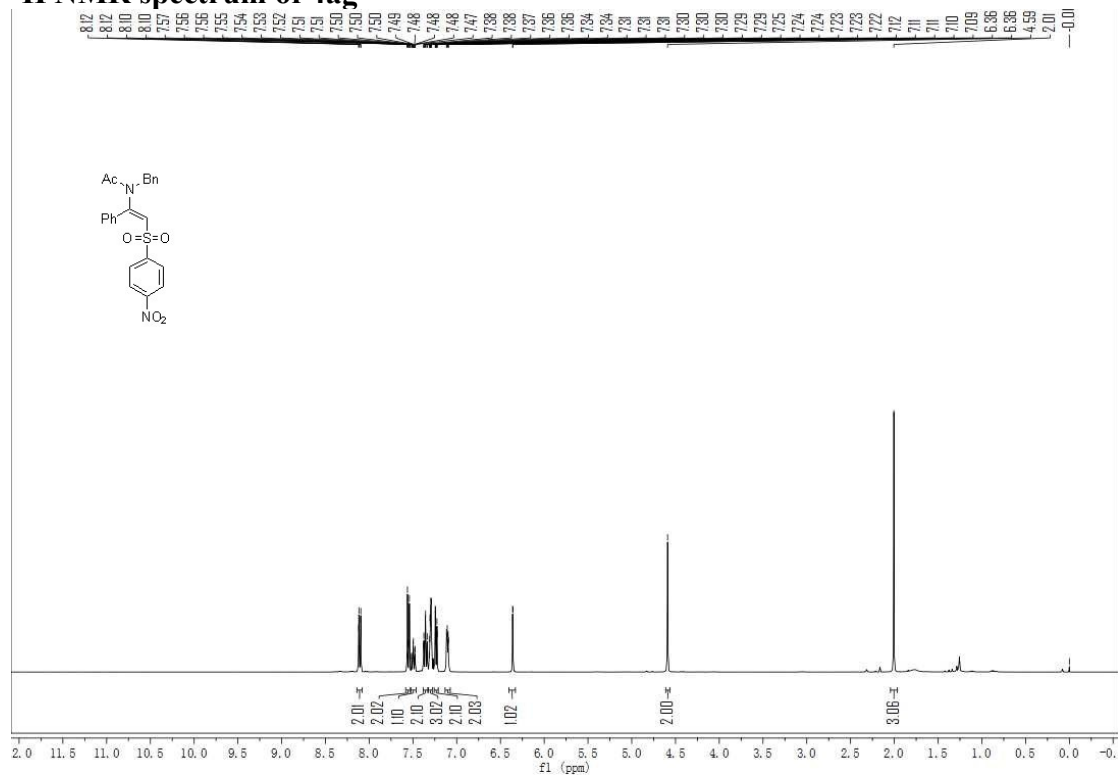
### <sup>1</sup>H NMR spectrum of 4af



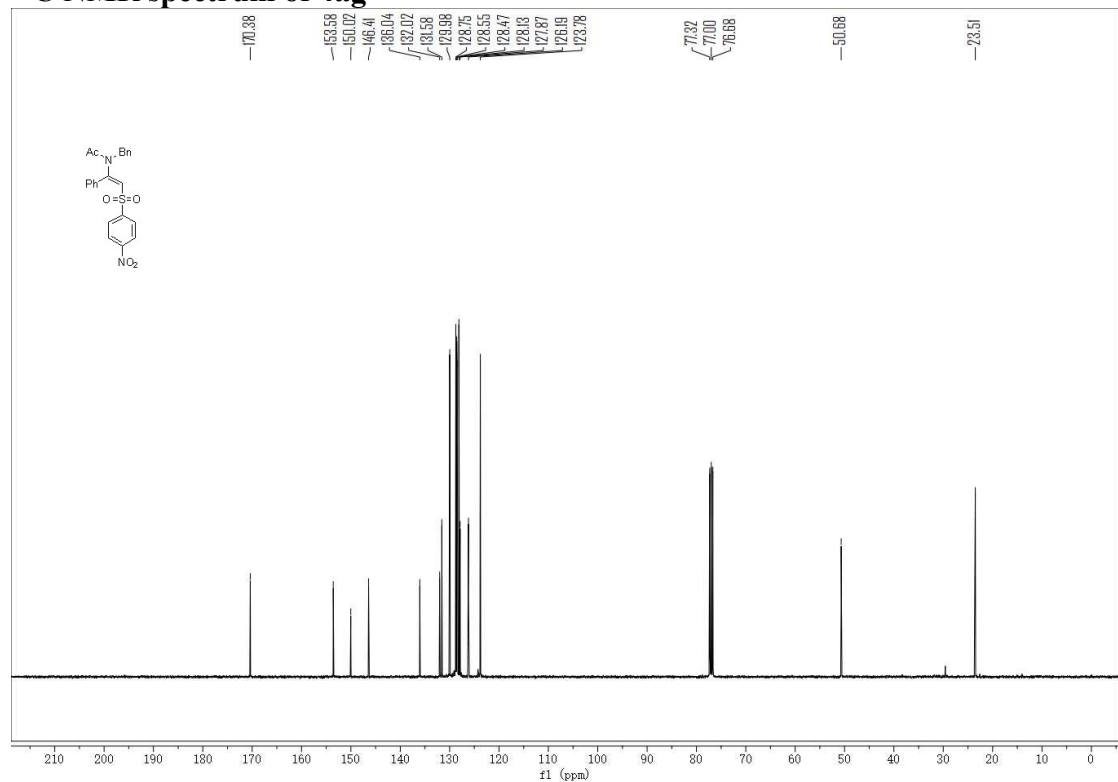
### <sup>13</sup>C NMR spectrum of 4af



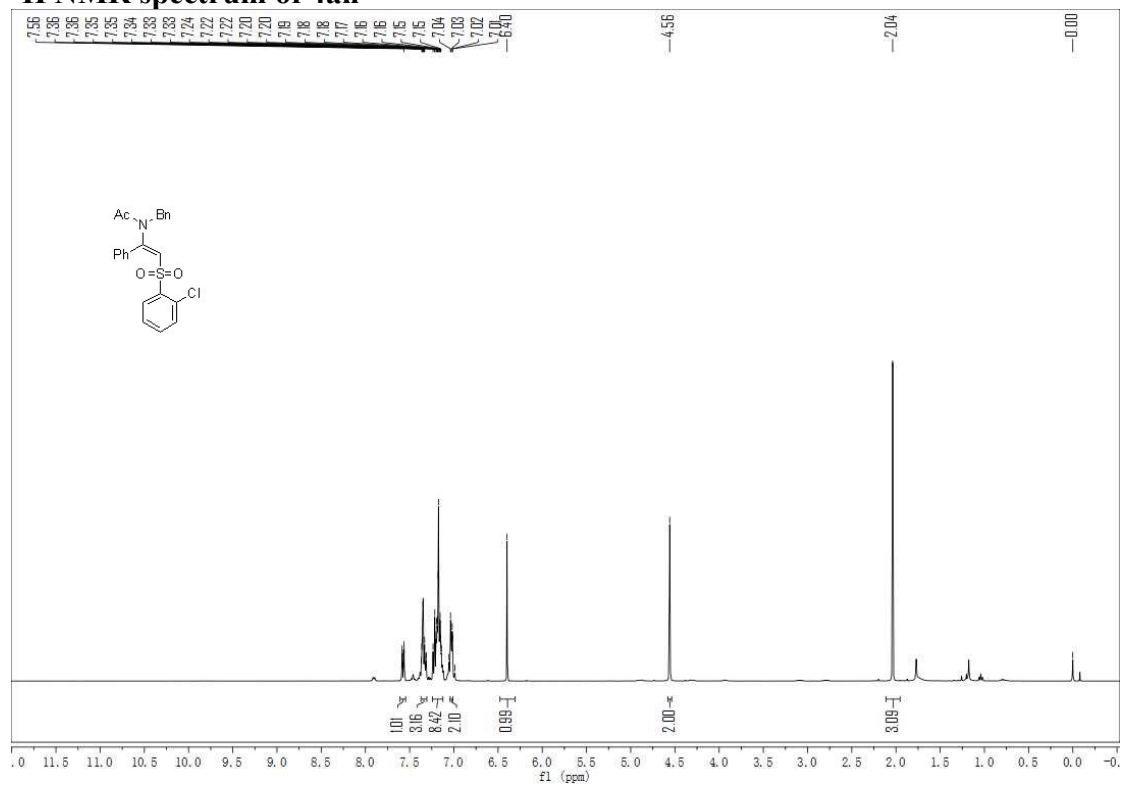
### <sup>1</sup>H NMR spectrum of 4ag



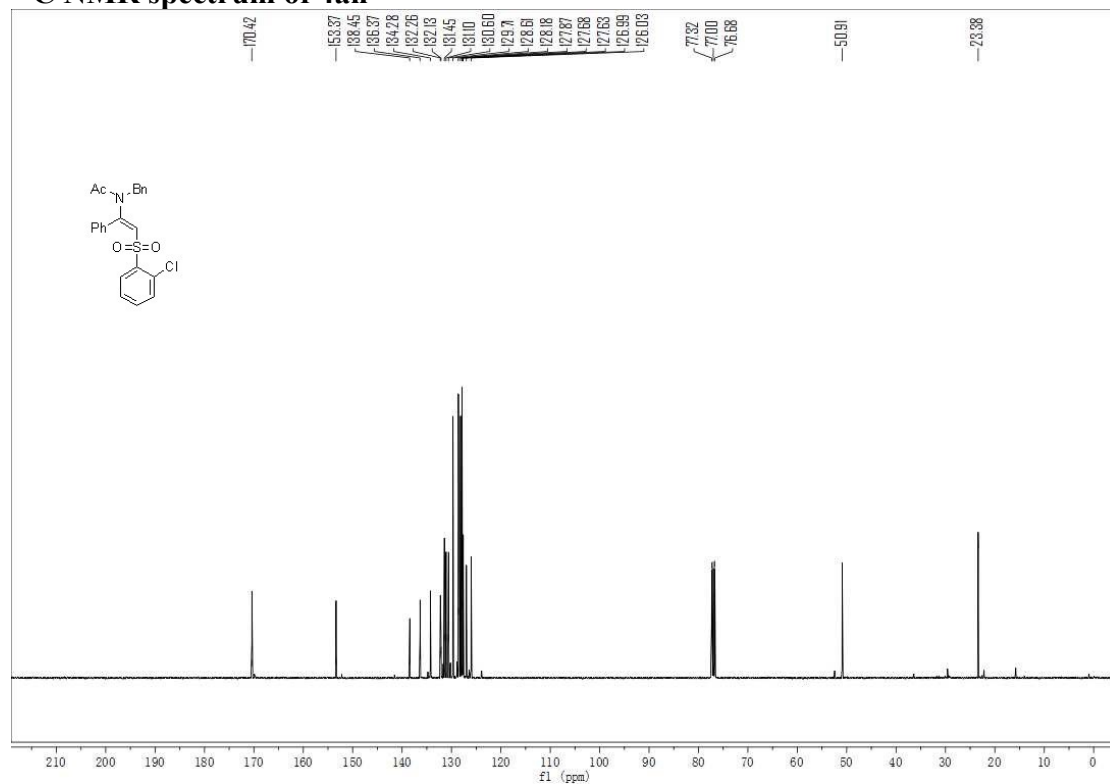
### <sup>13</sup>C NMR spectrum of 4ag



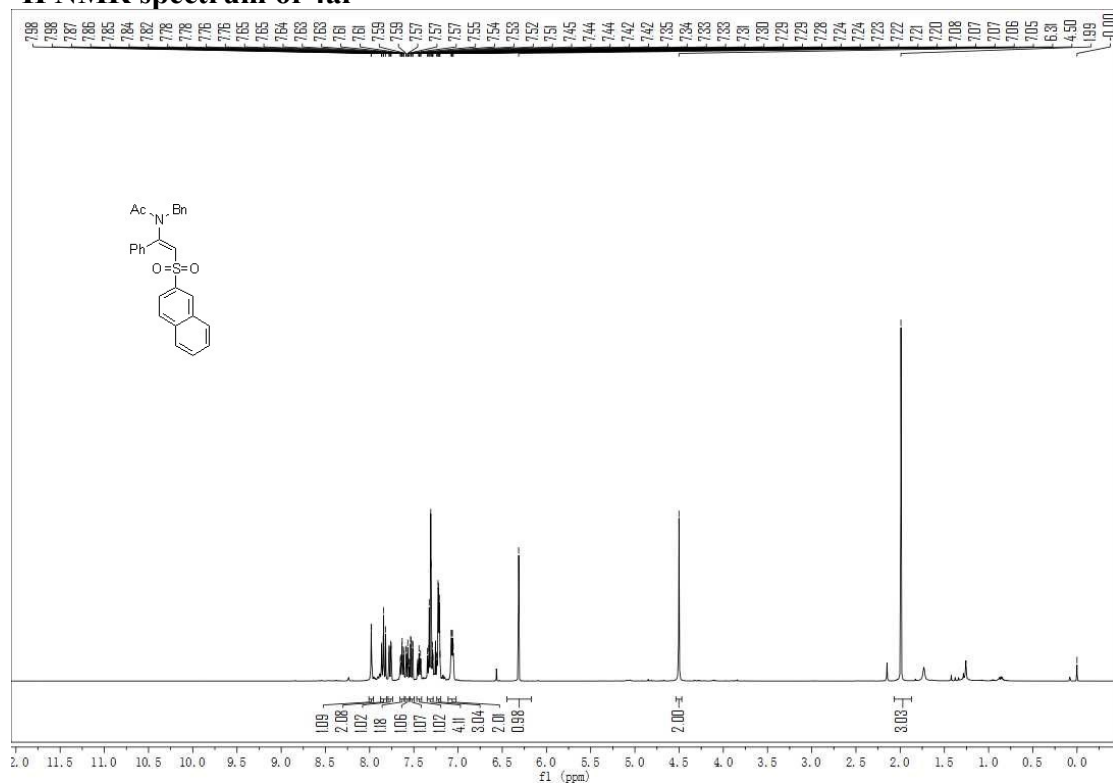
### <sup>1</sup>H NMR spectrum of 4ah



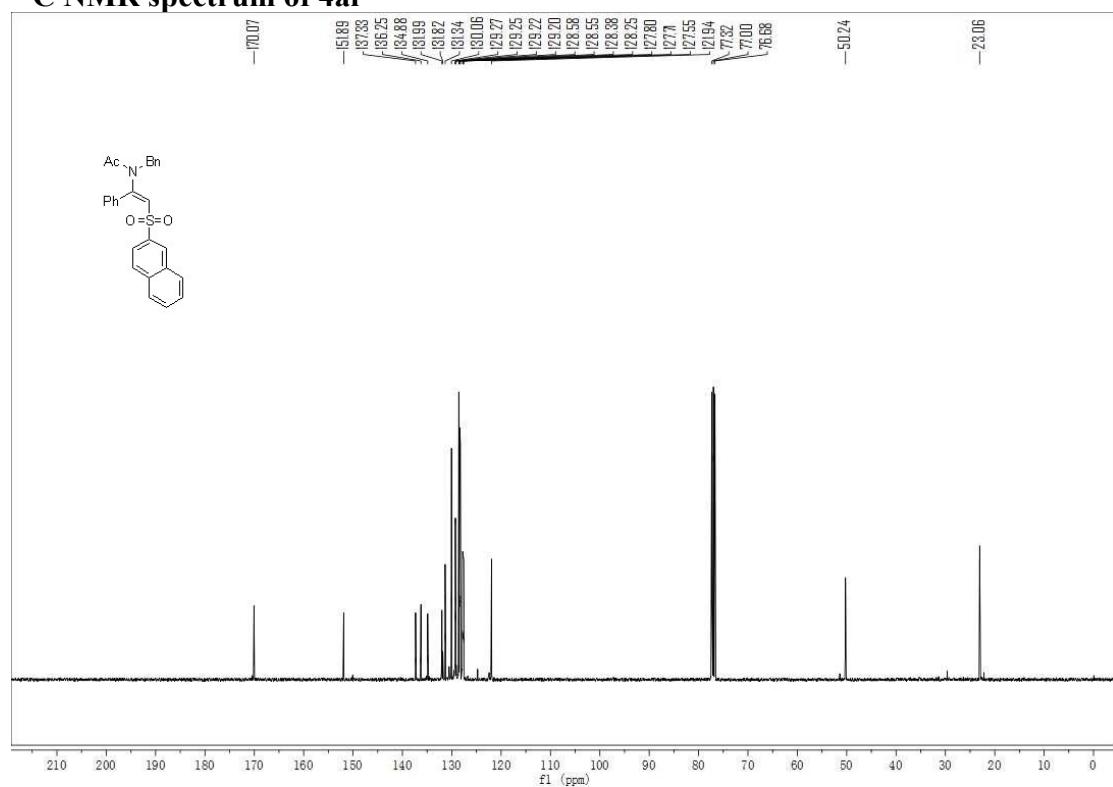
### <sup>13</sup>C NMR spectrum of 4ah



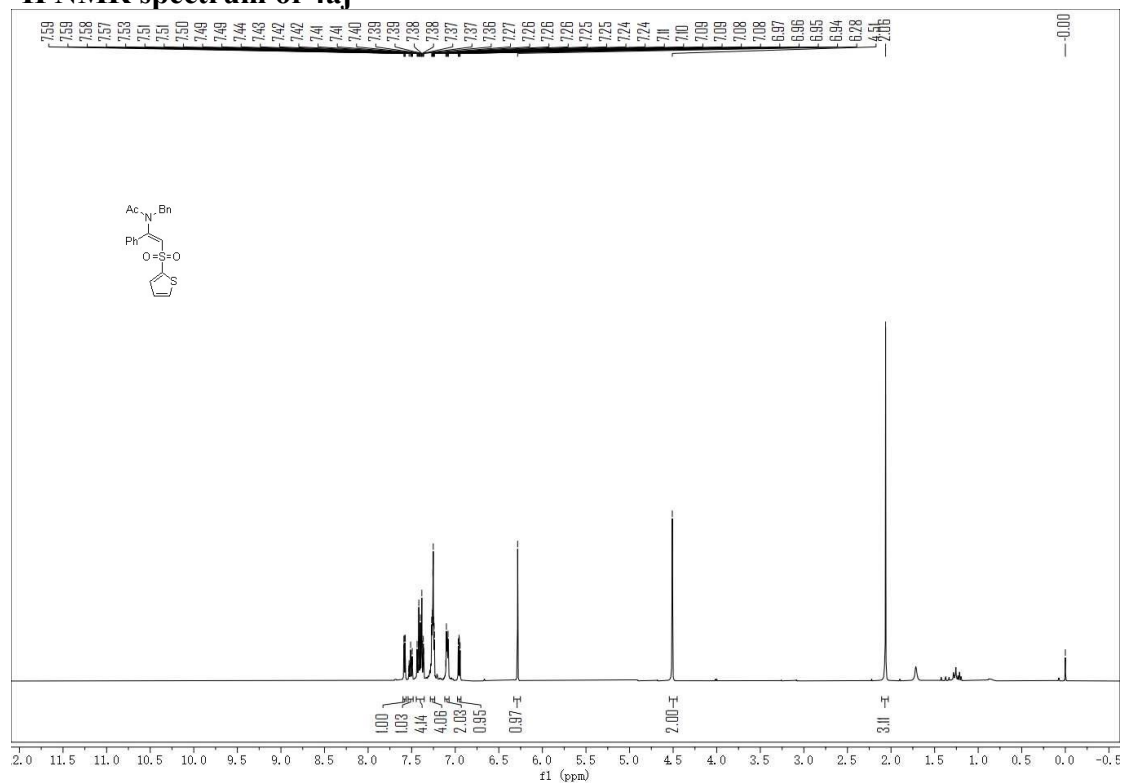
### <sup>1</sup>H NMR spectrum of 4ai



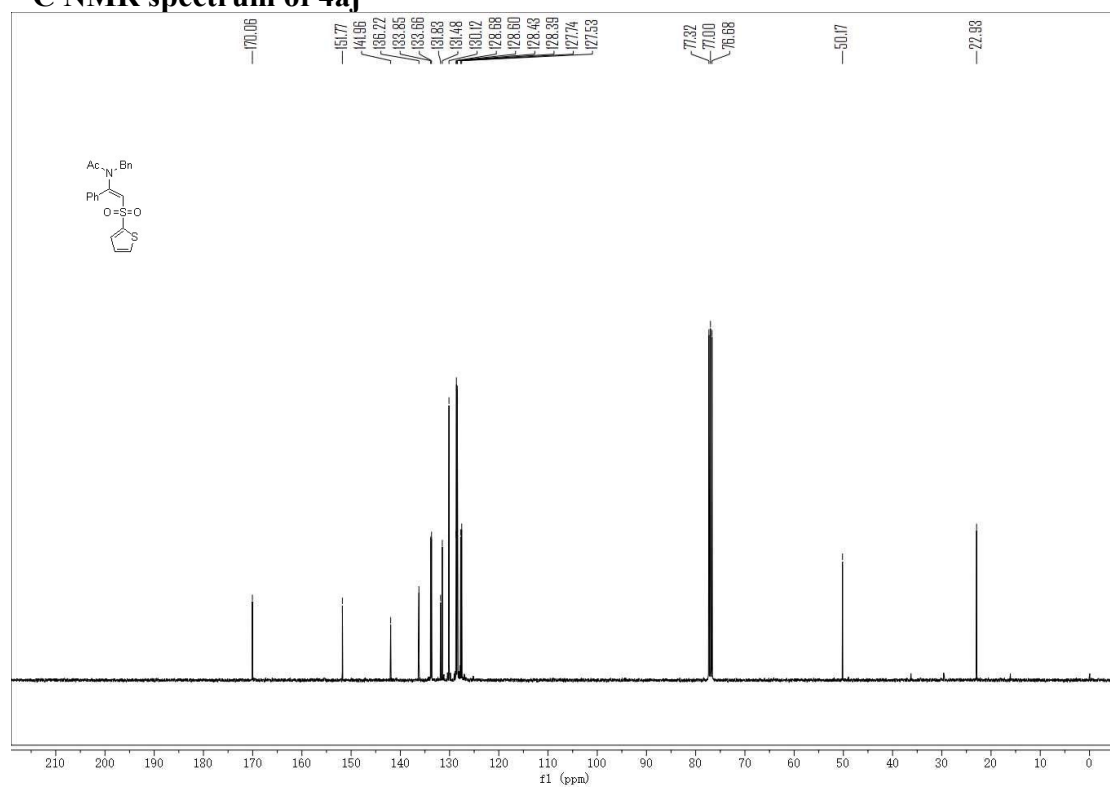
### <sup>13</sup>C NMR spectrum of 4ai



### <sup>1</sup>H NMR spectrum of 4aj

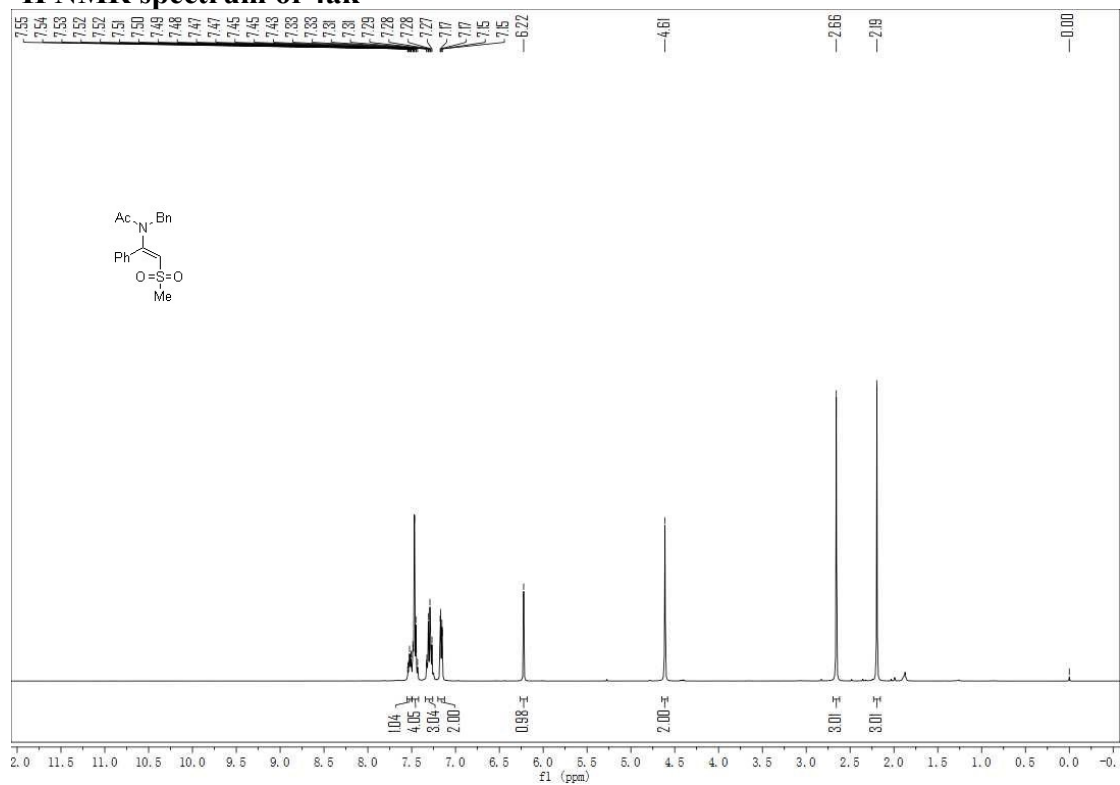


### <sup>13</sup>C NMR spectrum of 4aj

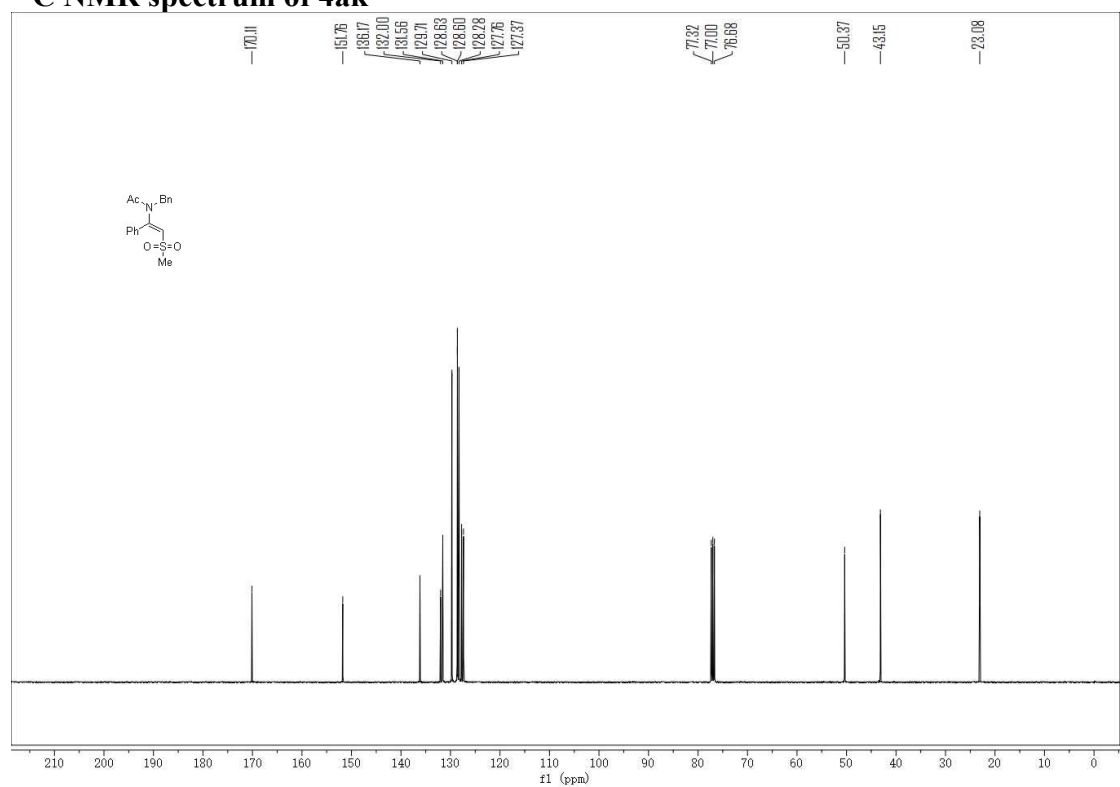




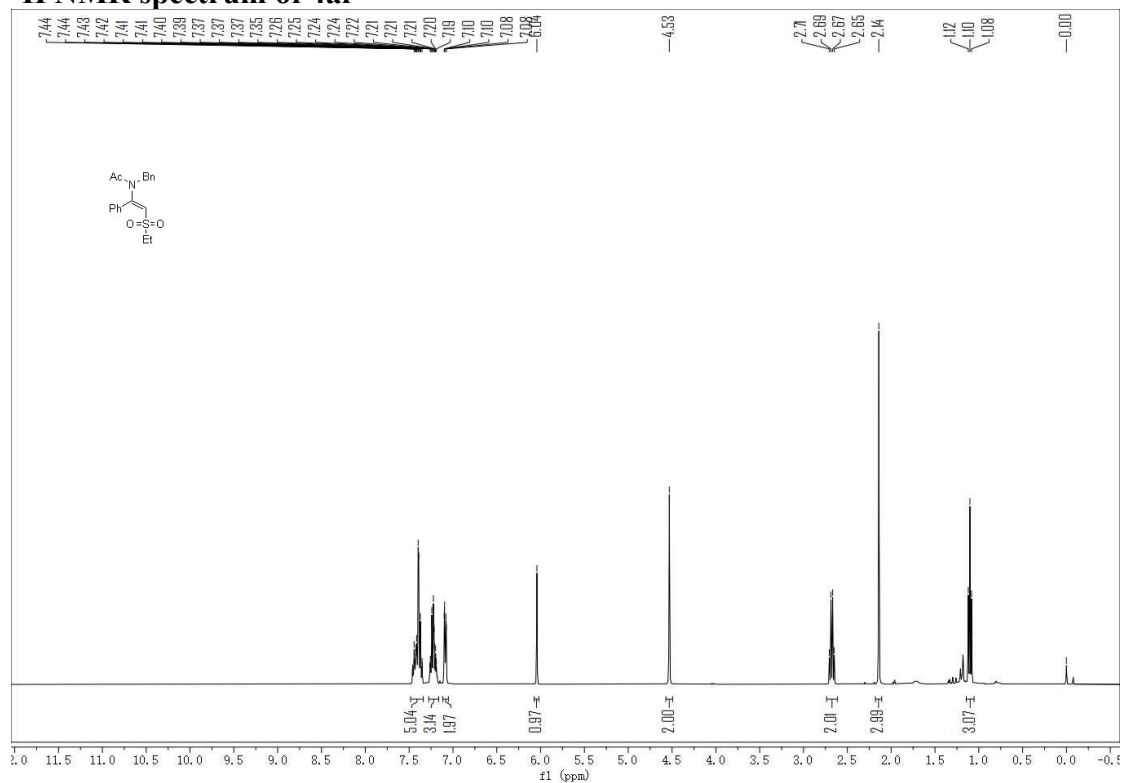
### <sup>1</sup>H NMR spectrum of 4ak



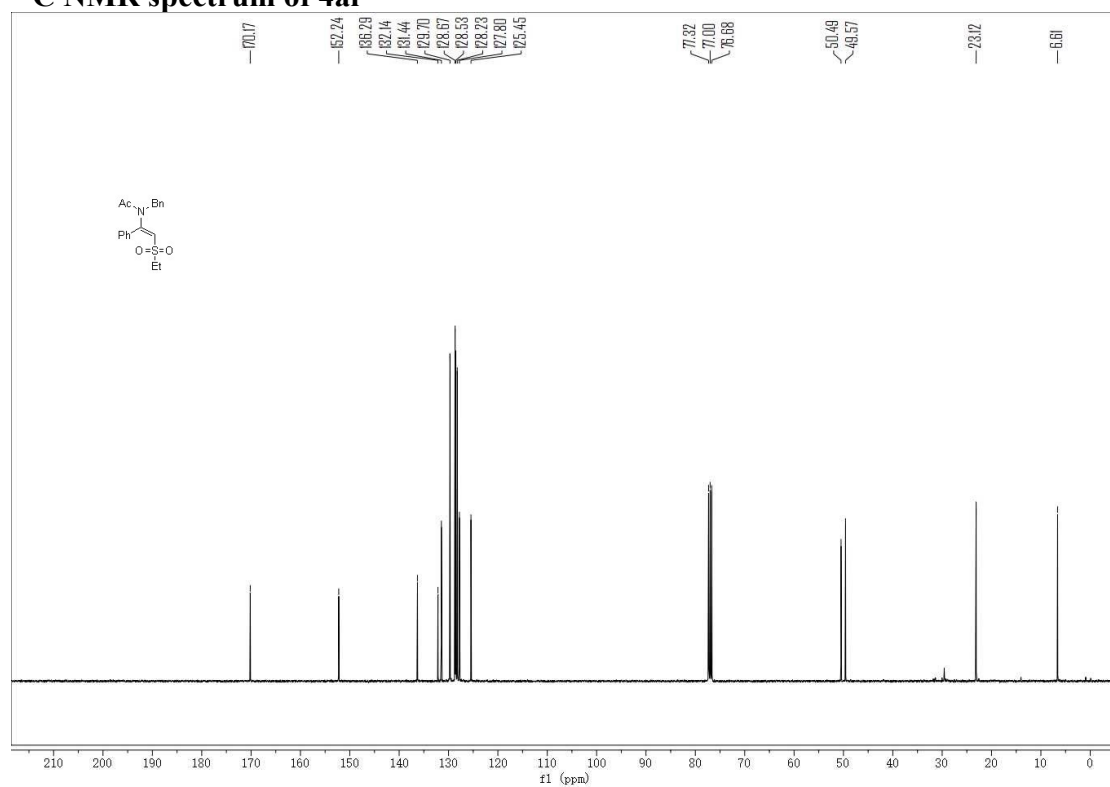
### <sup>13</sup>C NMR spectrum of 4ak



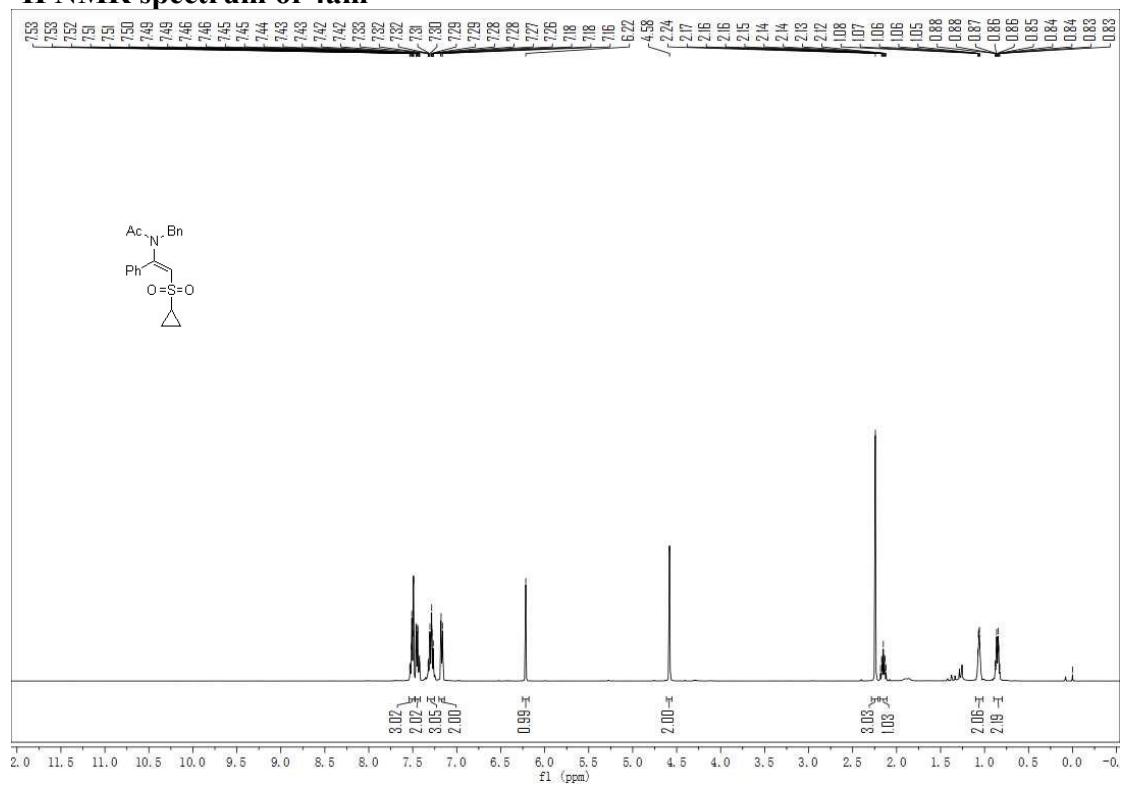
### <sup>1</sup>H NMR spectrum of 4al



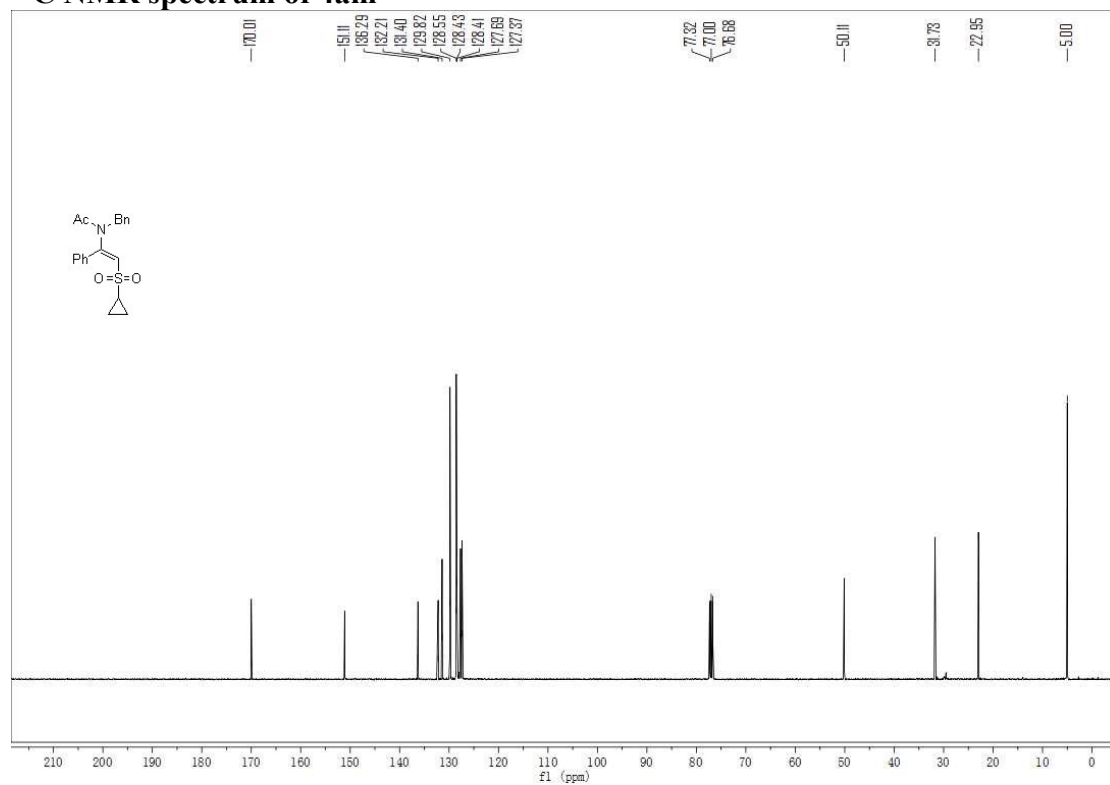
### <sup>13</sup>C NMR spectrum of 4al



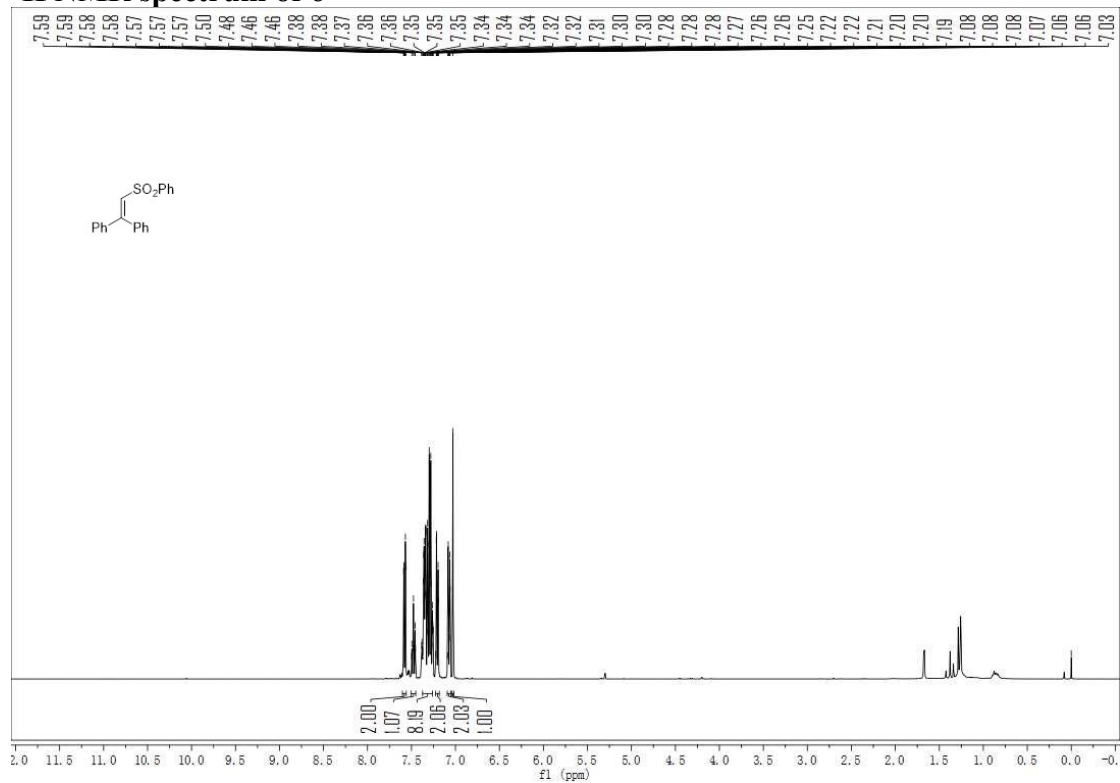
### <sup>1</sup>H NMR spectrum of 4am



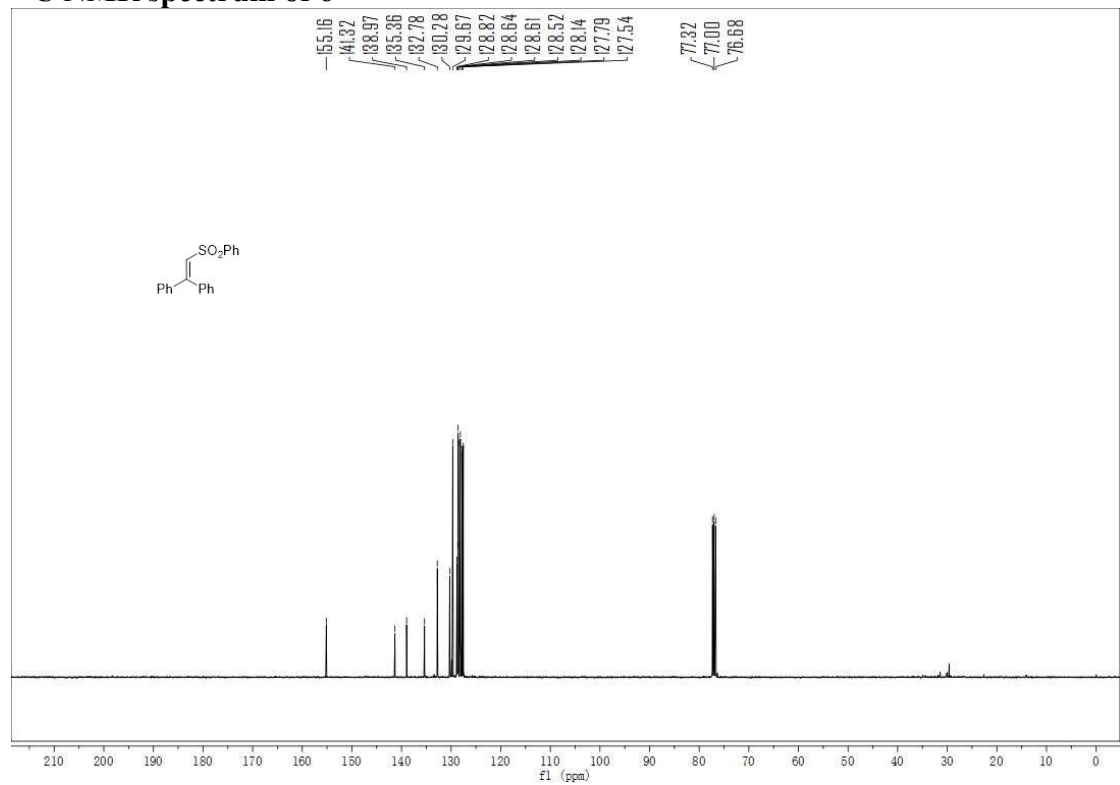
### <sup>13</sup>C NMR spectrum of 4am



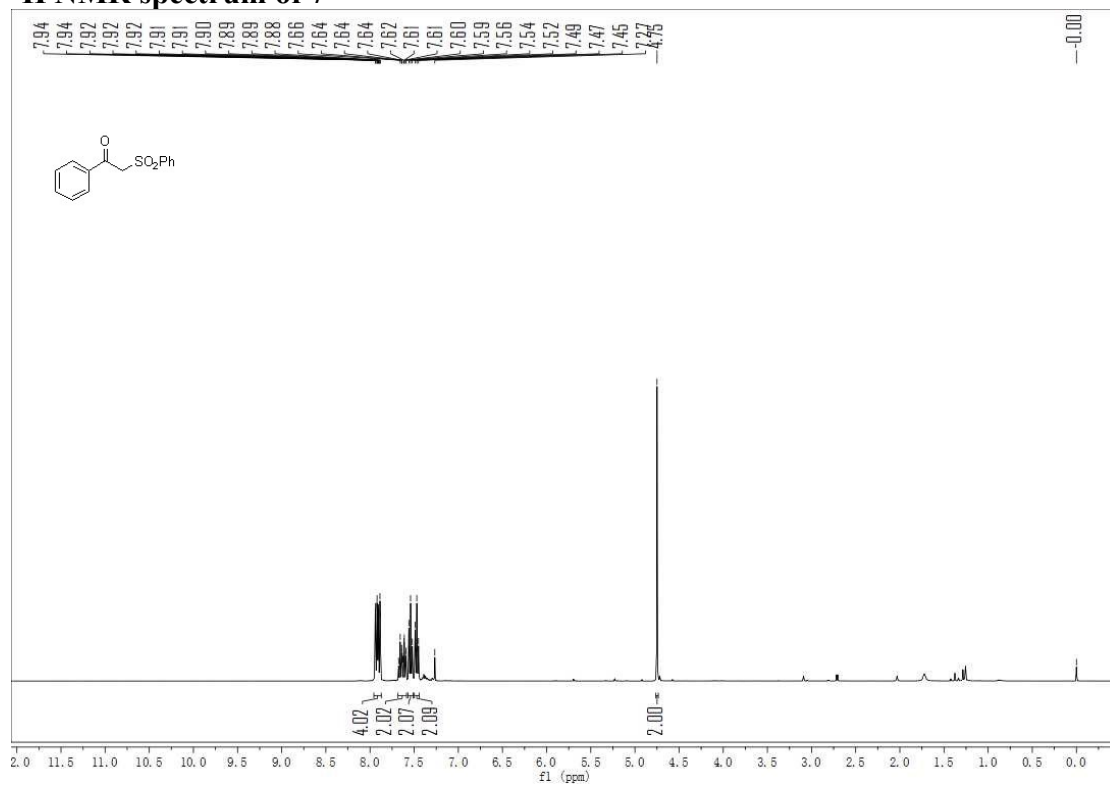
### <sup>1</sup>H NMR spectrum of 6



### <sup>13</sup>C NMR spectrum of 6



### <sup>1</sup>H NMR spectrum of 7



### <sup>13</sup>C NMR spectrum of 7

