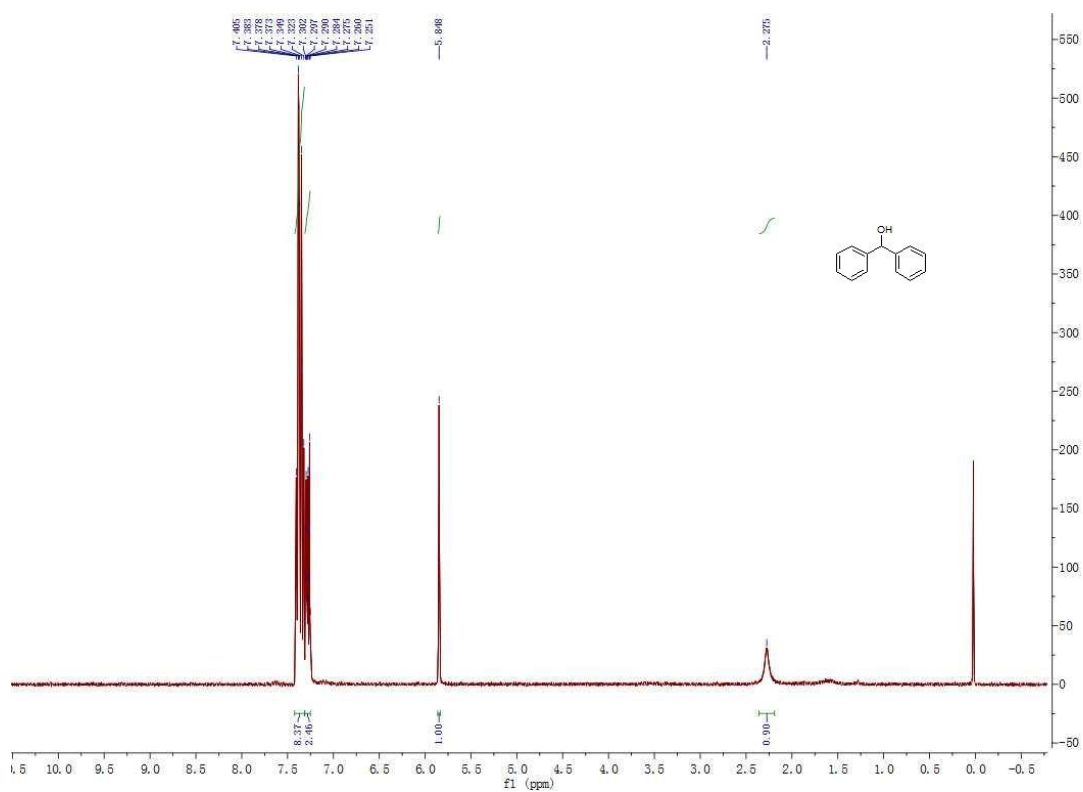


# Supporting Information

## Base-free efficient approach to carbinol derivatives through palladium-catalyzed addition of aryltriolborates to aldehydes

Kun Hu, Pengqing Ye, Qianqian Zhen, Xinrong Yao, Tong Xu, Yinlin Shao\*



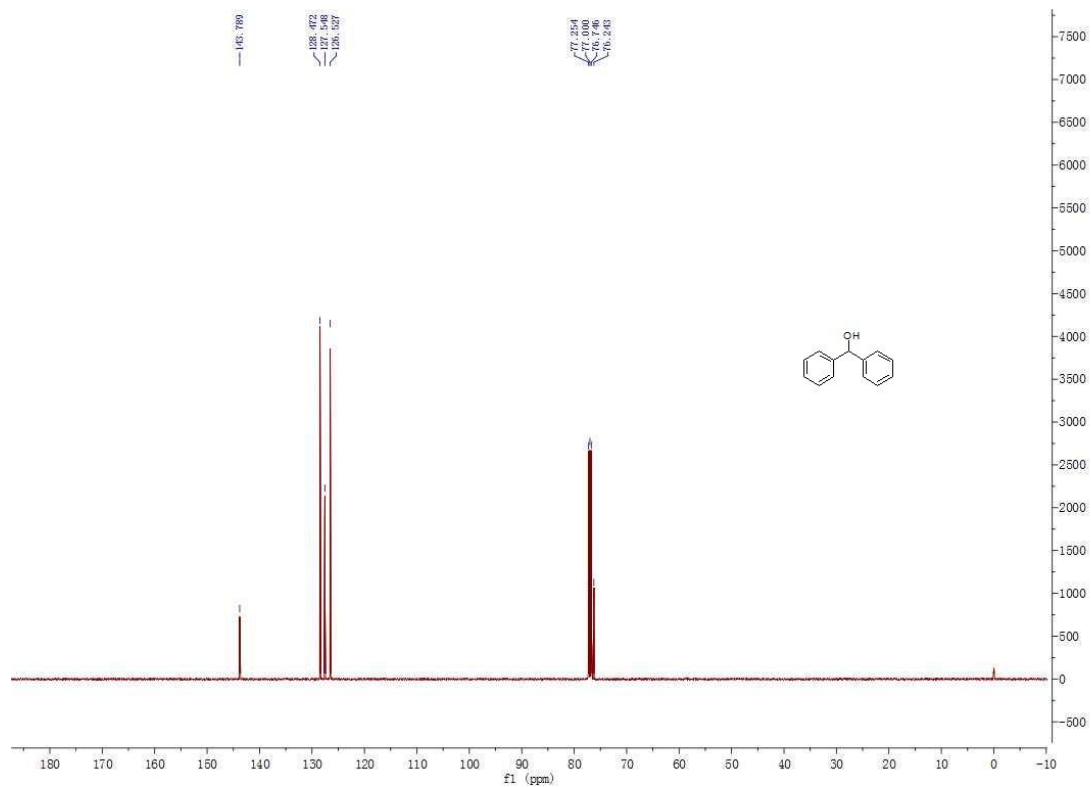
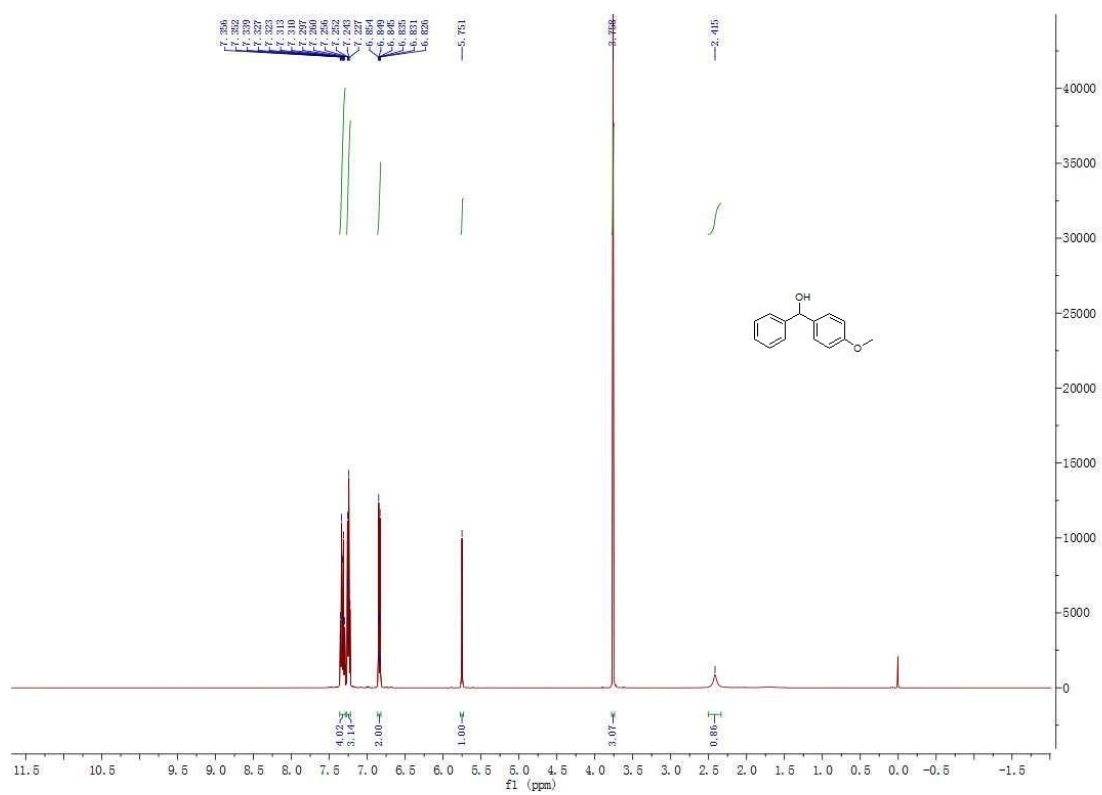
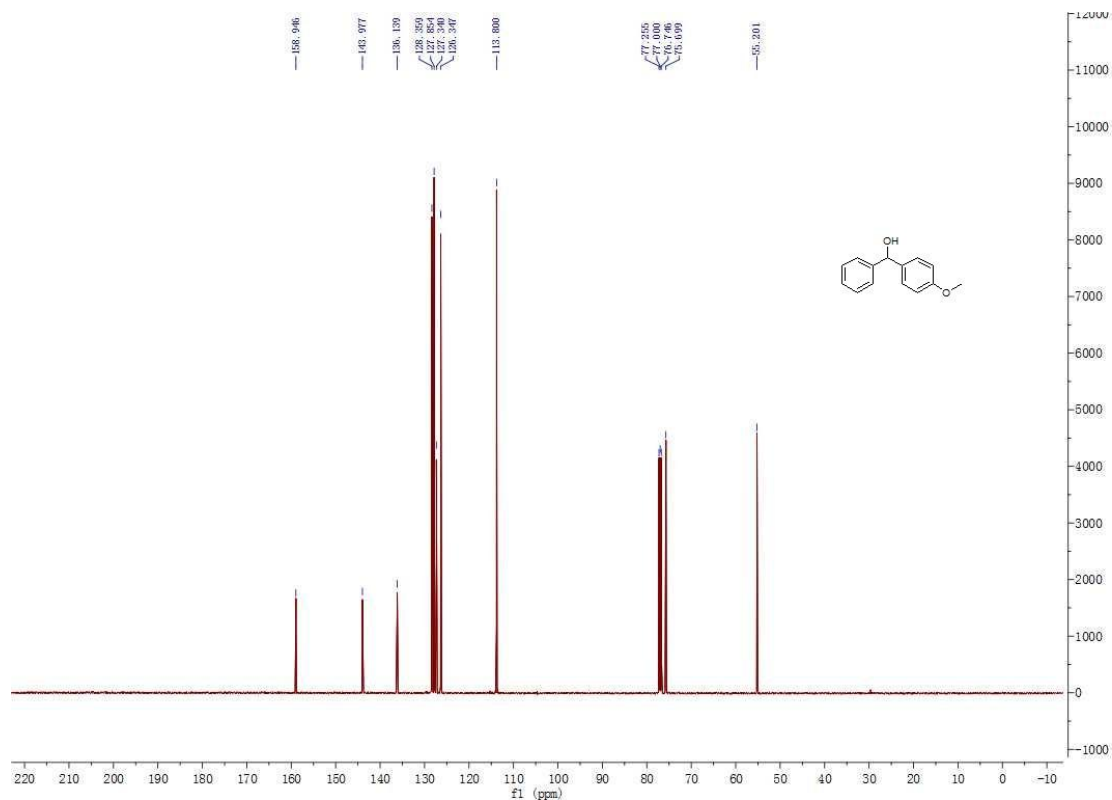
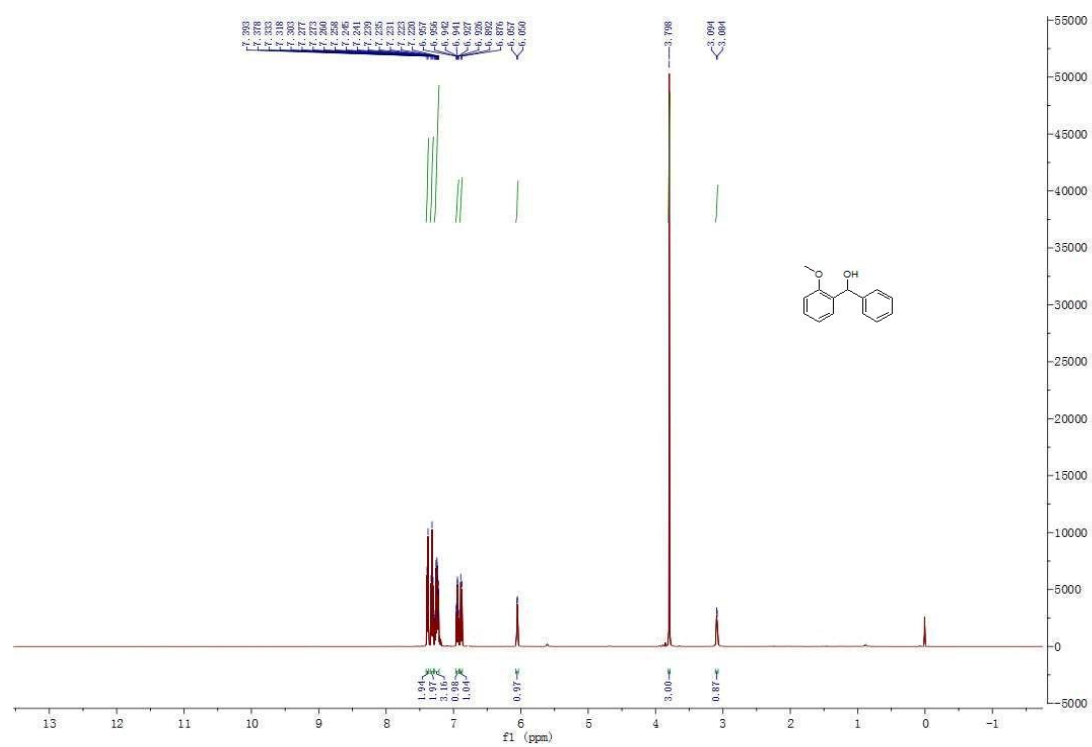


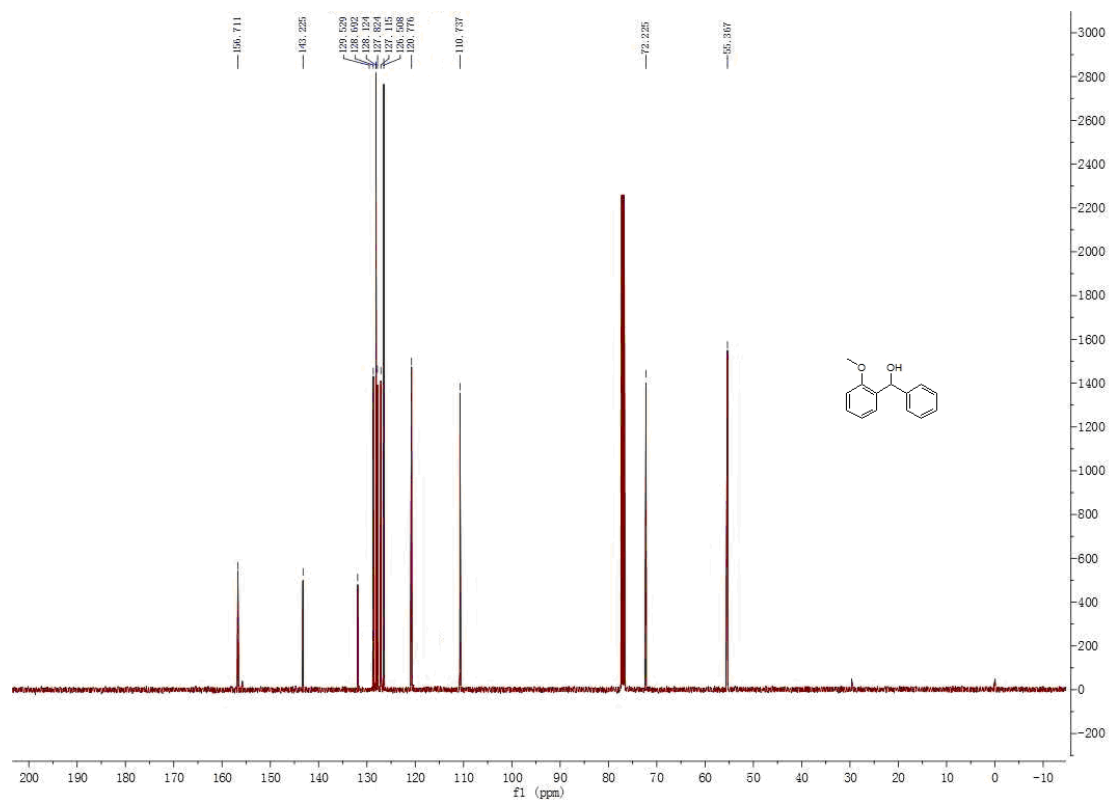
Figure S1.  $^1\text{H}$  NMR of **3a** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3a** (125 MHz,  $\text{CDCl}_3$ ).



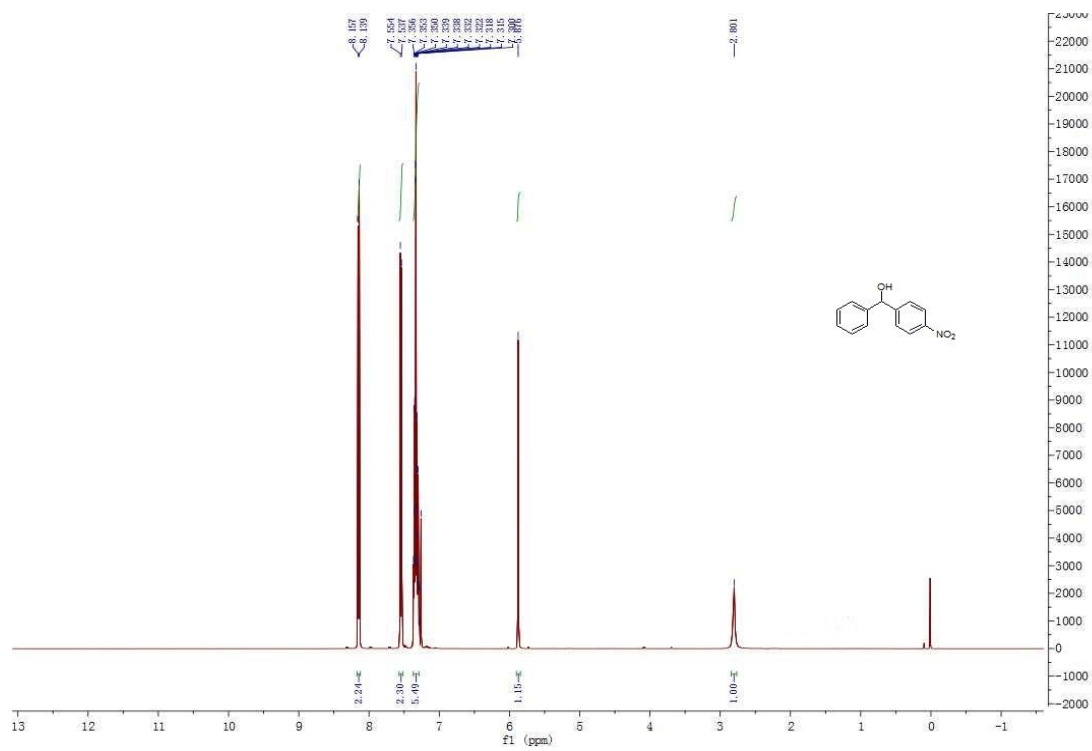


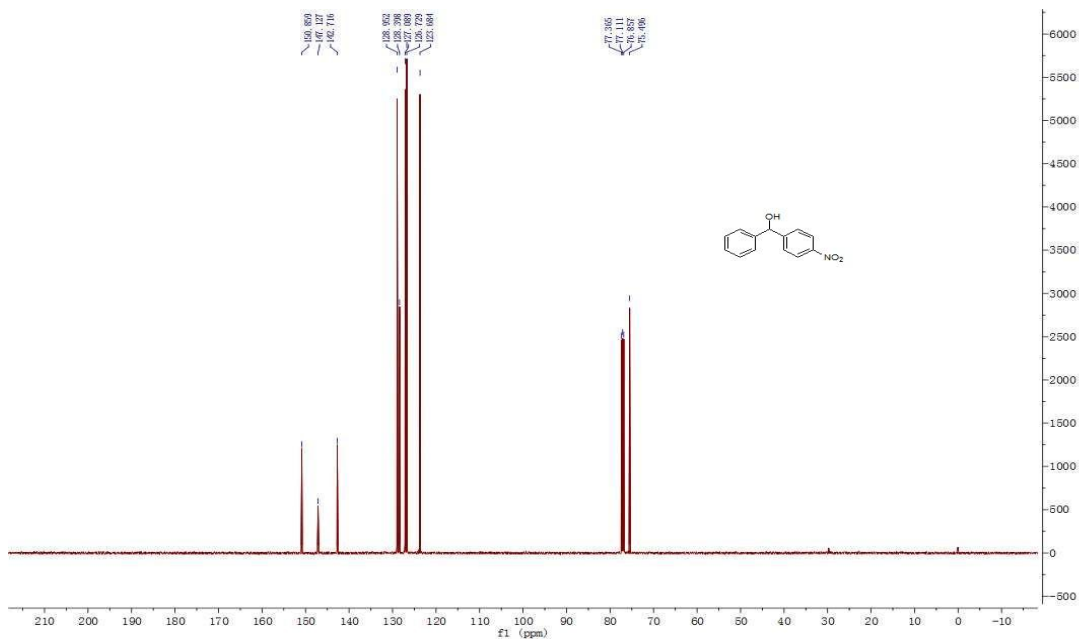
**Figure S2.**  $^1\text{H}$  NMR of **3b** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3b** (125 MHz,  $\text{CDCl}_3$ ).



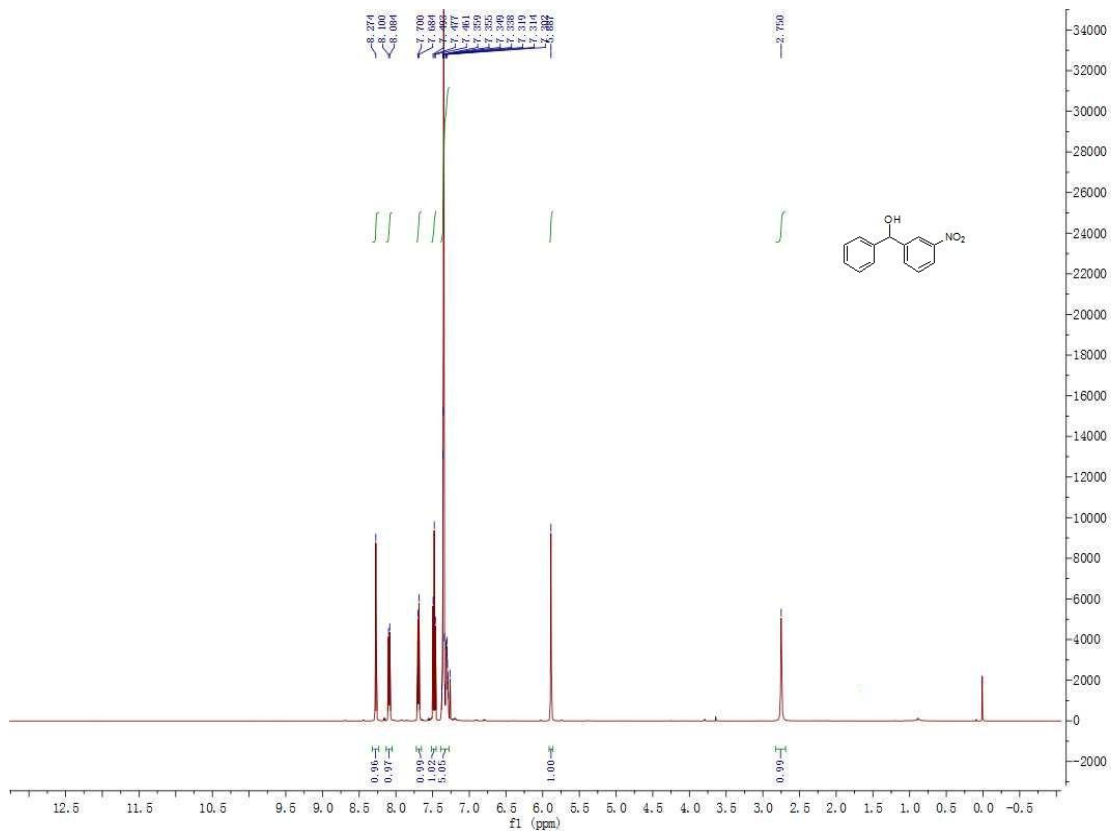


**Figure S3.**  $^1\text{H}$  NMR of **3c** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3c** (125 MHz,  $\text{CDCl}_3$ ).





**Figure S4.**  $^1\text{H}$  NMR of **3d** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3d** (125 MHz,  $\text{CDCl}_3$ ).



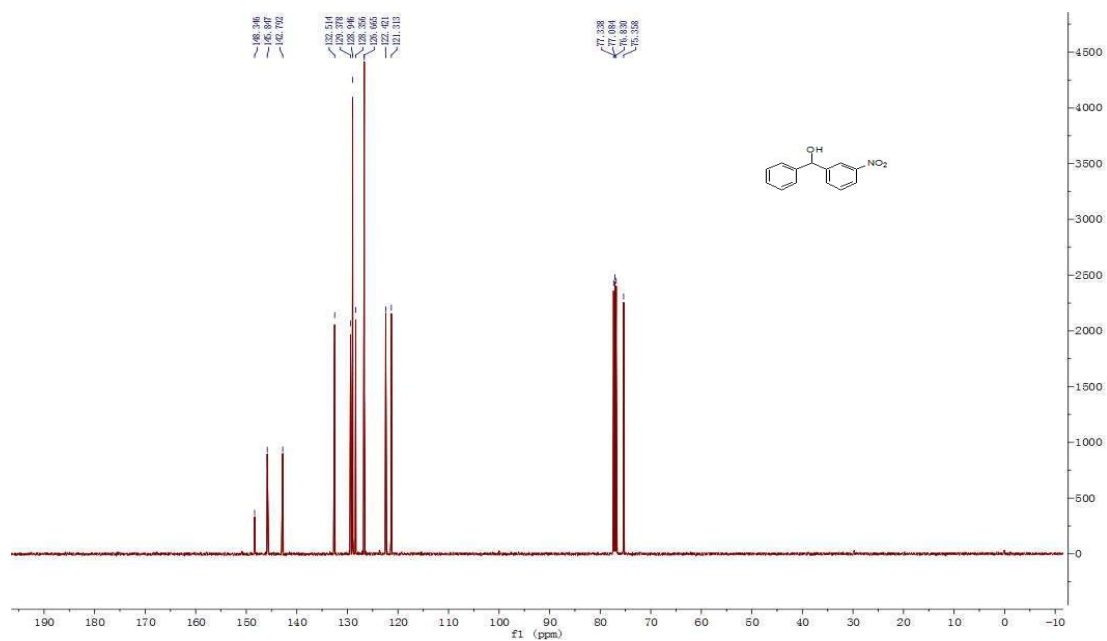
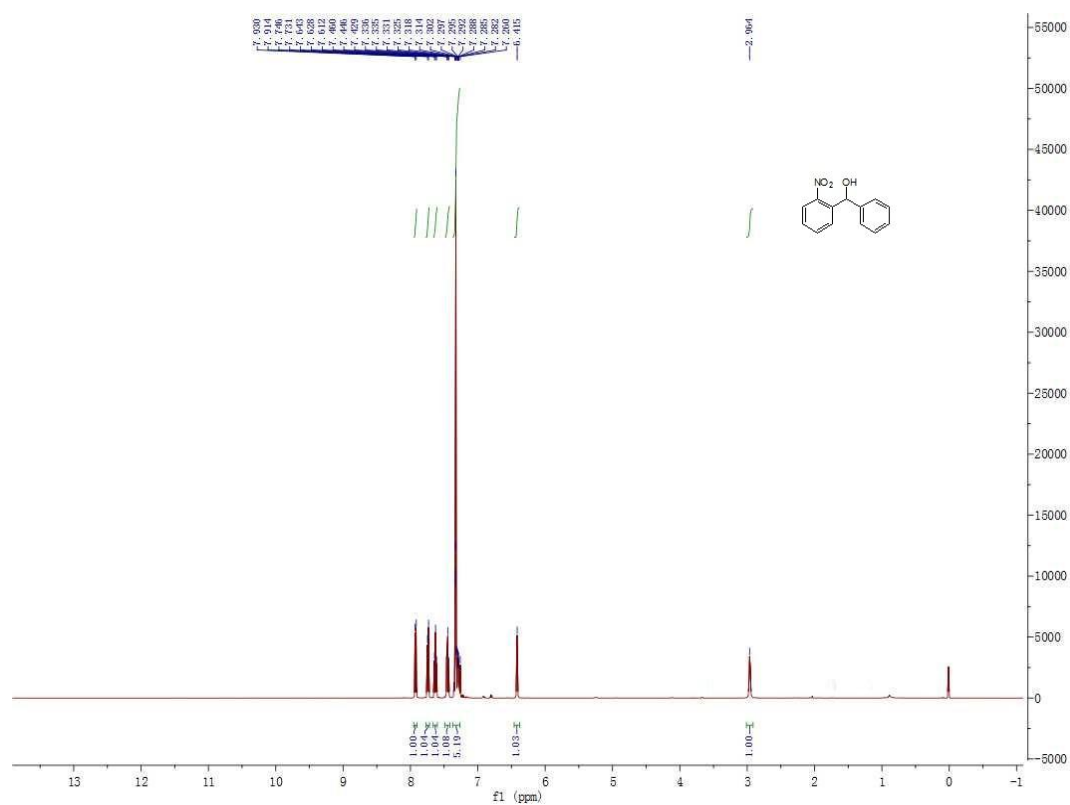


Figure S5. <sup>1</sup>H NMR of **3e** (500 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3e** (125 MHz, CDCl<sub>3</sub>).



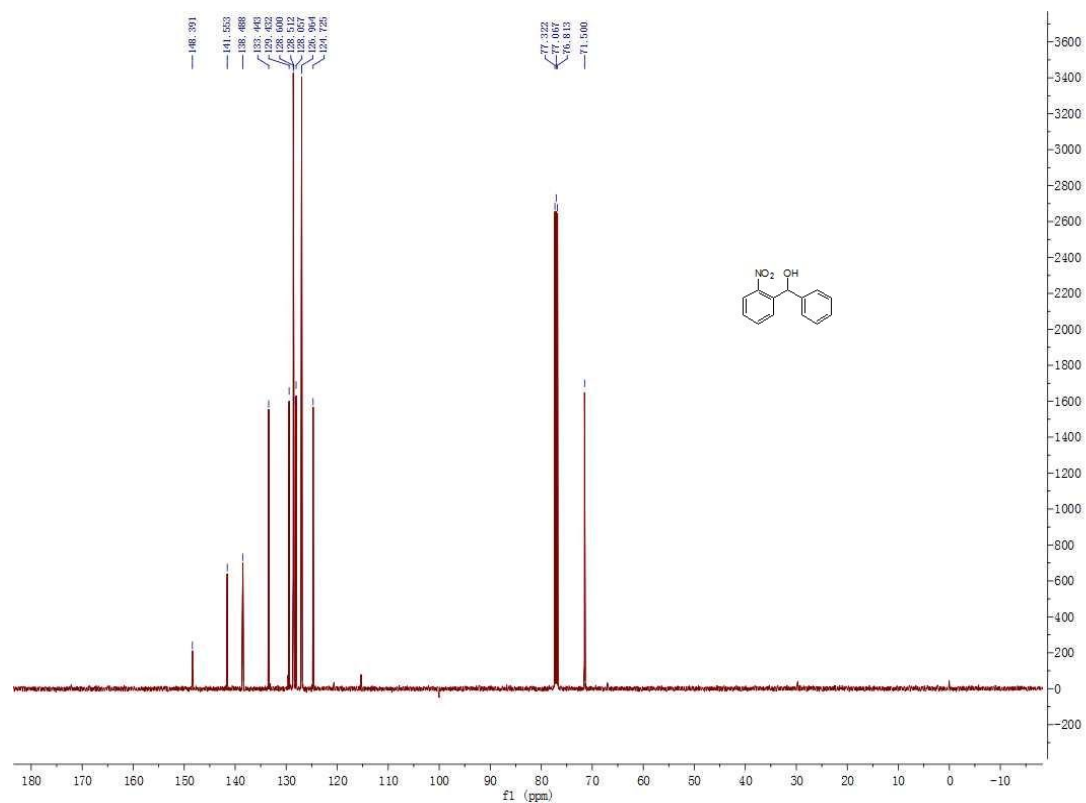
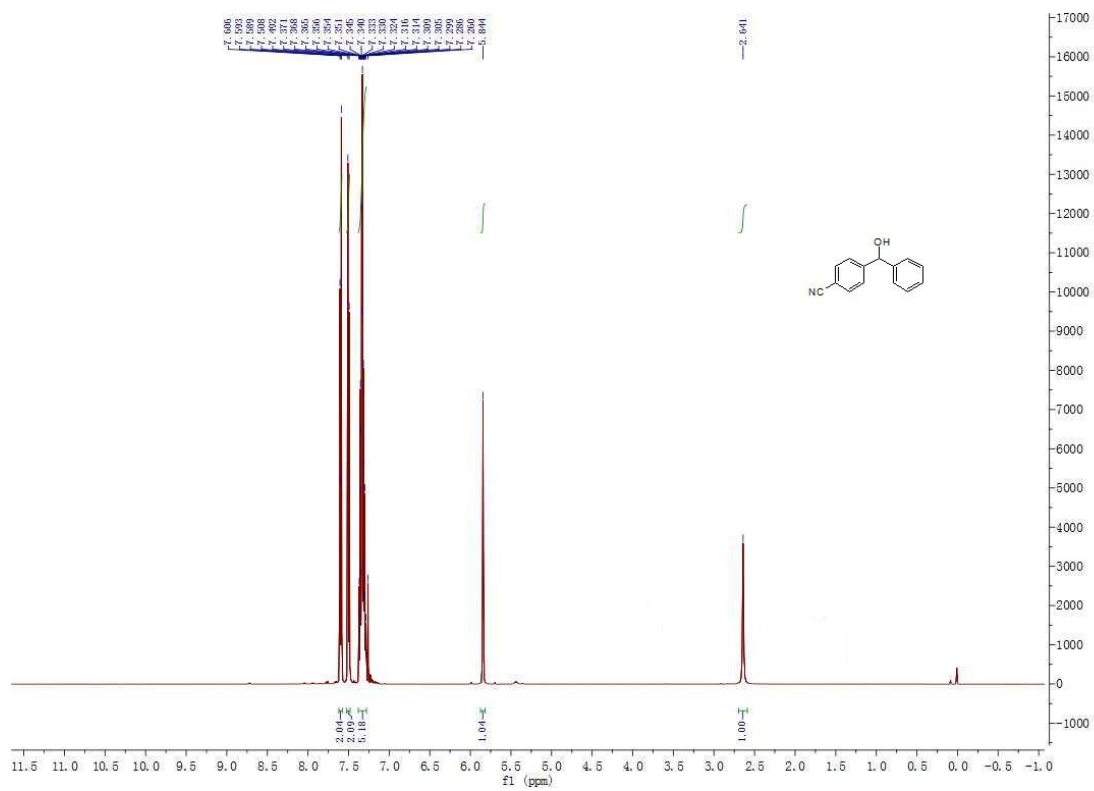
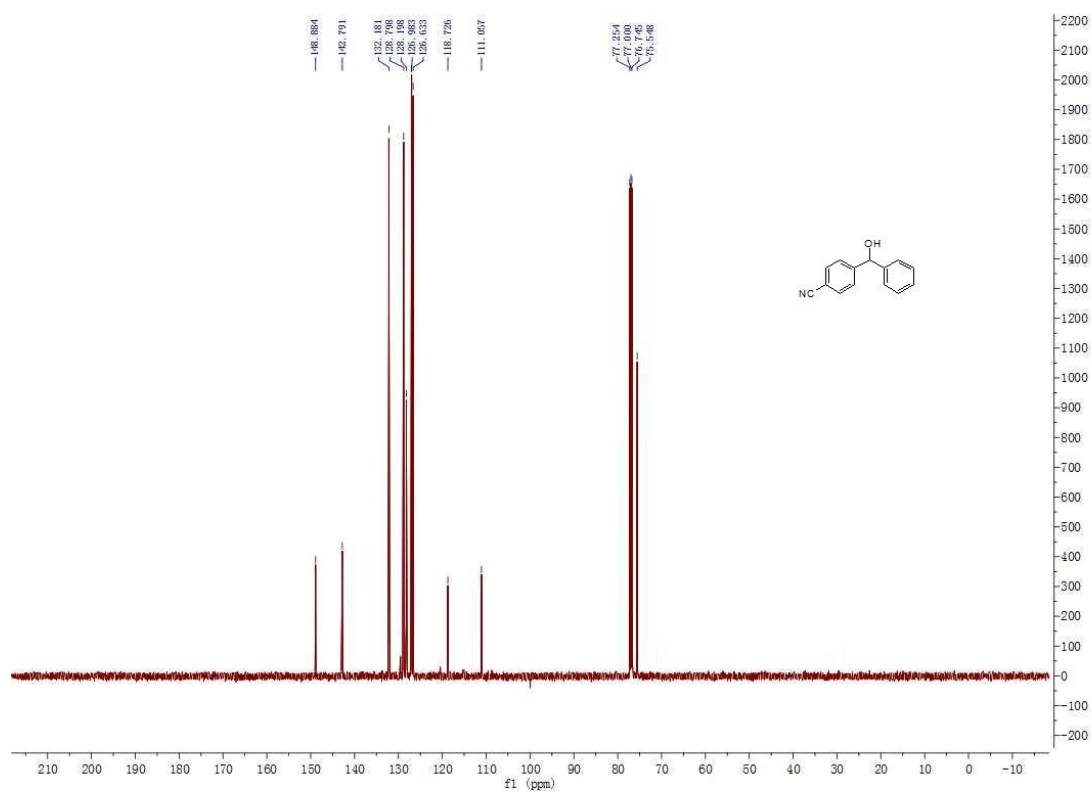
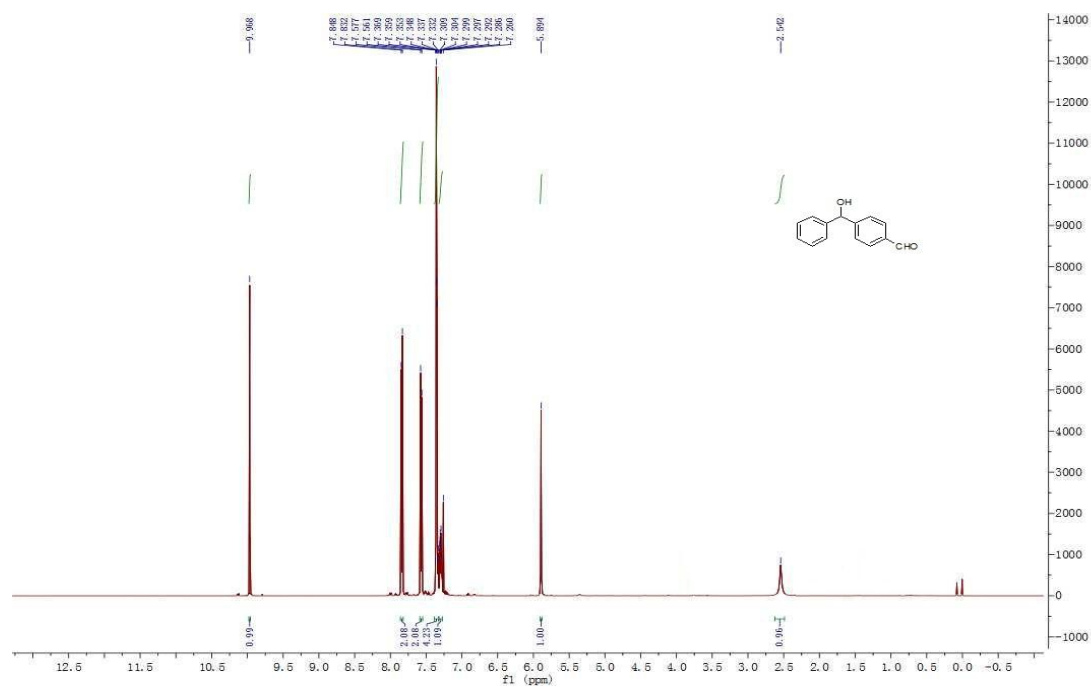


Figure S6.  $^1\text{H}$  NMR of **3f** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3f** (125 MHz,  $\text{CDCl}_3$ ).





**Figure S7.**  $^1\text{H}$  NMR of **3g** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3g** (125 MHz,  $\text{CDCl}_3$ ).





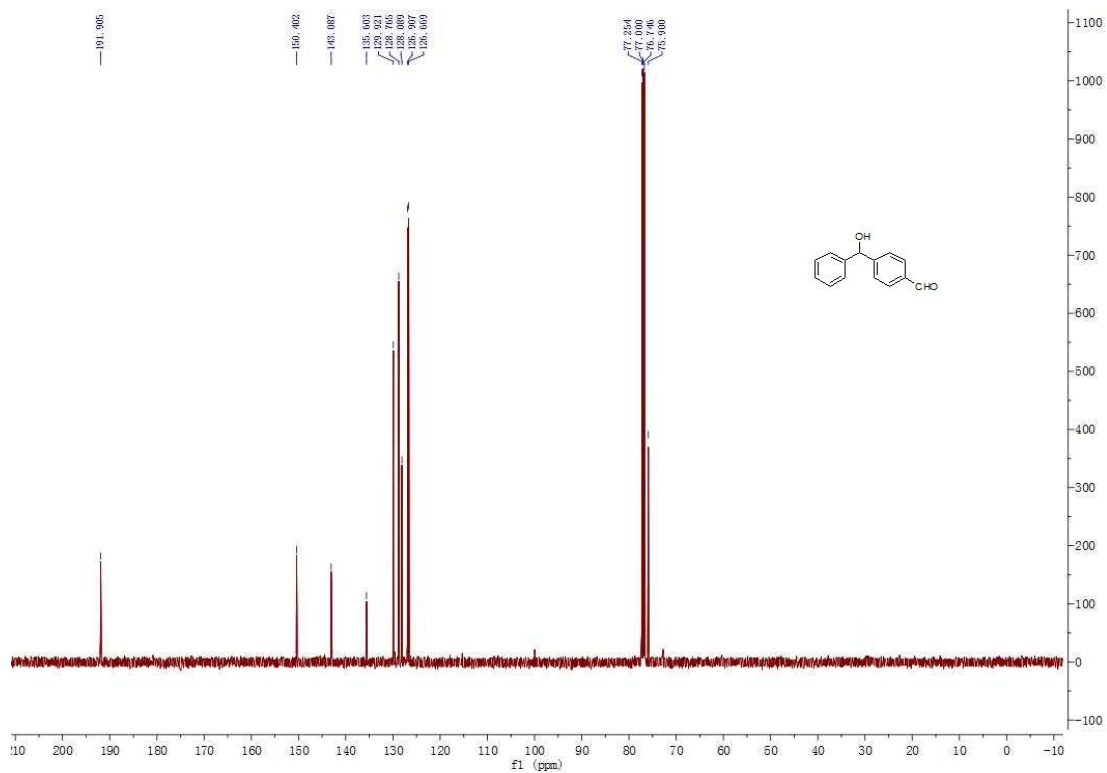
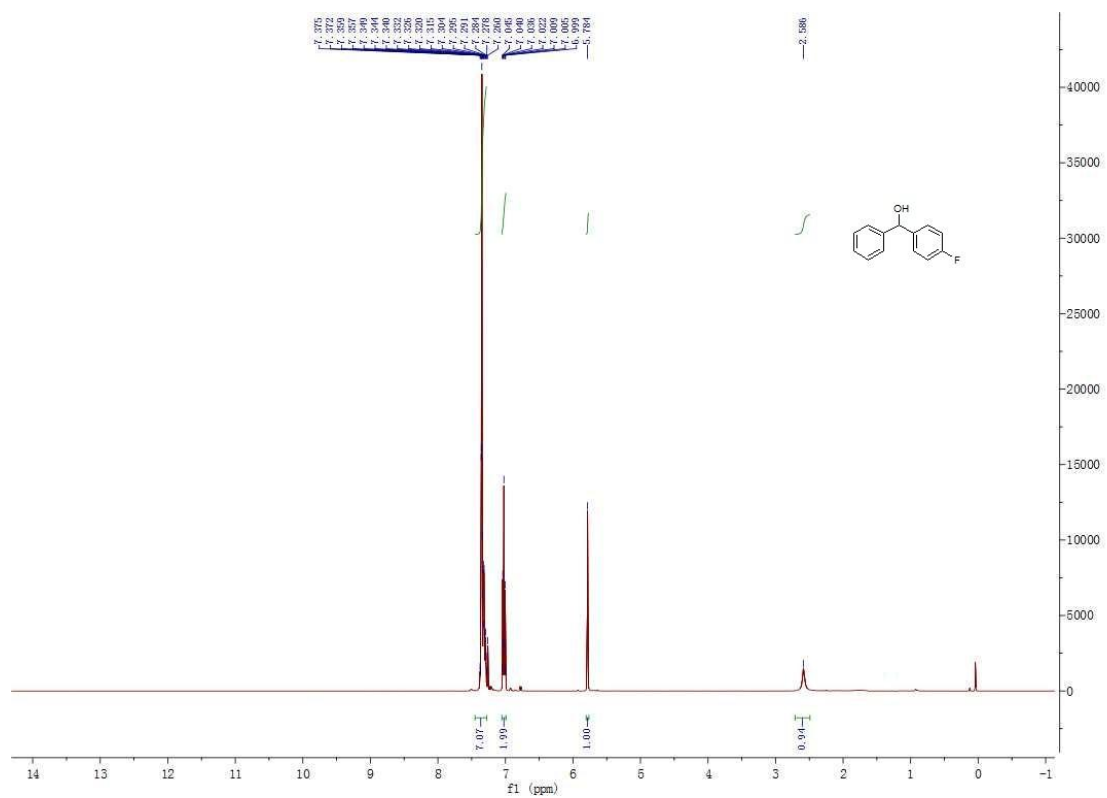
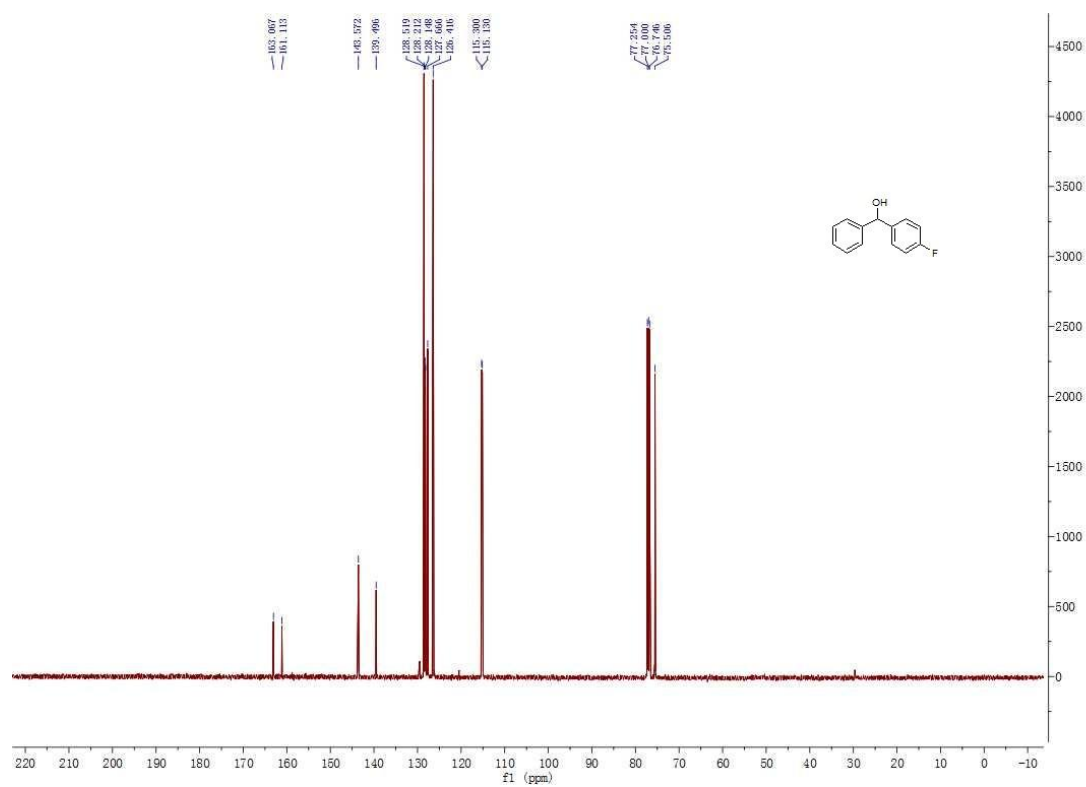
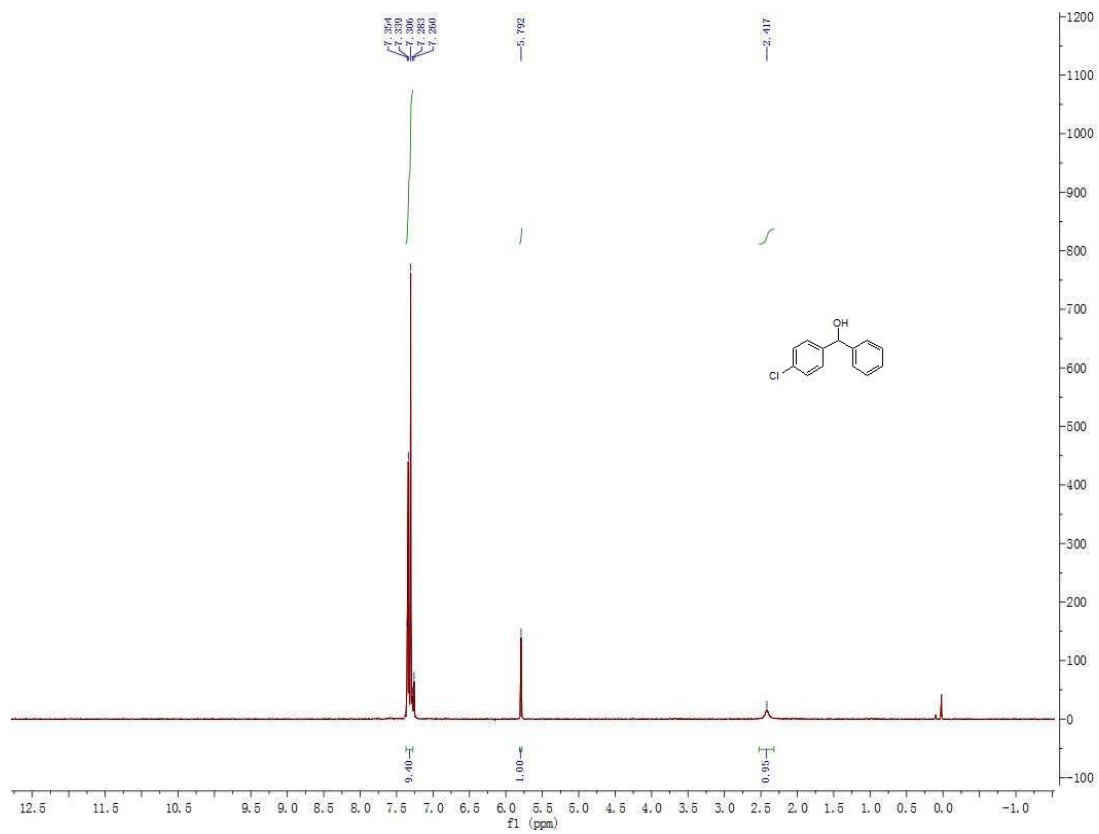


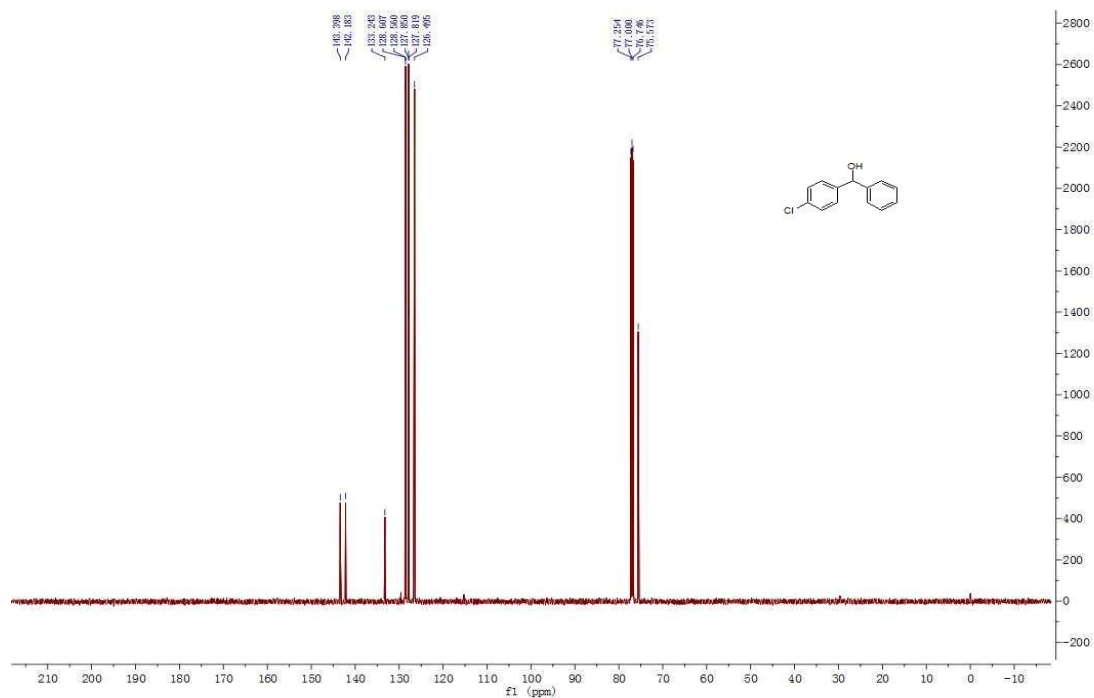
Figure S8.  $^1\text{H}$  NMR of **3h** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3h** (125 MHz,  $\text{CDCl}_3$ ).



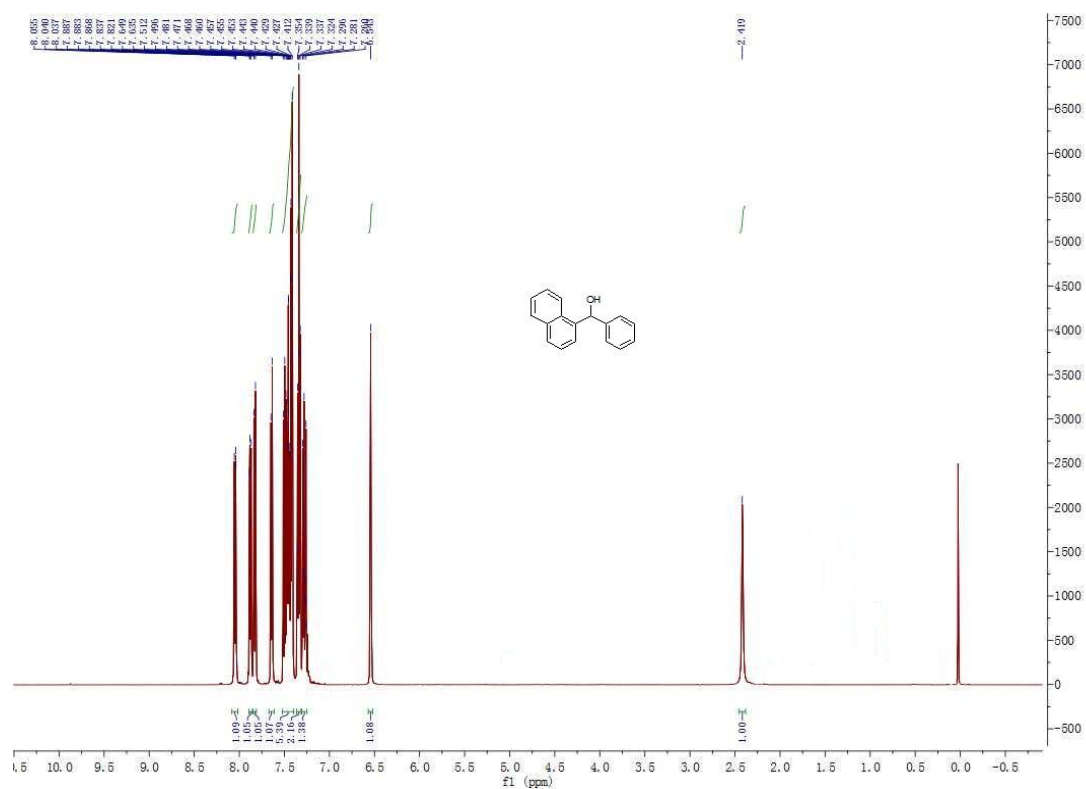


**Figure S9.**  $^1\text{H}$  NMR of **3i** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3i** (125 MHz,  $\text{CDCl}_3$ ).





**Figure S10.**  $^1\text{H}$  NMR of **3j** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3j** (125 MHz,  $\text{CDCl}_3$ ).



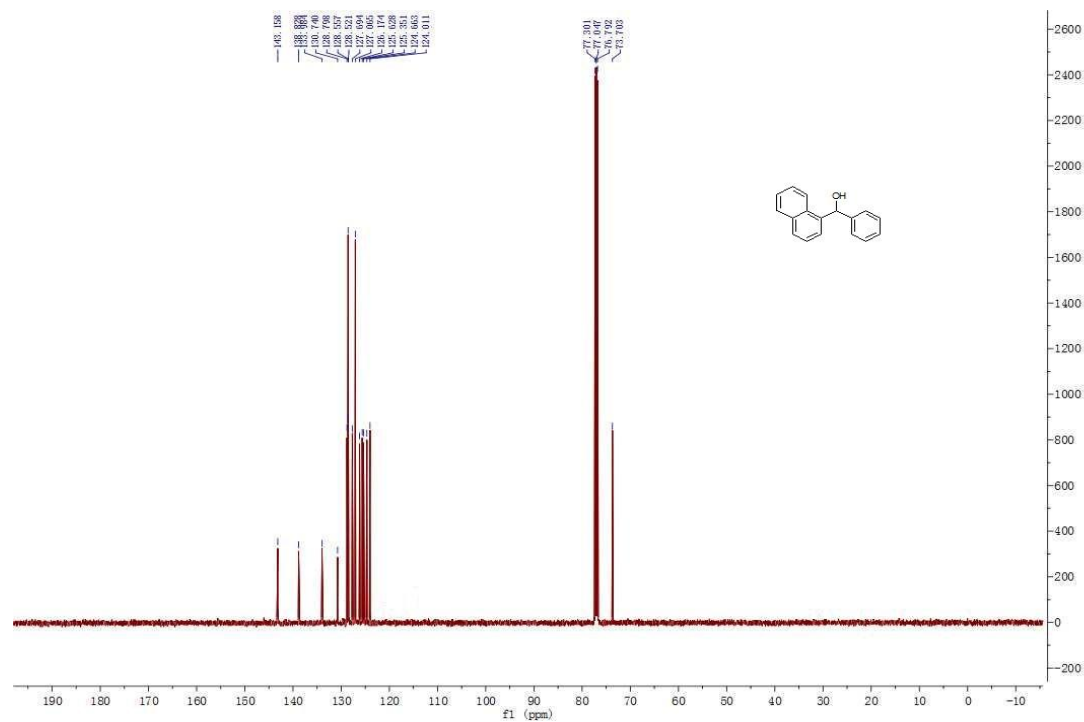
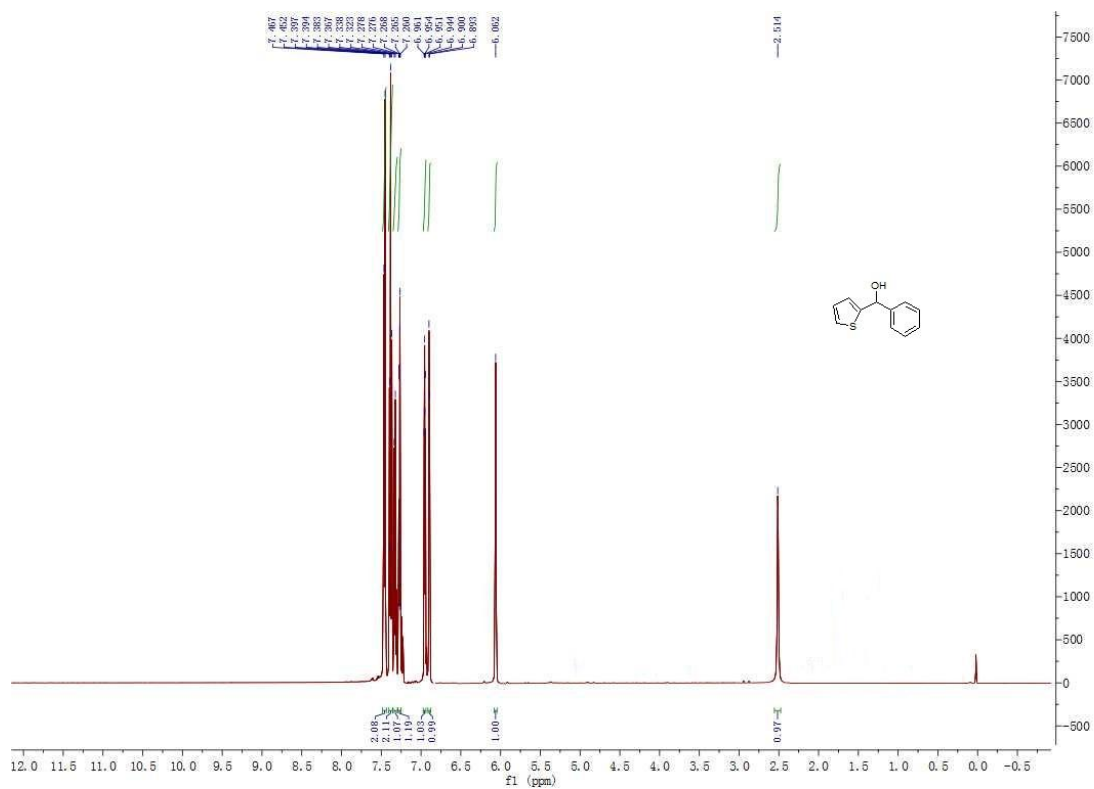


Figure S11. <sup>1</sup>H NMR of **3k** (500 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3k** (125 MHz, CDCl<sub>3</sub>).



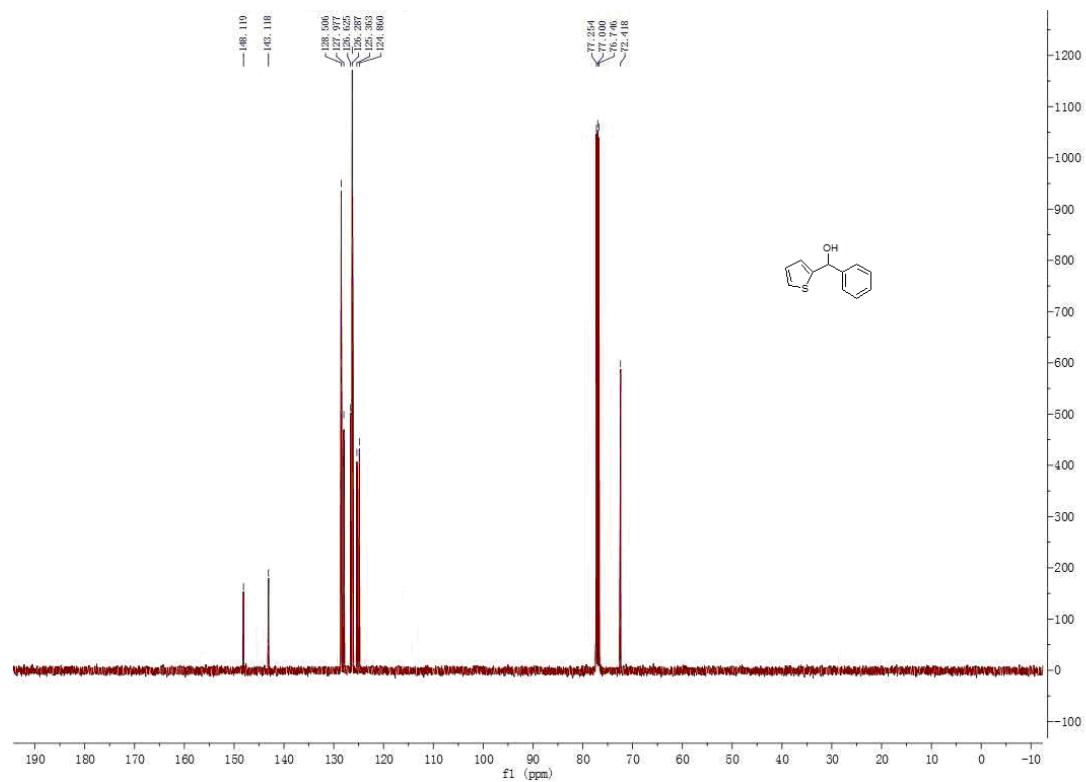
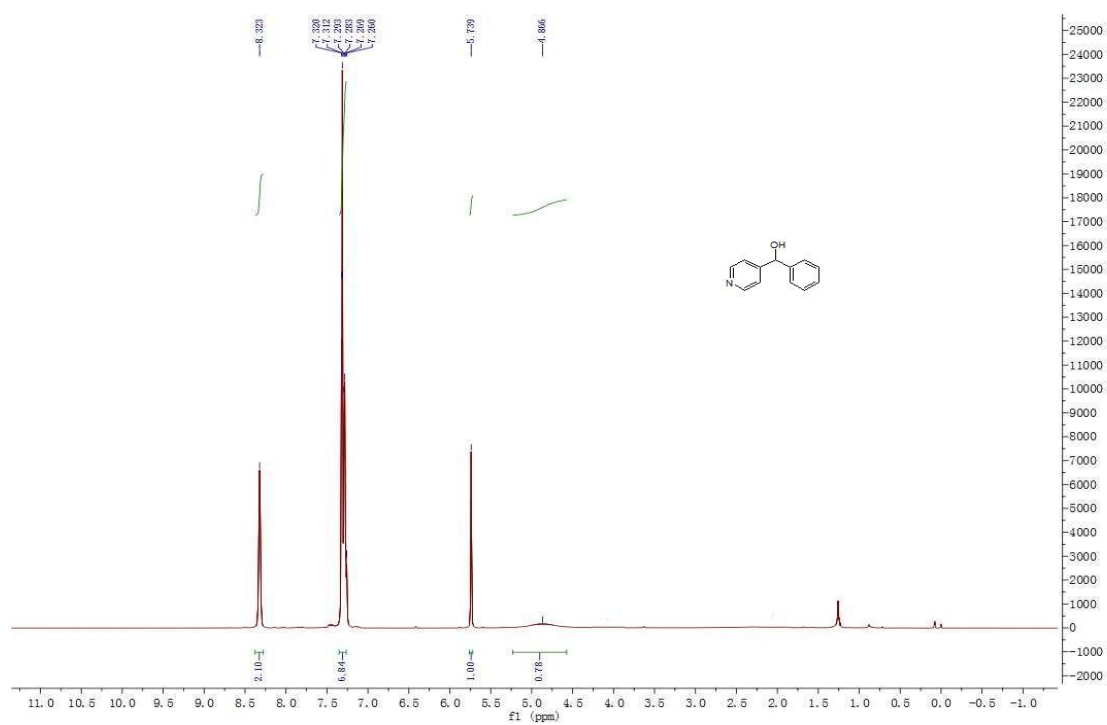


Figure S12.  $^1\text{H}$  NMR of **31** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **31** (125 MHz,  $\text{CDCl}_3$ ).



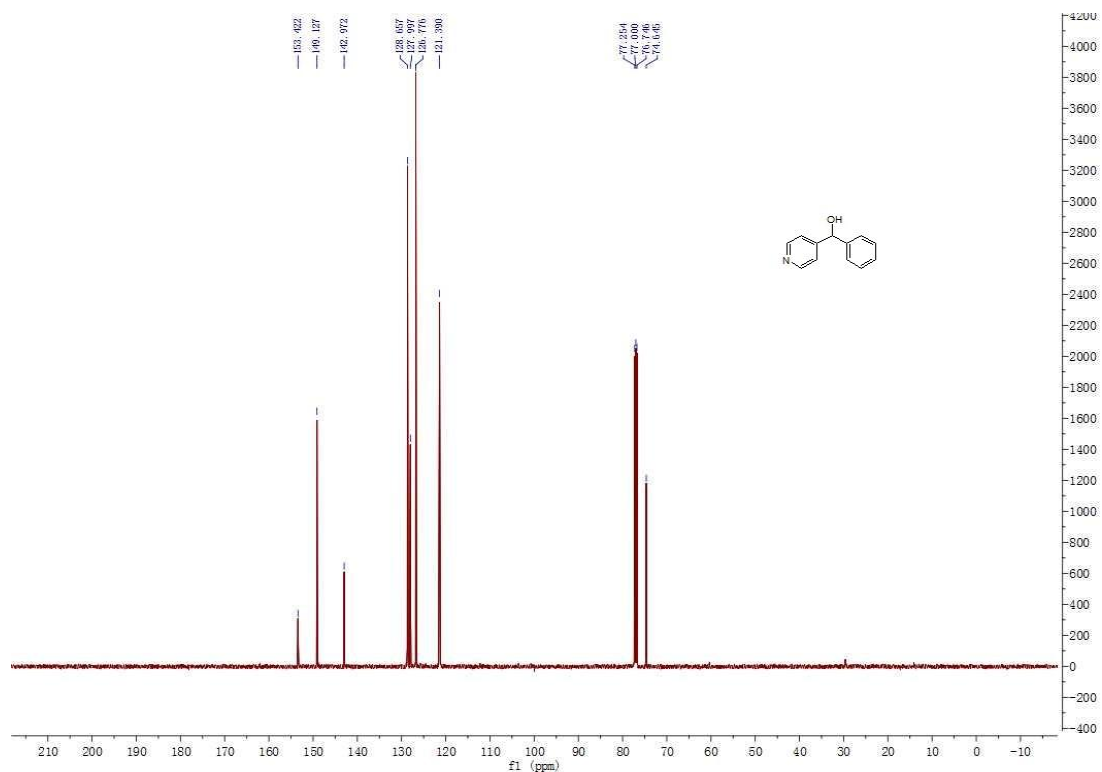
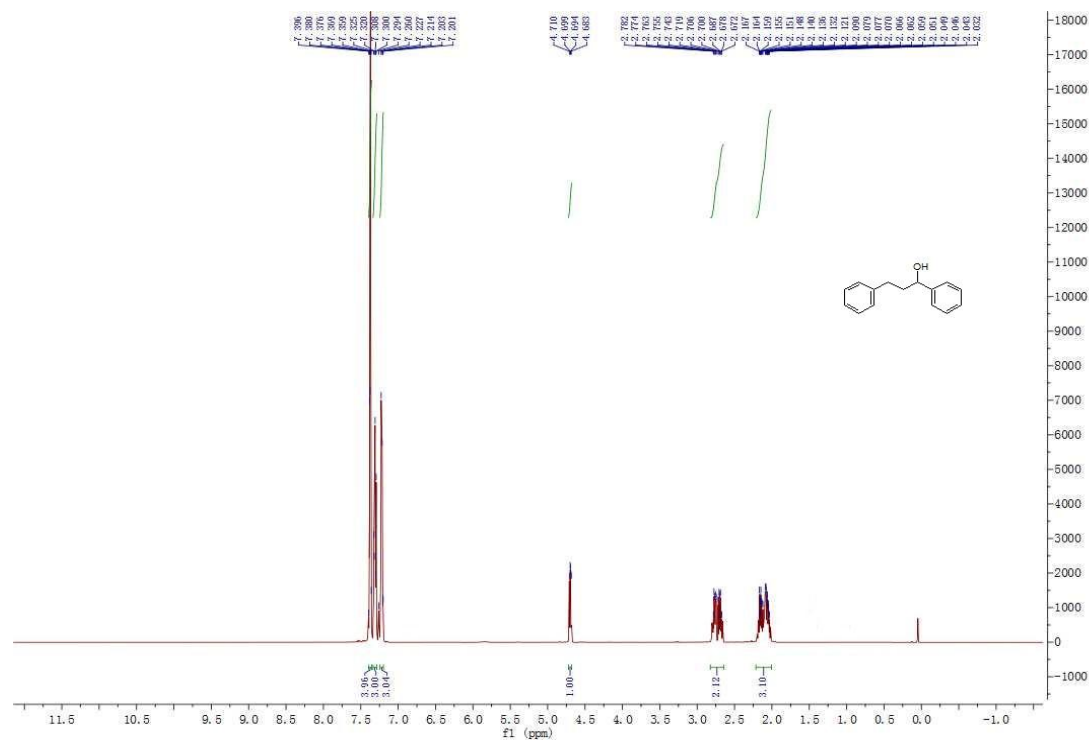


Figure S13.  $^1\text{H}$  NMR of **3m** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3m** (125 MHz,  $\text{CDCl}_3$ ).



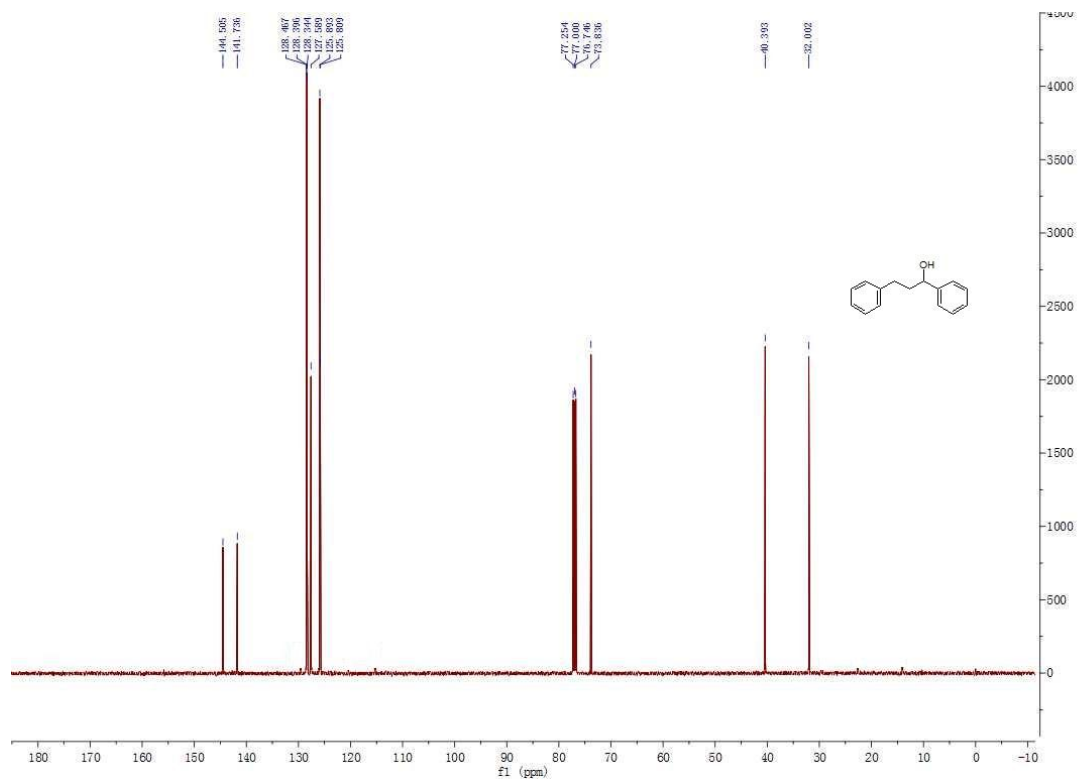
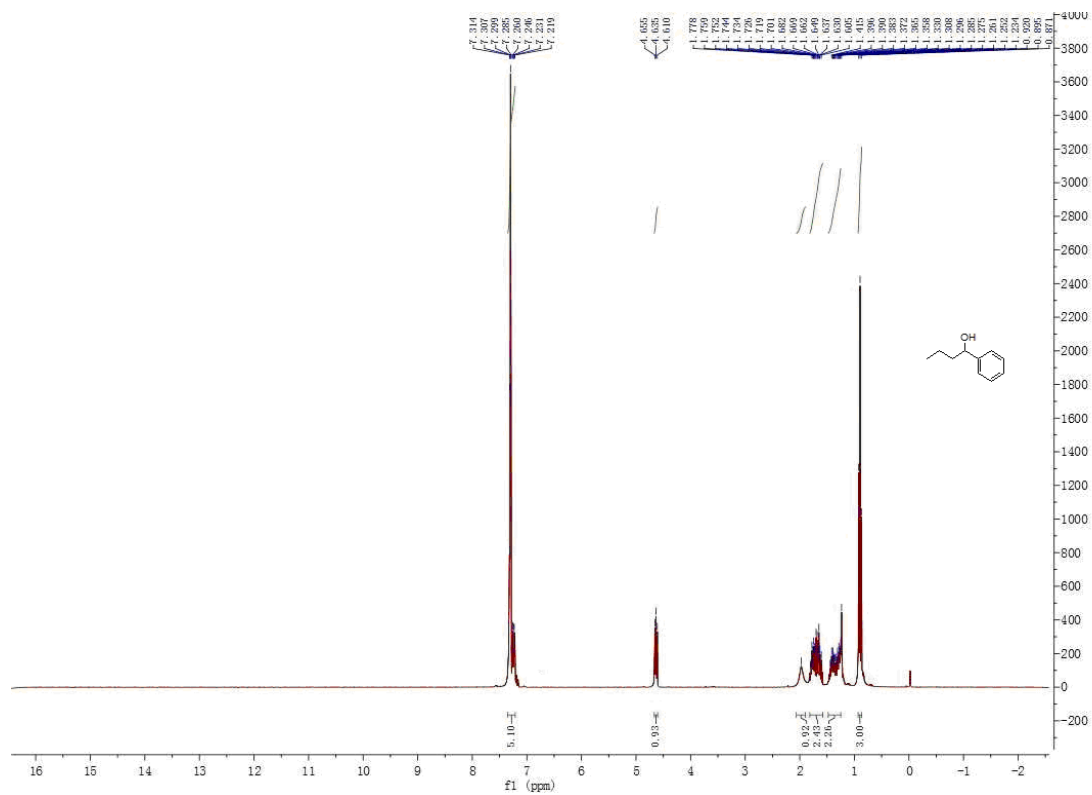


Figure S14.  $^1\text{H}$  NMR of 3n (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of 3n (125 MHz,  $\text{CDCl}_3$ ).



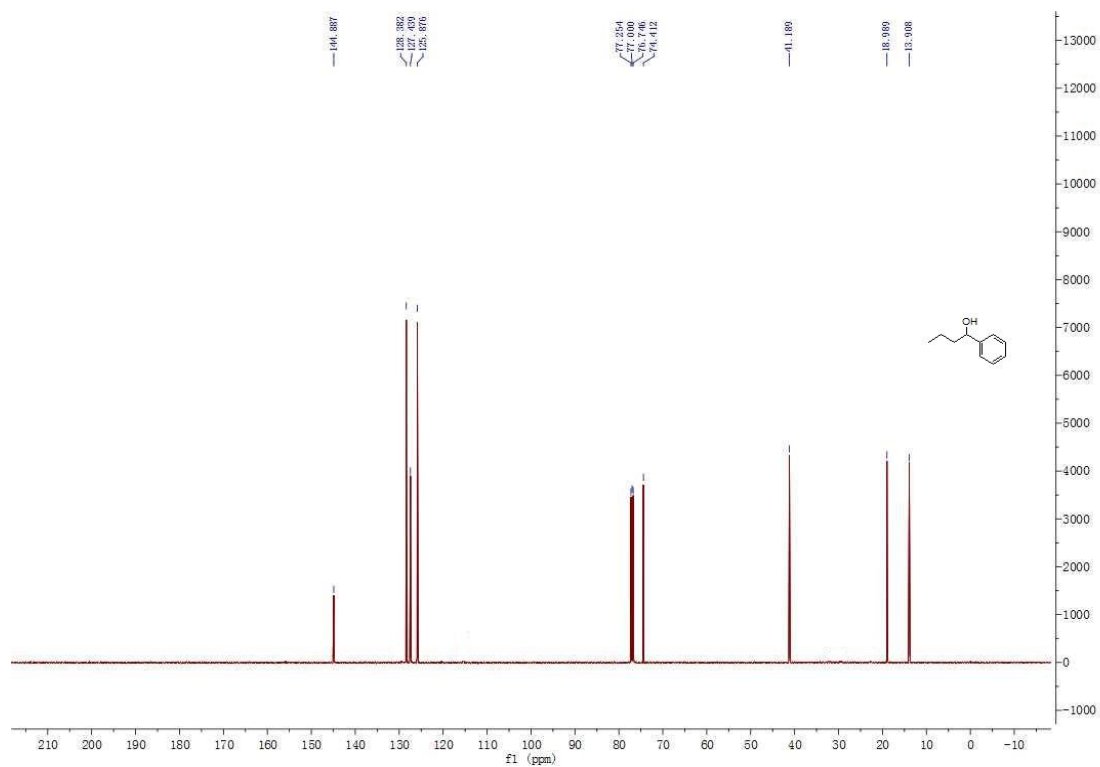
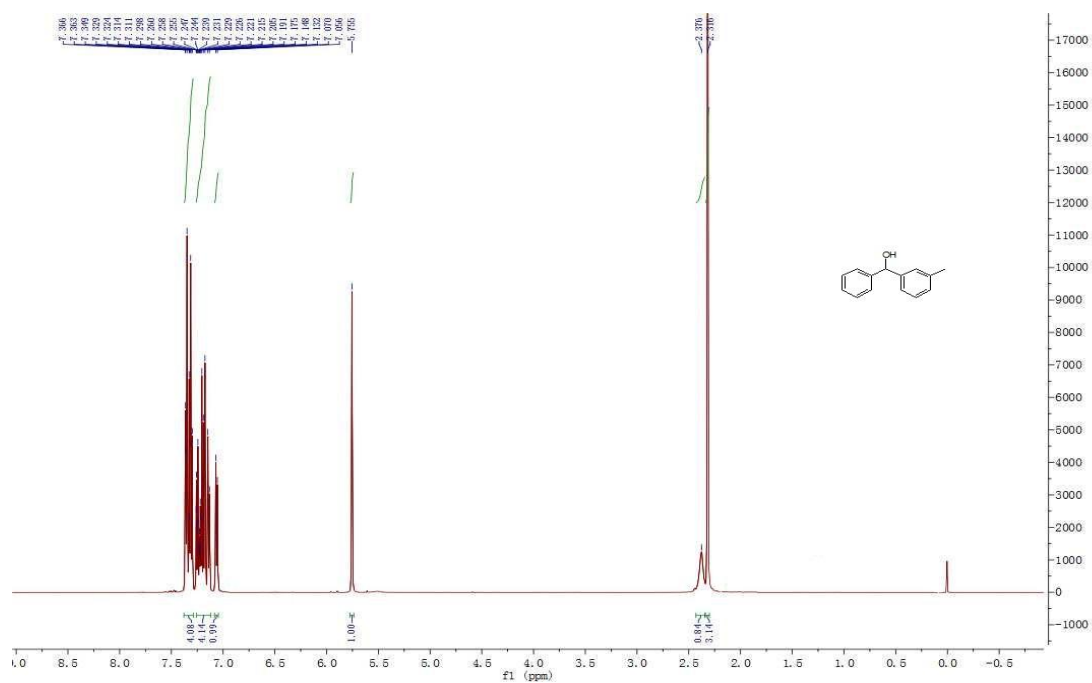


Figure S15.  $^1\text{H}$  NMR of **3o** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3o** (125 MHz,  $\text{CDCl}_3$ ).





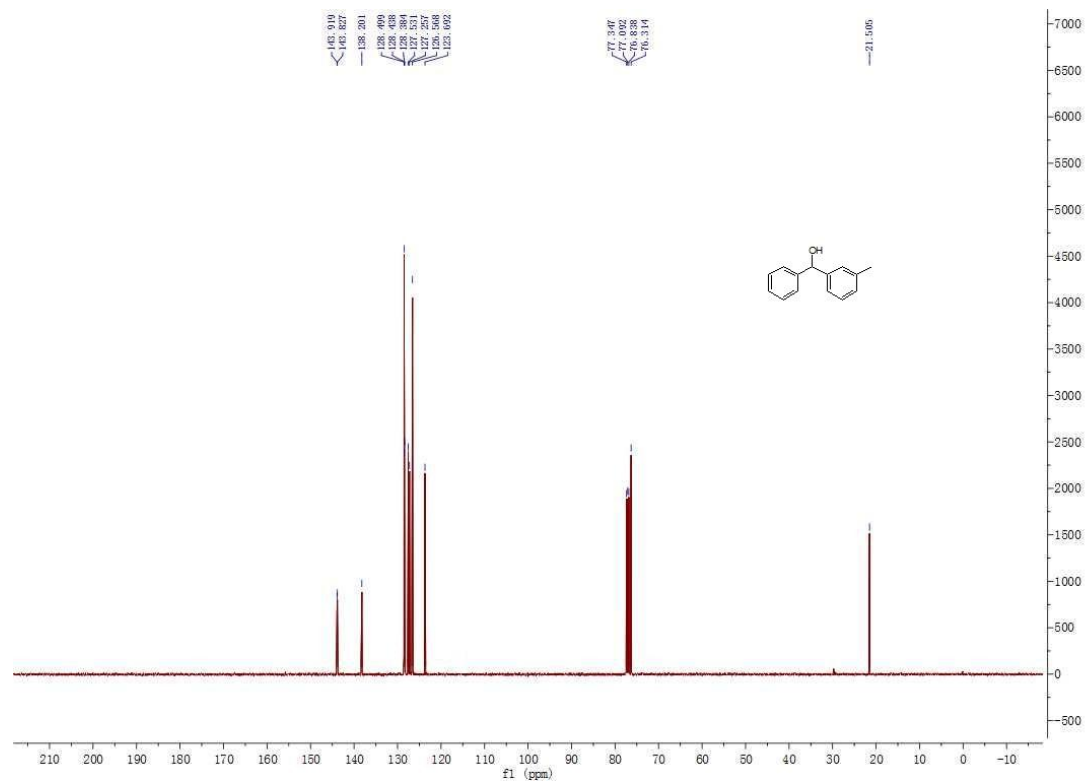
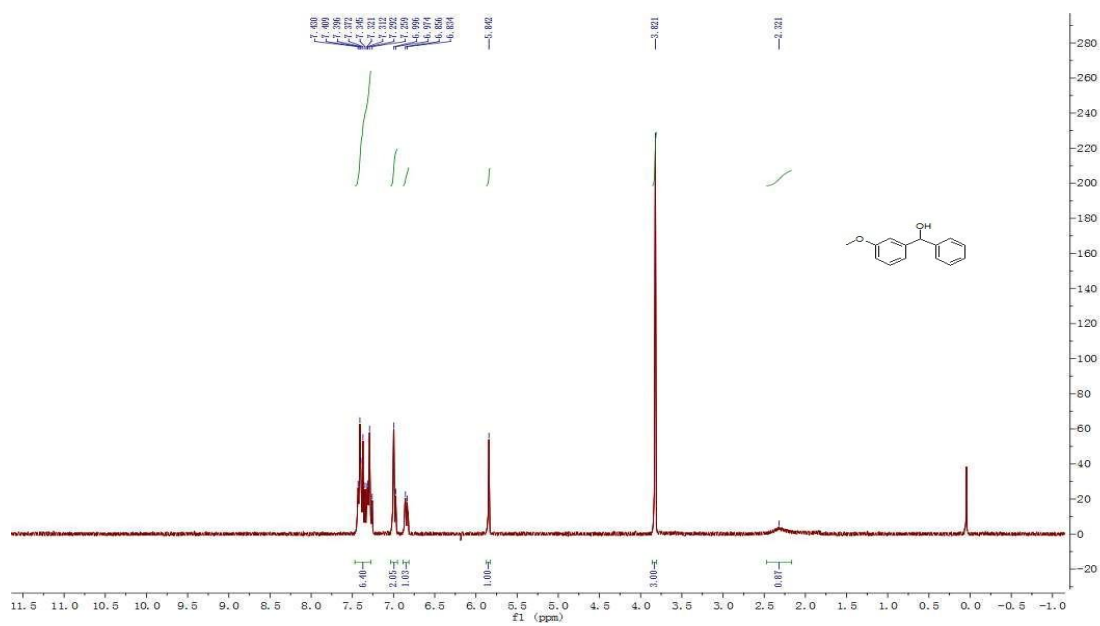


Figure S16.  $^1\text{H}$  NMR of **3p** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3p** (125 MHz,  $\text{CDCl}_3$ ).



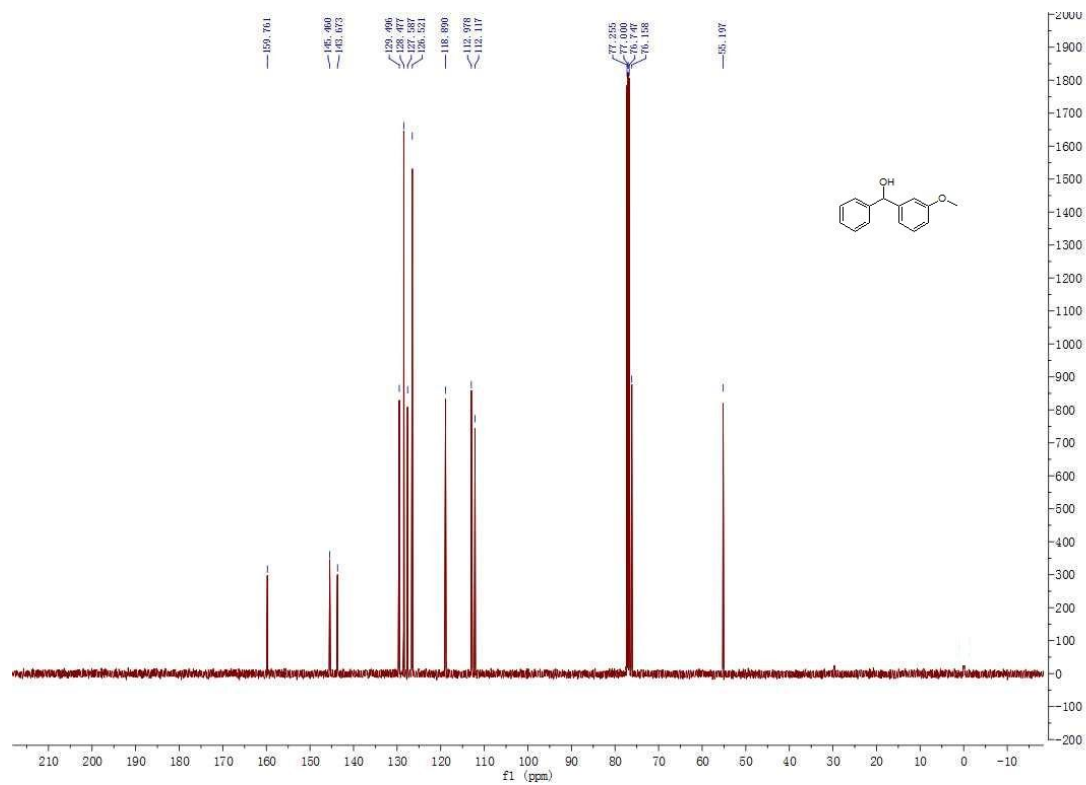
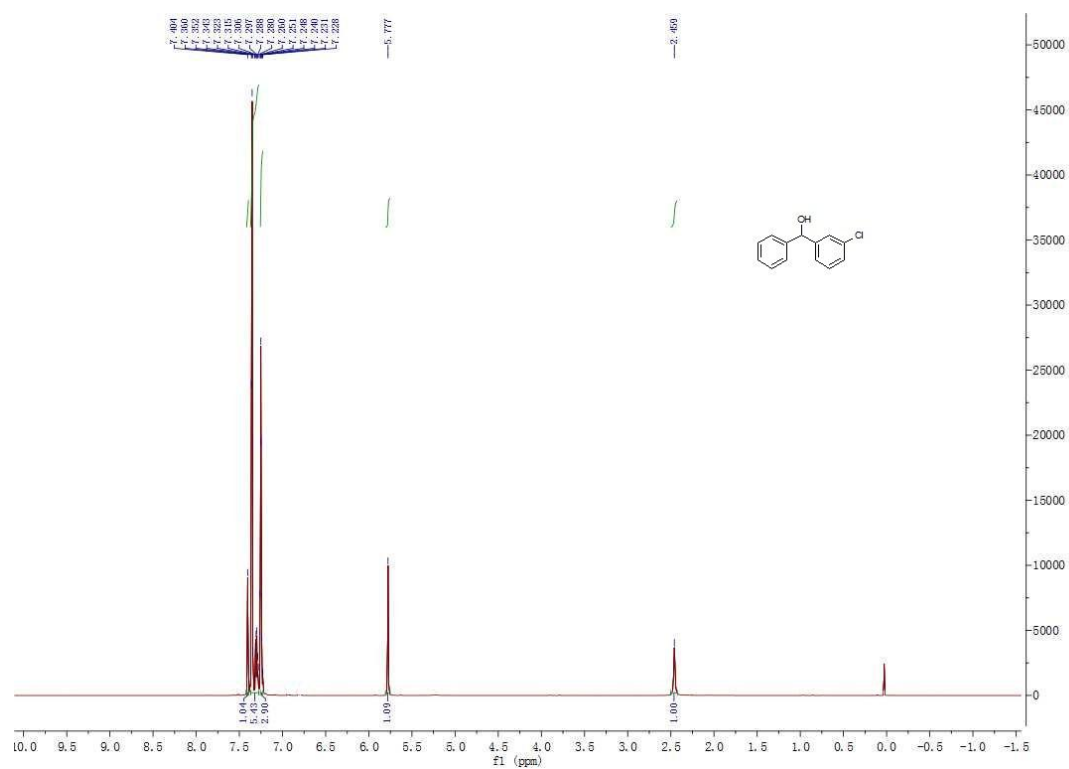
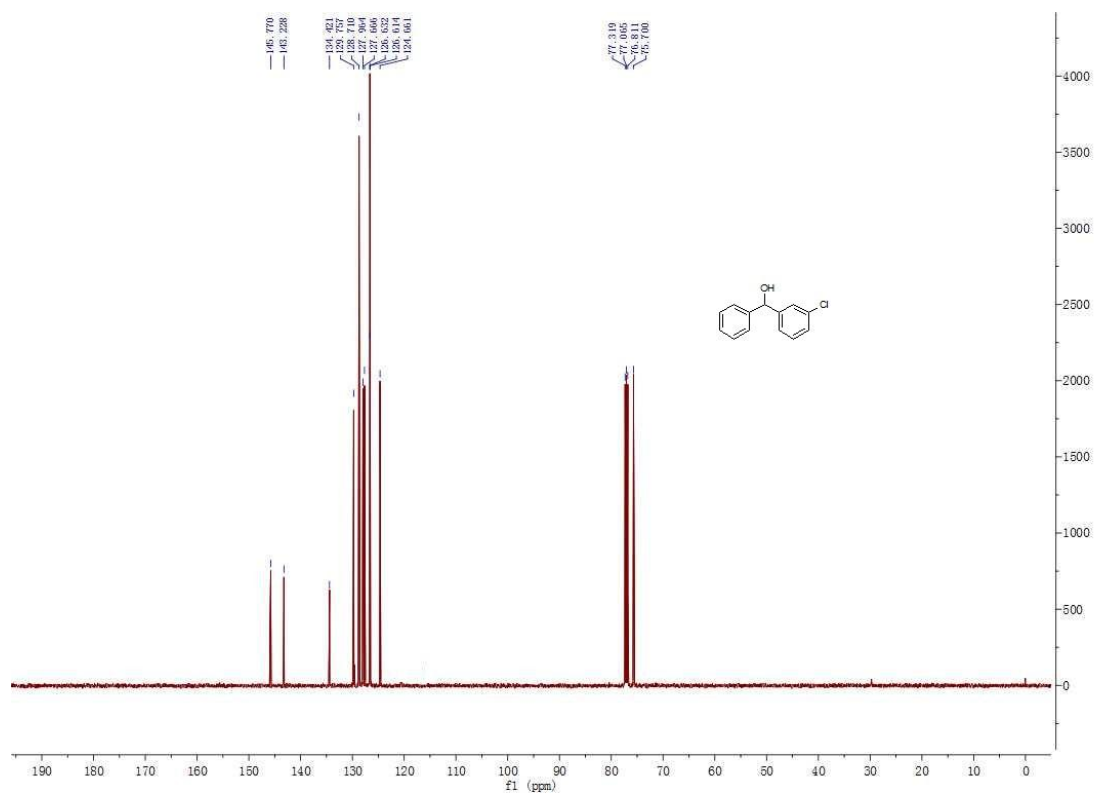
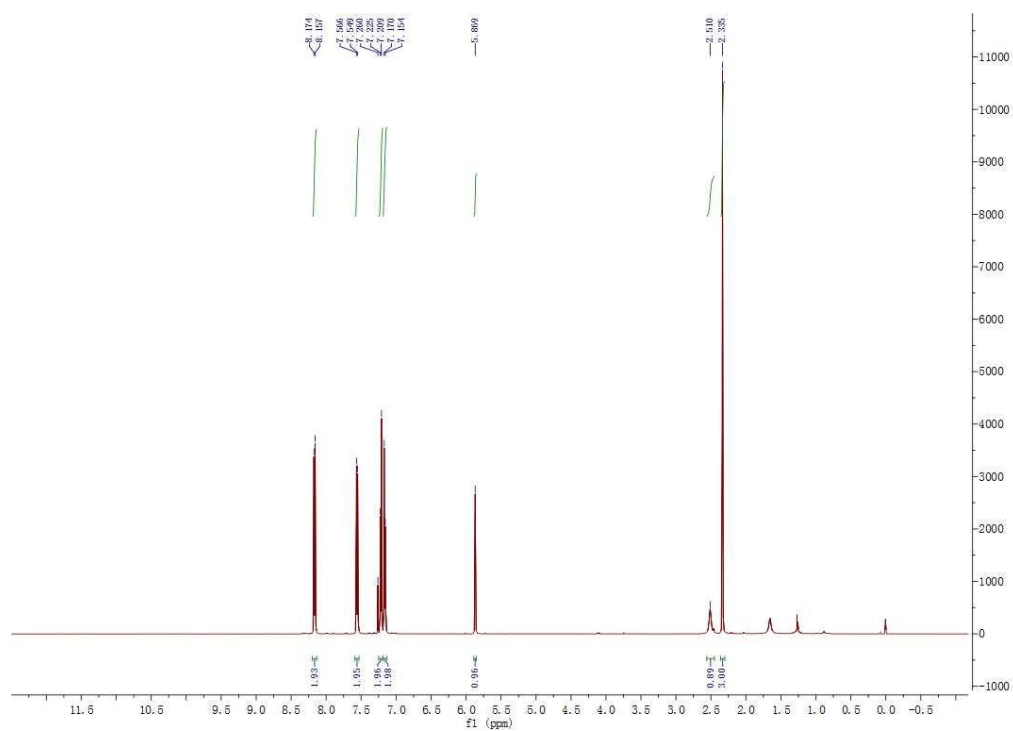


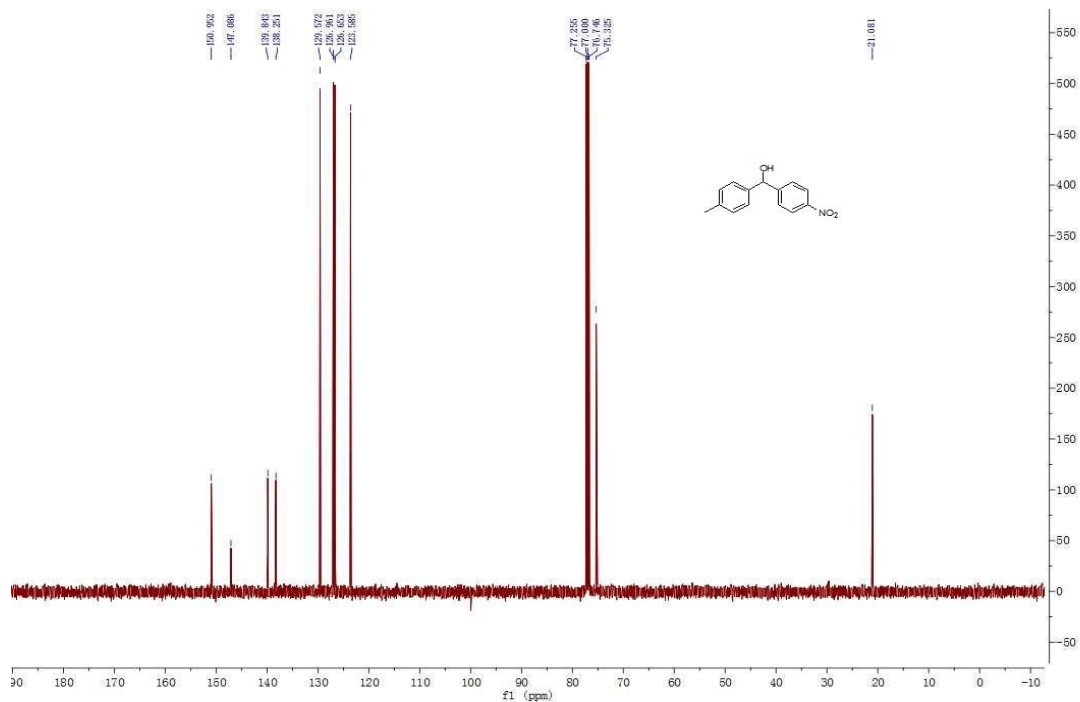
Figure S17.  $^1\text{H}$  NMR of **3q** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3q** (125 MHz,  $\text{CDCl}_3$ ).



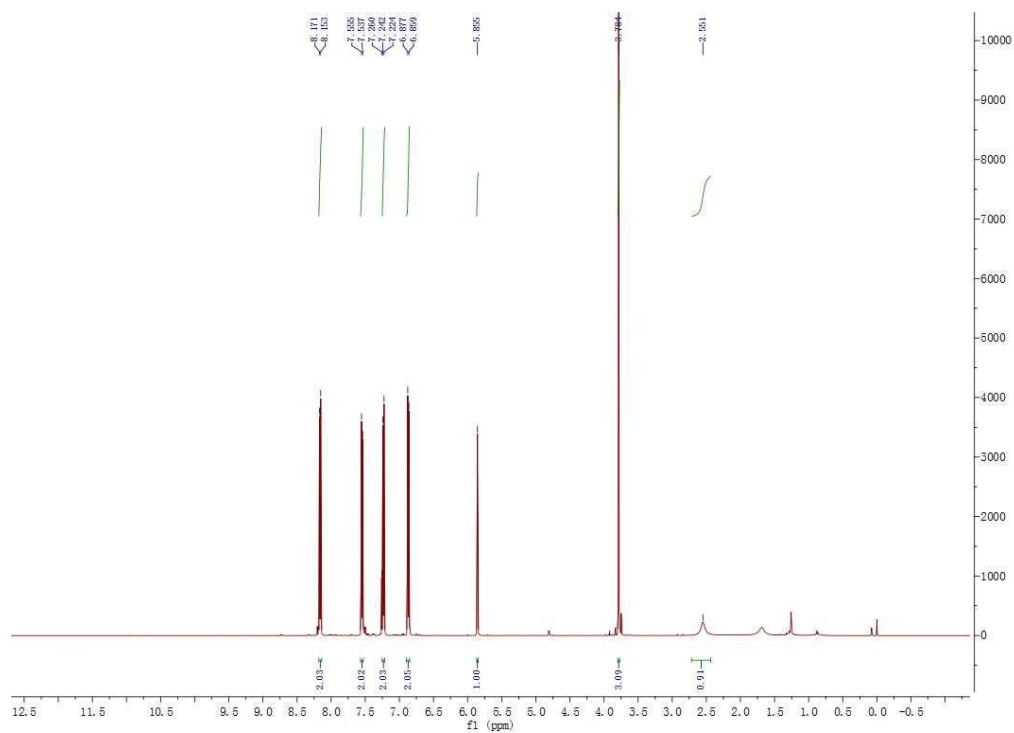


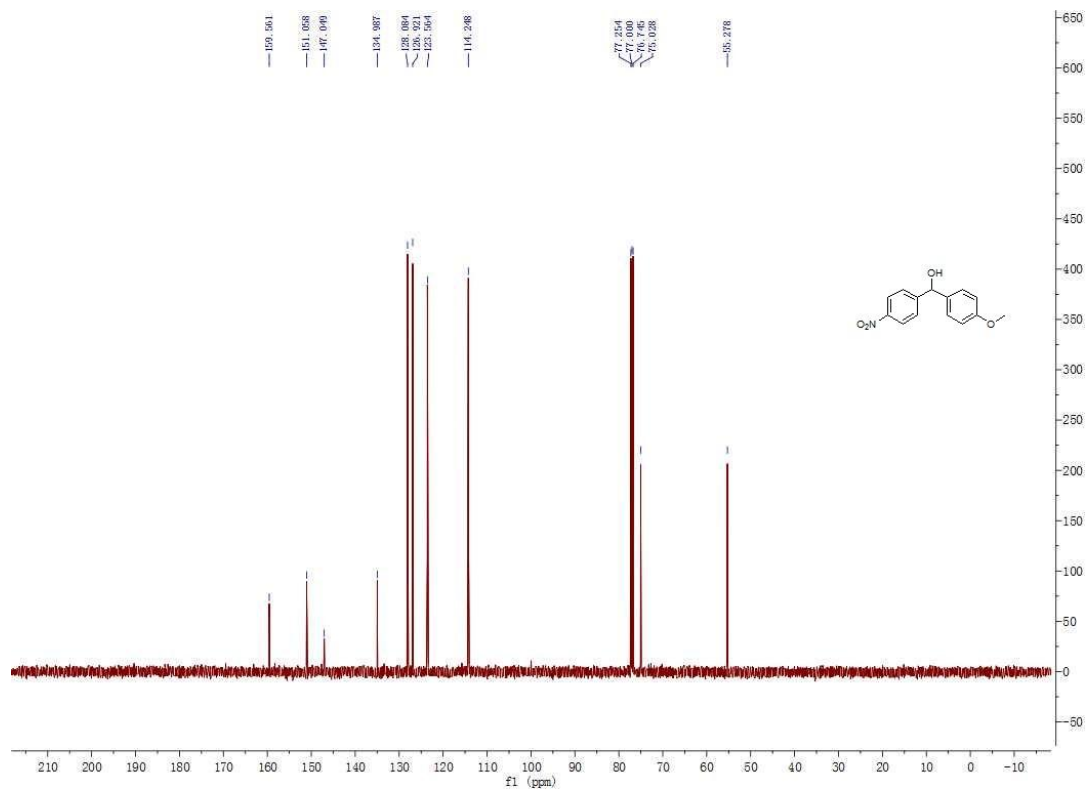
**Figure S18.**  $^1\text{H}$  NMR of **3r** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3r** (125 MHz,  $\text{CDCl}_3$ ).



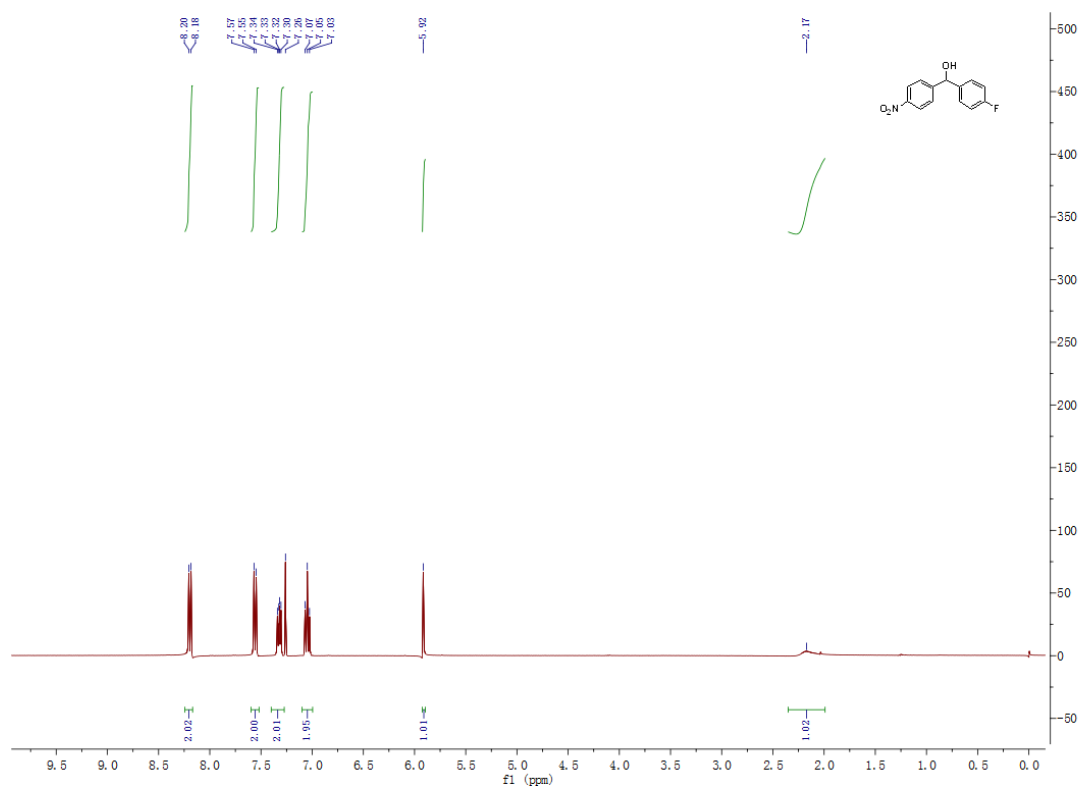


**Figure S19.**  $^1\text{H}$  NMR of **3s** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3s** (125 MHz,  $\text{CDCl}_3$ ).





**Figure S20.** <sup>1</sup>H NMR of **3t** (500 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3t** (125 MHz, CDCl<sub>3</sub>).



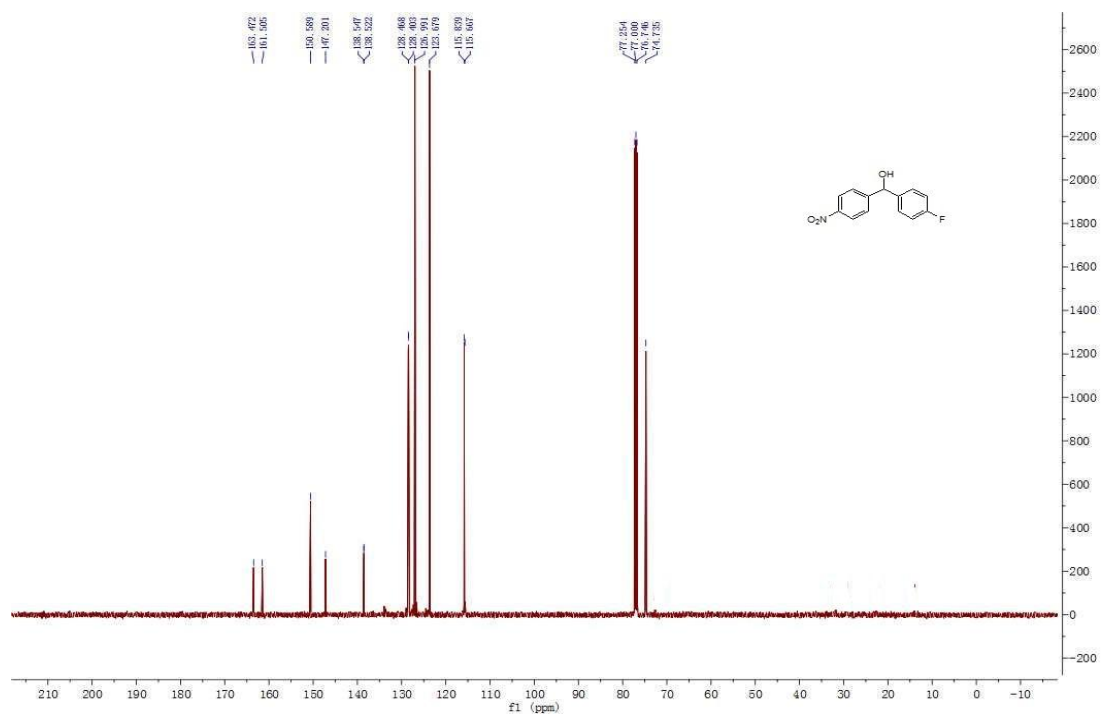
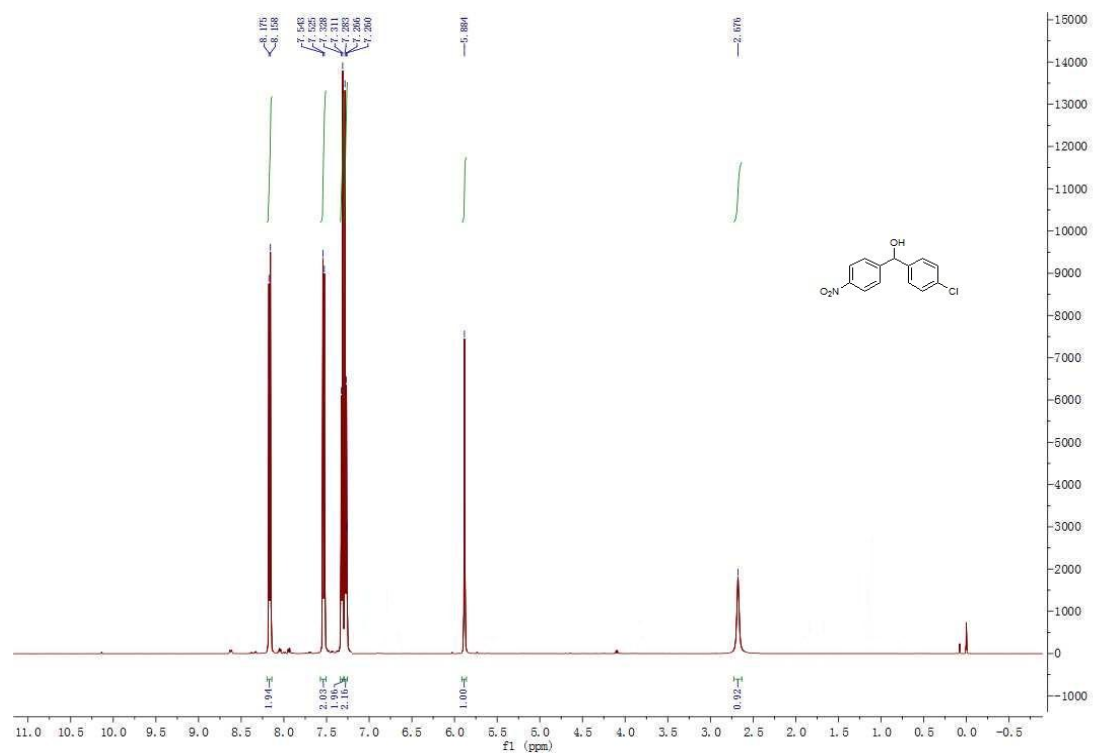


Figure S21.  $^1\text{H}$  NMR of **3u** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3u** (125 MHz,  $\text{CDCl}_3$ ).



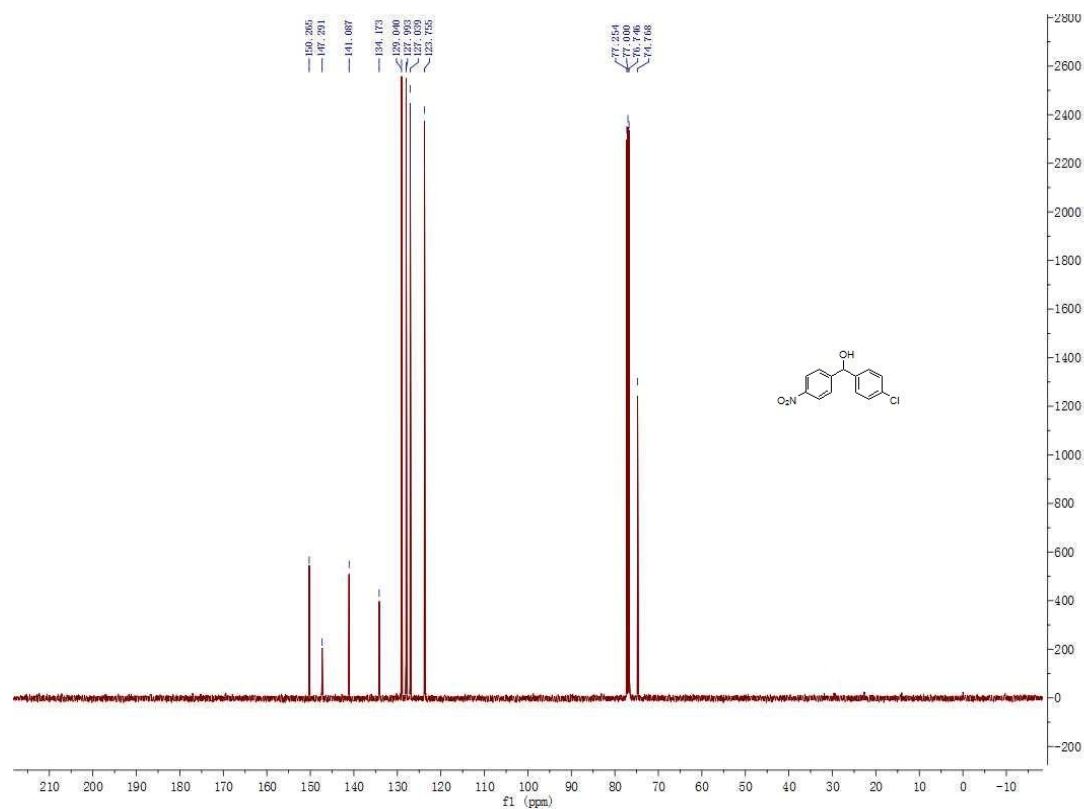
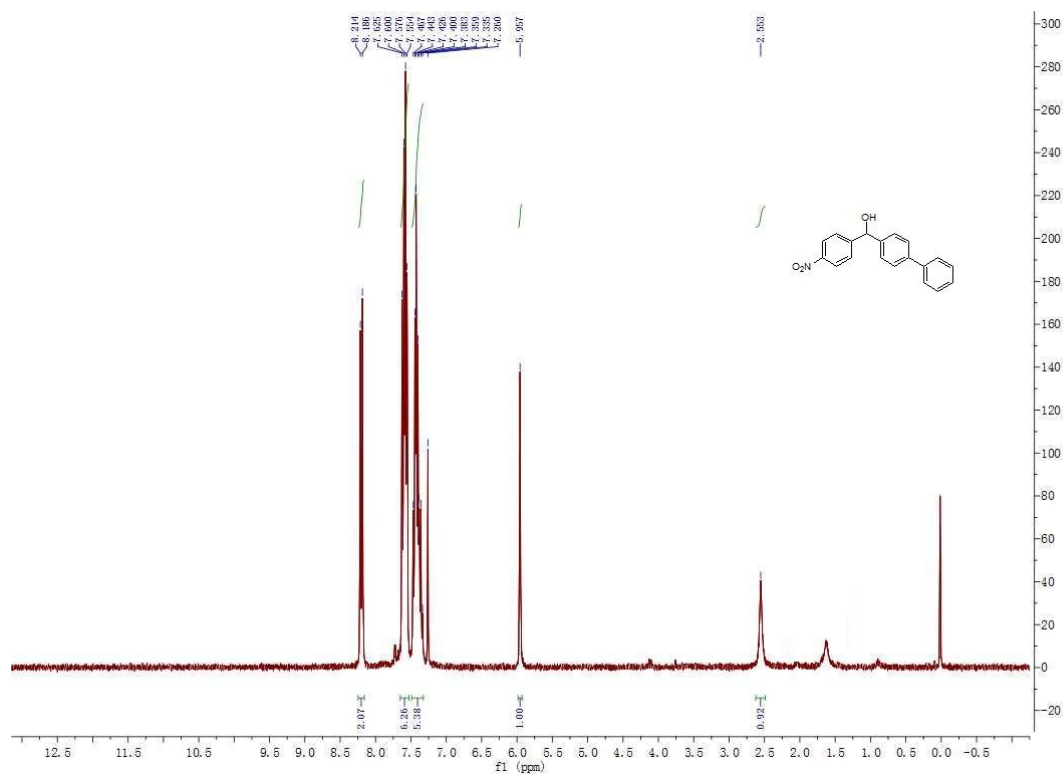
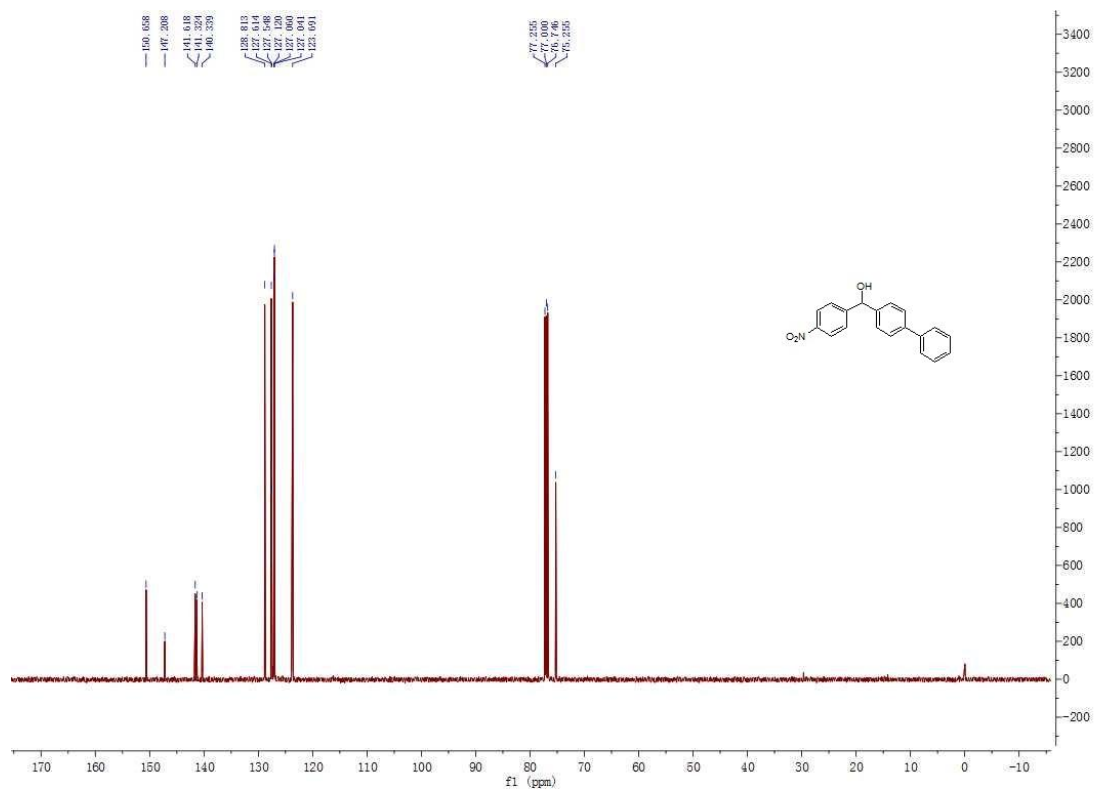
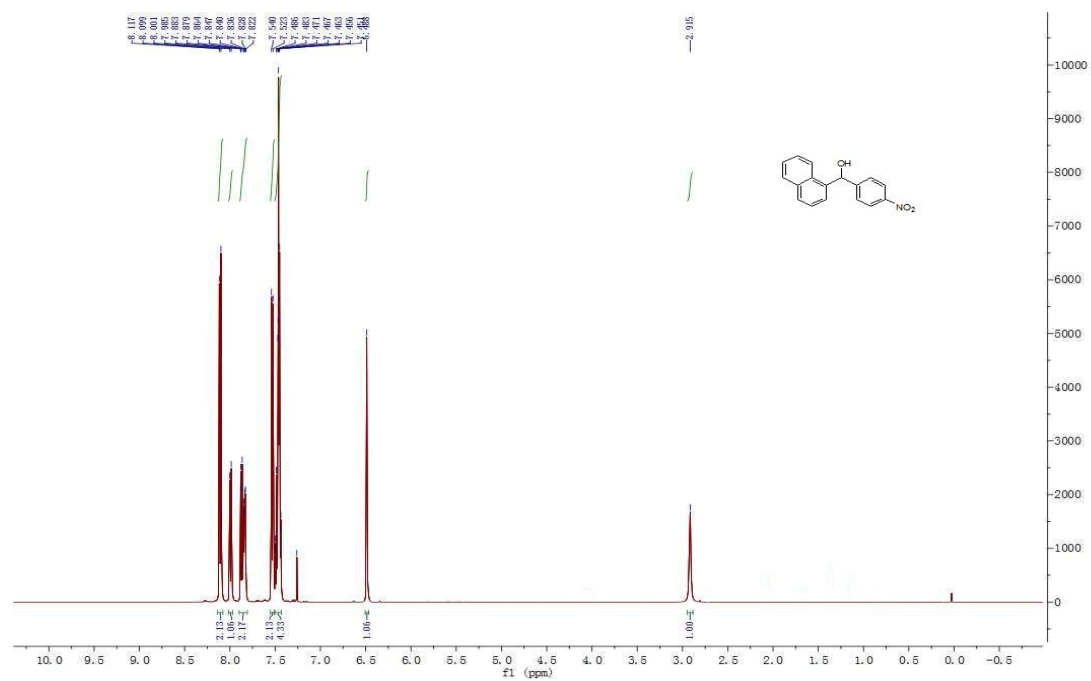


Figure S22.  $^1\text{H}$  NMR of **3v** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3v** (125 MHz,  $\text{CDCl}_3$ ).





**Figure S23.** <sup>1</sup>H NMR of **3w** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3w** (125 MHz, CDCl<sub>3</sub>).





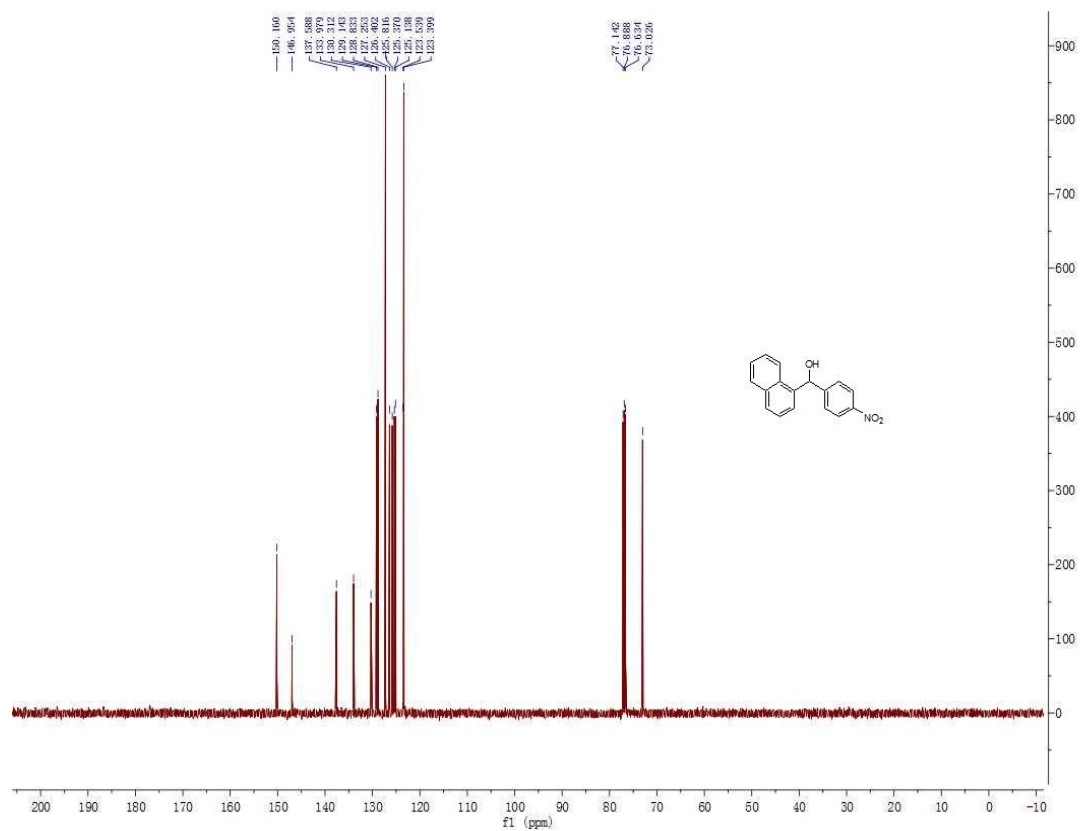
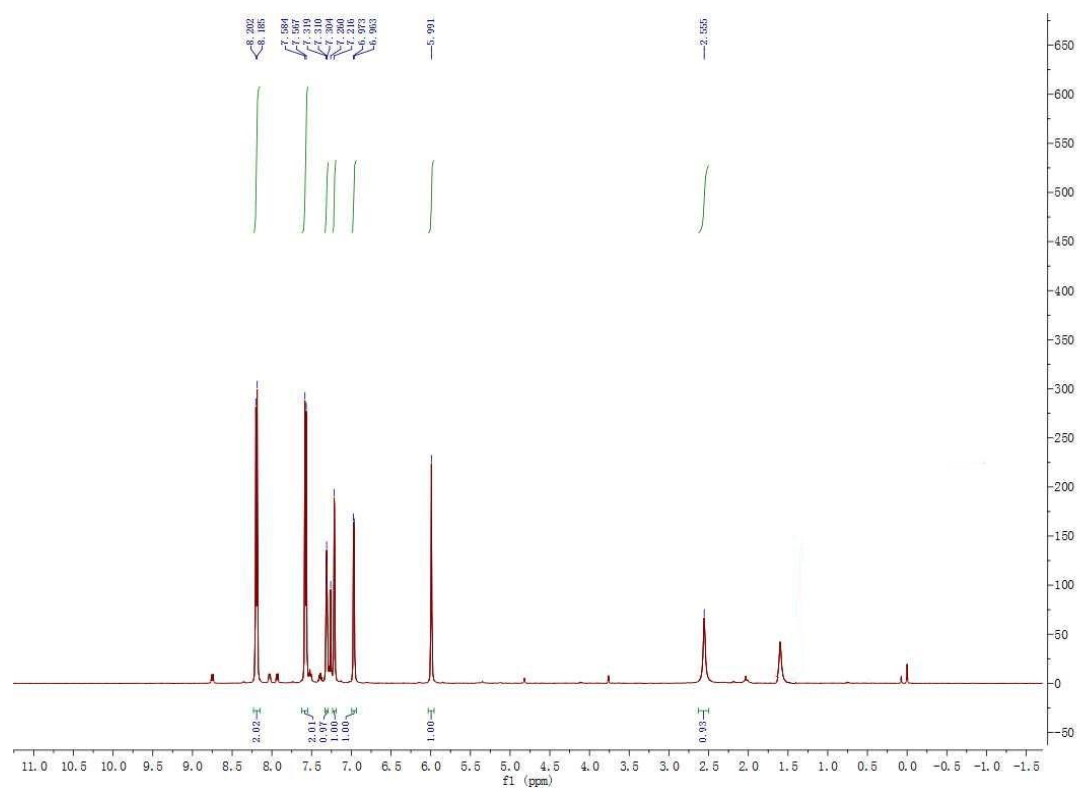
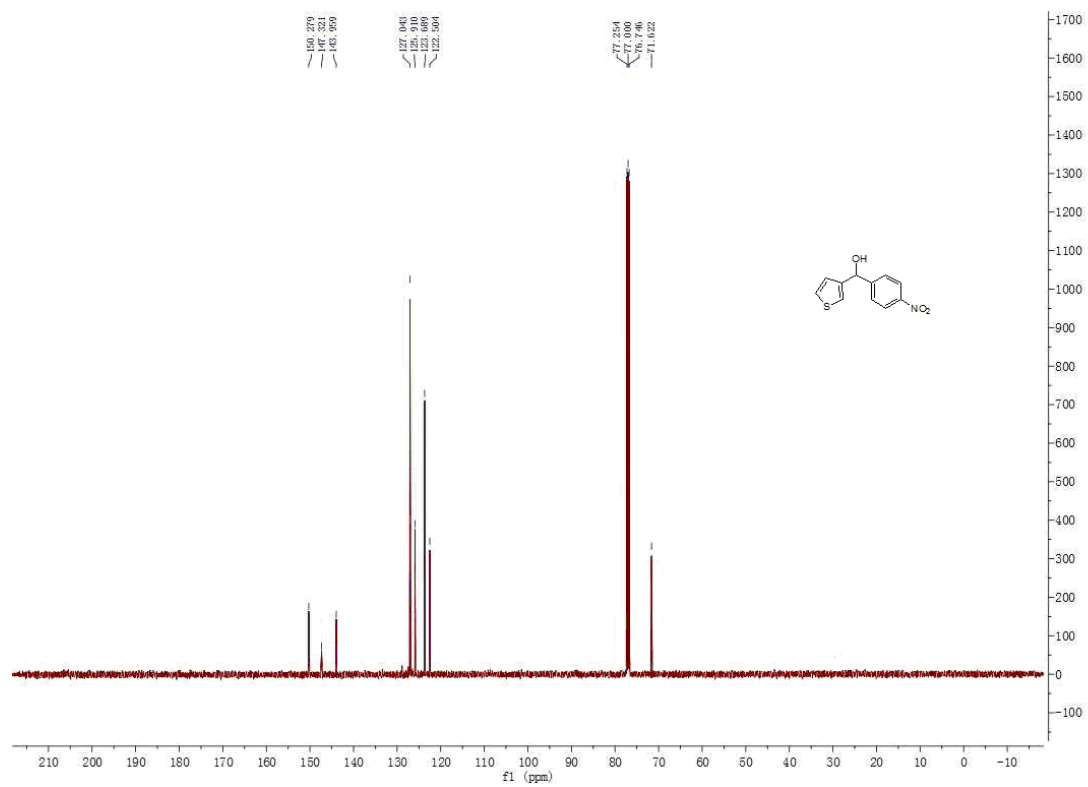


Figure S24. <sup>1</sup>H NMR of **3x** (500 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3x** (125 MHz, CDCl<sub>3</sub>).





**Figure S25.**  $^1\text{H}$  NMR of **3y** (500 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3y** (125 MHz,  $\text{CDCl}_3$ ).