

## A General and Efficient Synthesis of Pyrazoles Catalyzed by $\text{Sc}(\text{OTf})_3$ under Solvent-Free Conditions

Wei Xiong,<sup>a</sup> Jiu-Xi Chen,<sup>a</sup> Miao-Chang Liu,<sup>a</sup> Jin-Chang Ding,<sup>a</sup> Hua-Yue Wu<sup>\*,a</sup> and Wei-Ke Su<sup>\*,a,b</sup>

<sup>a</sup>College of Chemistry and Materials Engineering, Wenzhou University, 325027 Wenzhou, China

<sup>b</sup>Zhejiang Key Laboratory of Pharmaceutical Engineering, College of Pharmaceutical Sciences, Zhejiang University of Technology, 310014 Hangzhou, P. R., China

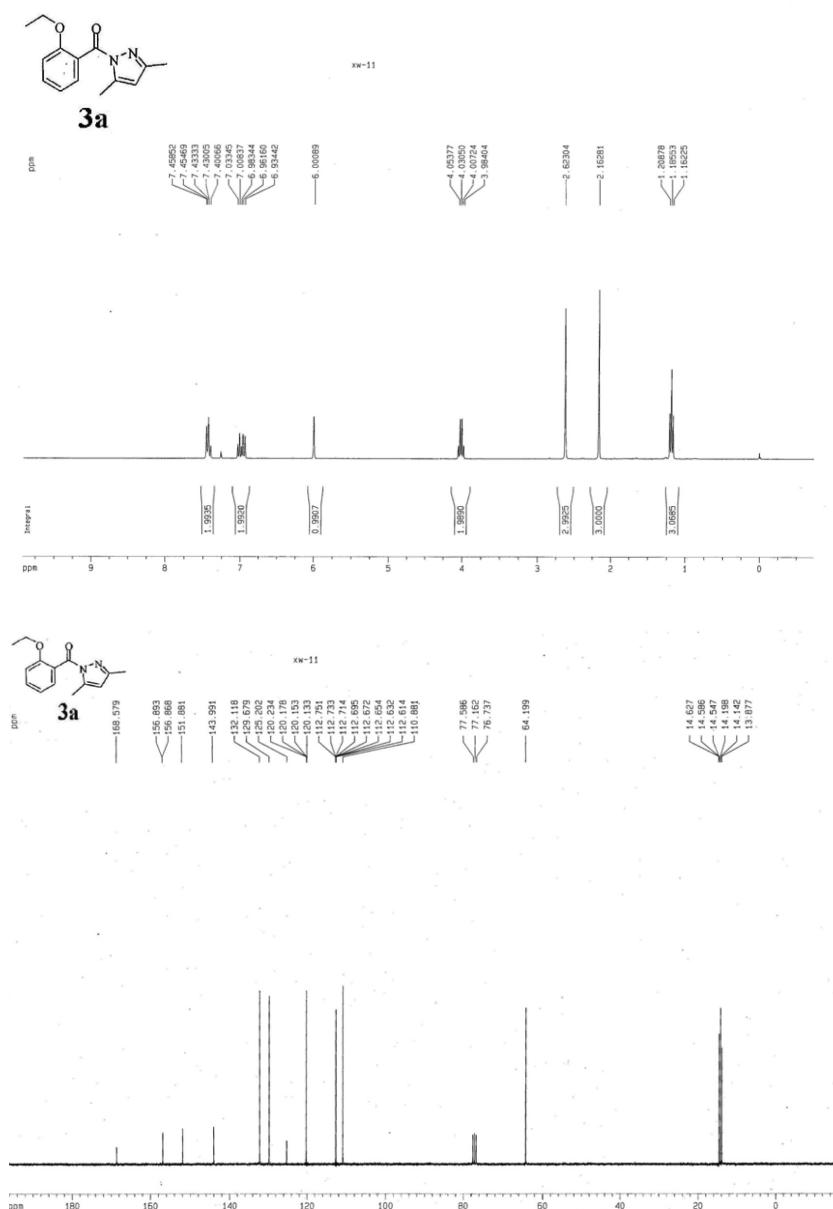
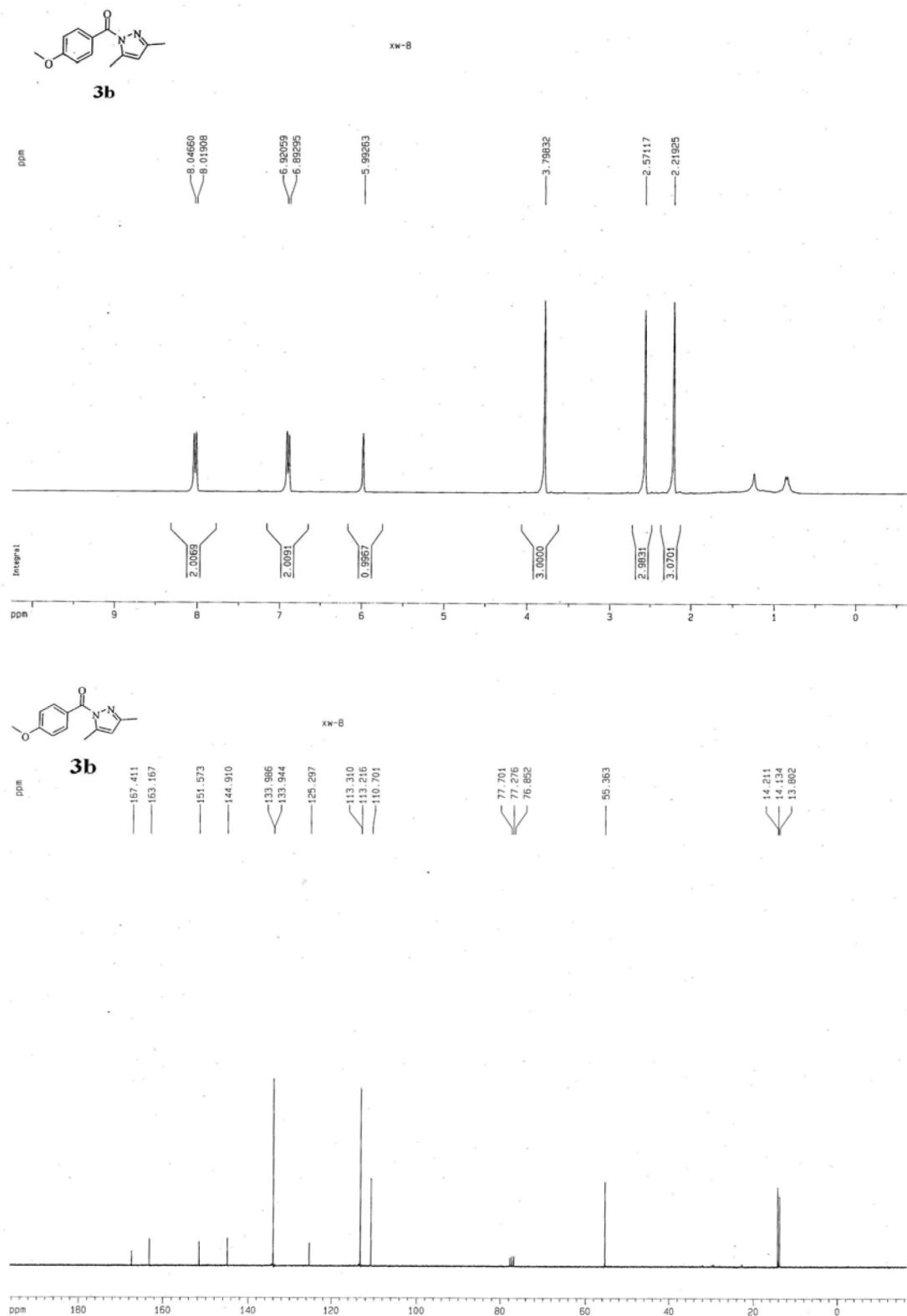
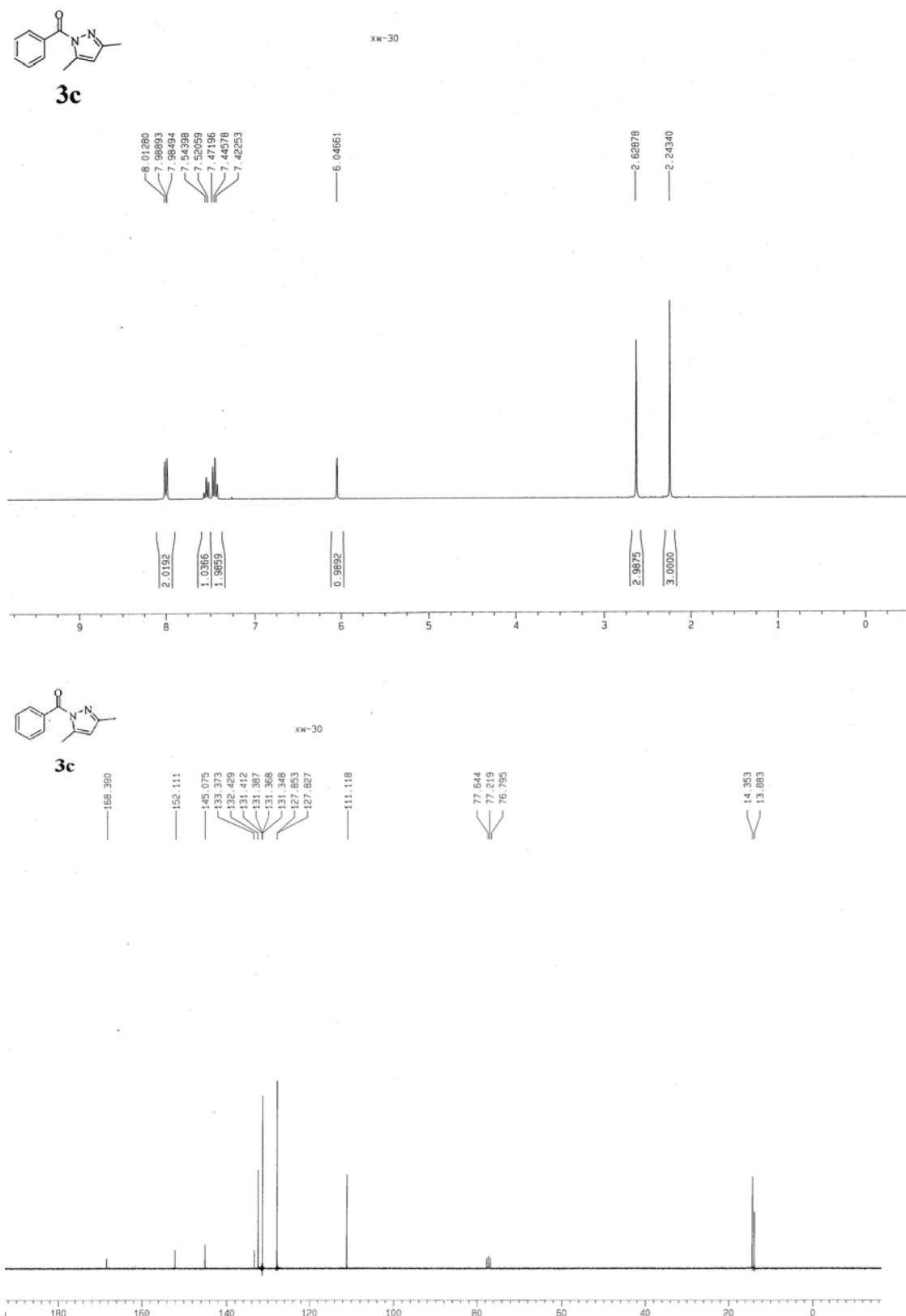


Figure S1. <sup>1</sup>H NMR of 3a (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of 3a (75 MHz, CDCl<sub>3</sub>).

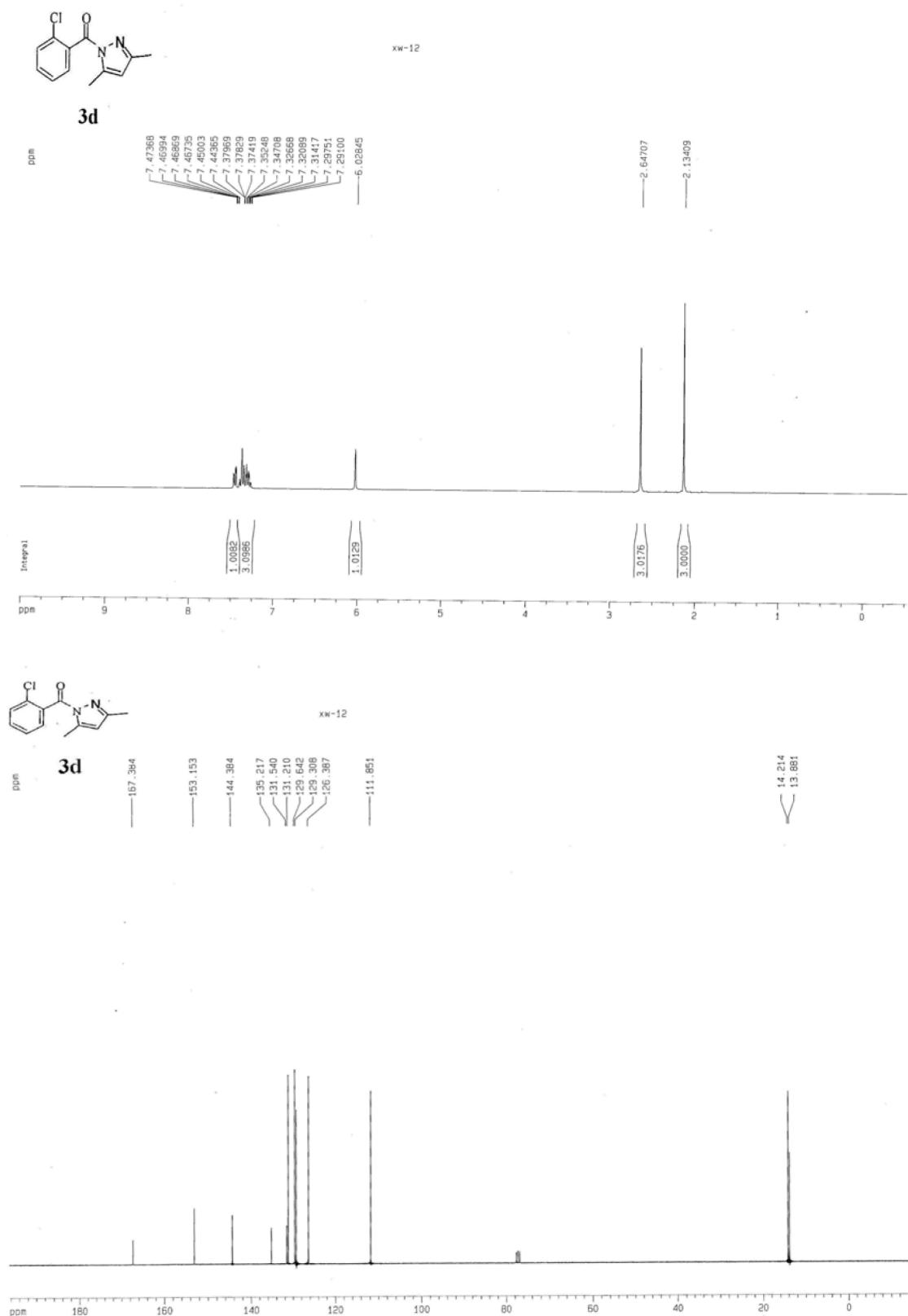
\*e-mail: huayuewu@wzu.edu.cn; suweike@zjut.edu.cn



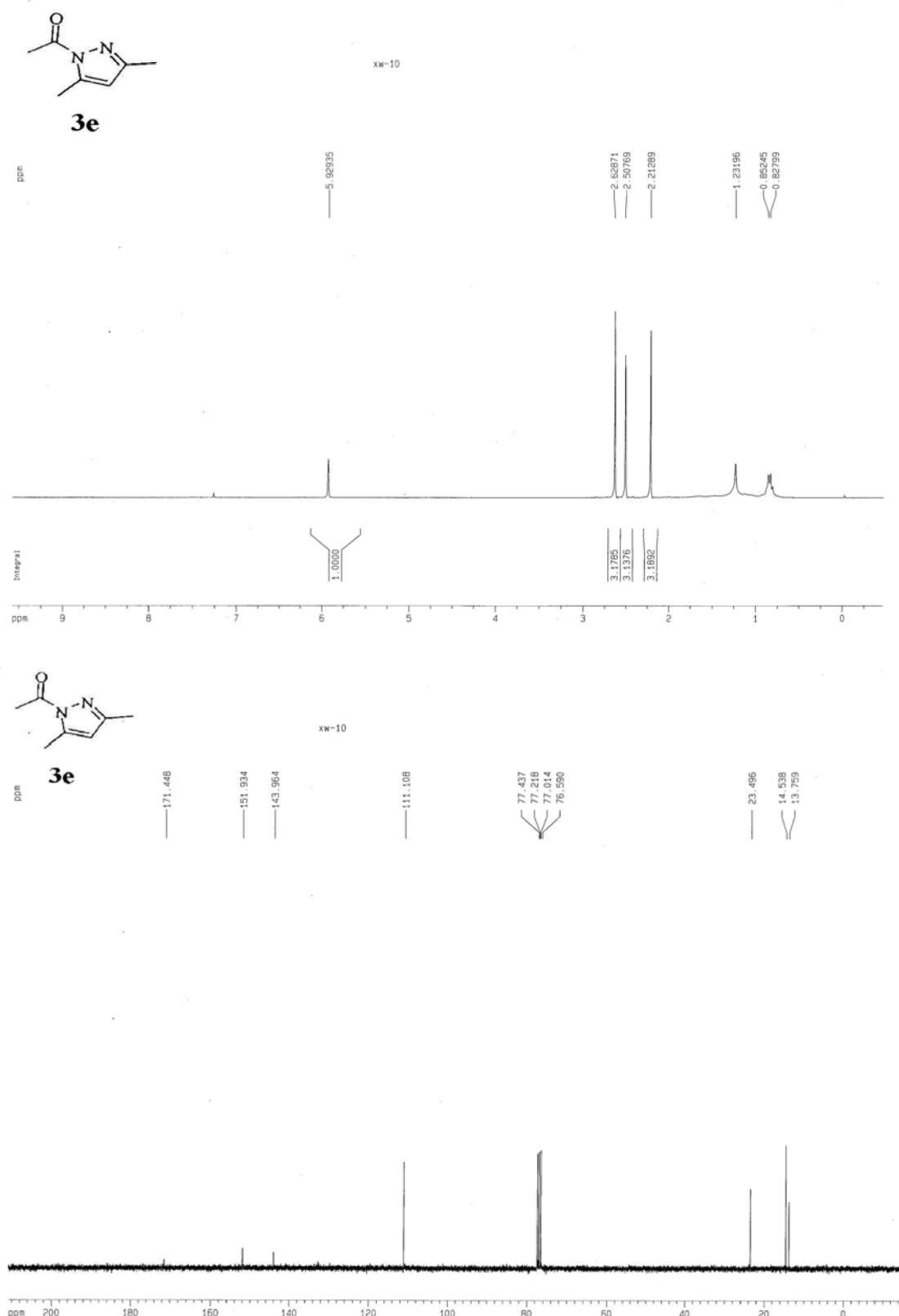
**Figure S2.**  $^1\text{H}$  NMR of **3b** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3b** (75 MHz,  $\text{CDCl}_3$ ).



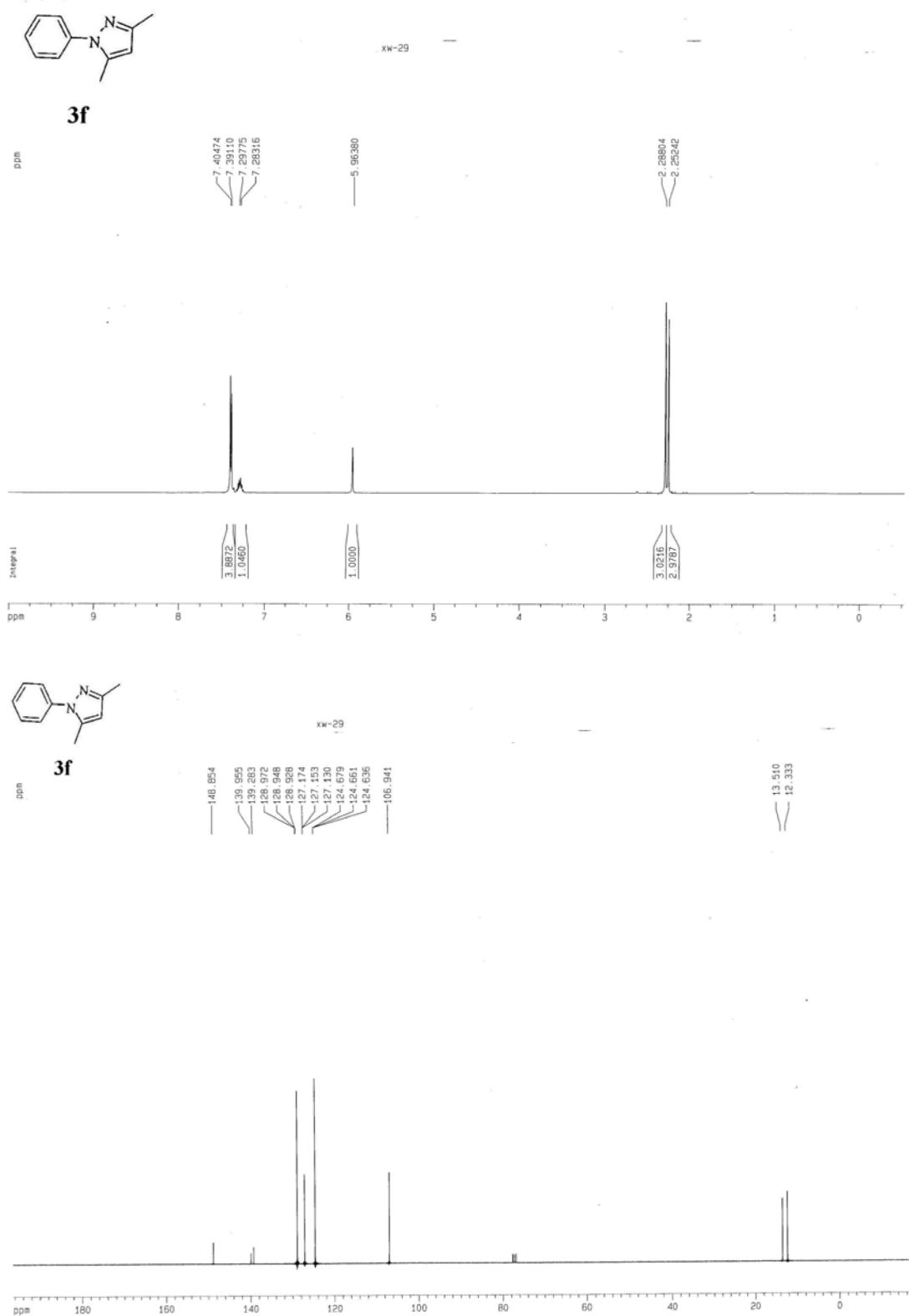
**Figure S3.** <sup>1</sup>H NMR of **3c** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3c** (75 MHz, CDCl<sub>3</sub>).



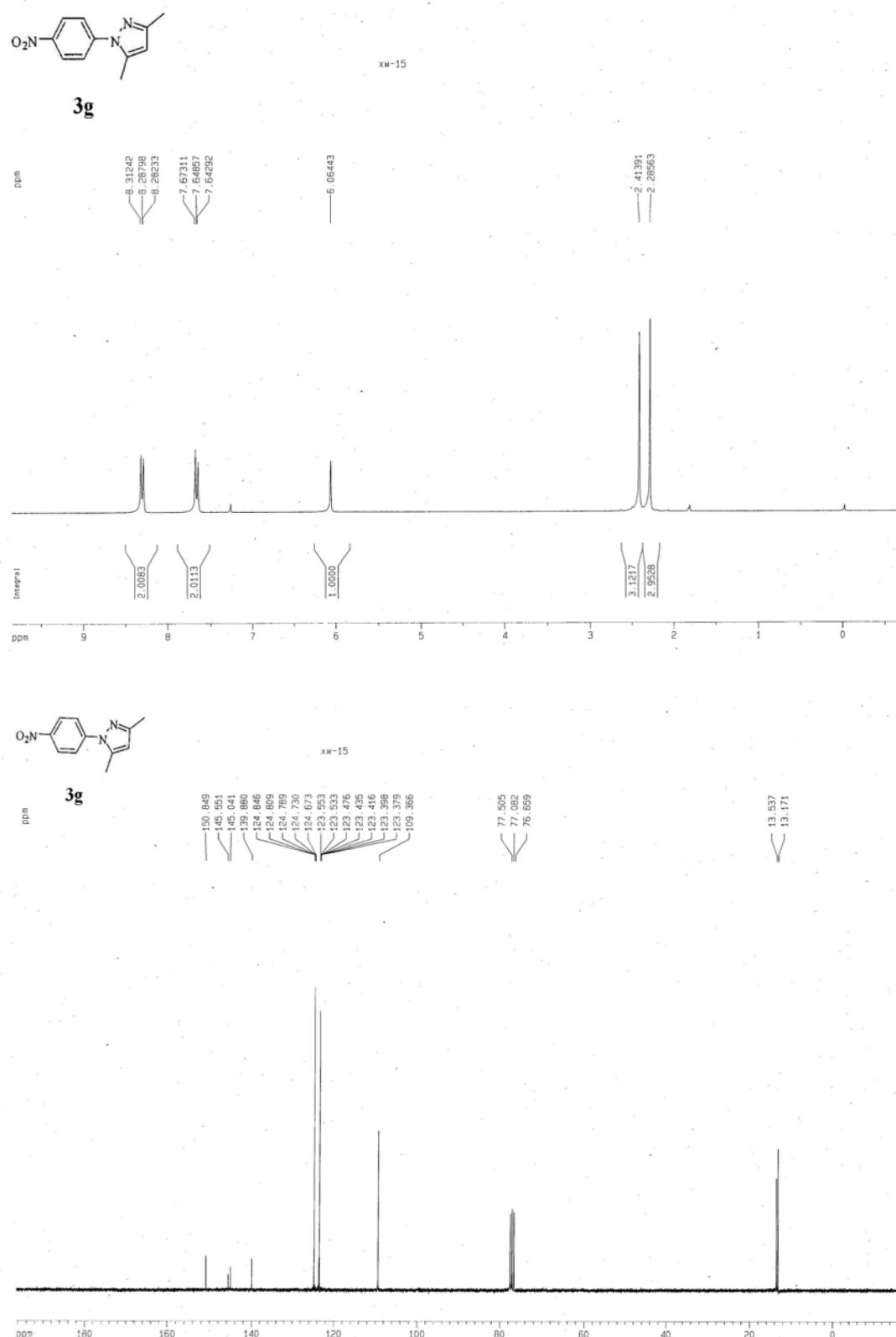
**Figure S4.**  $^1\text{H}$  NMR of **3d** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3d** (75 MHz,  $\text{CDCl}_3$ ).



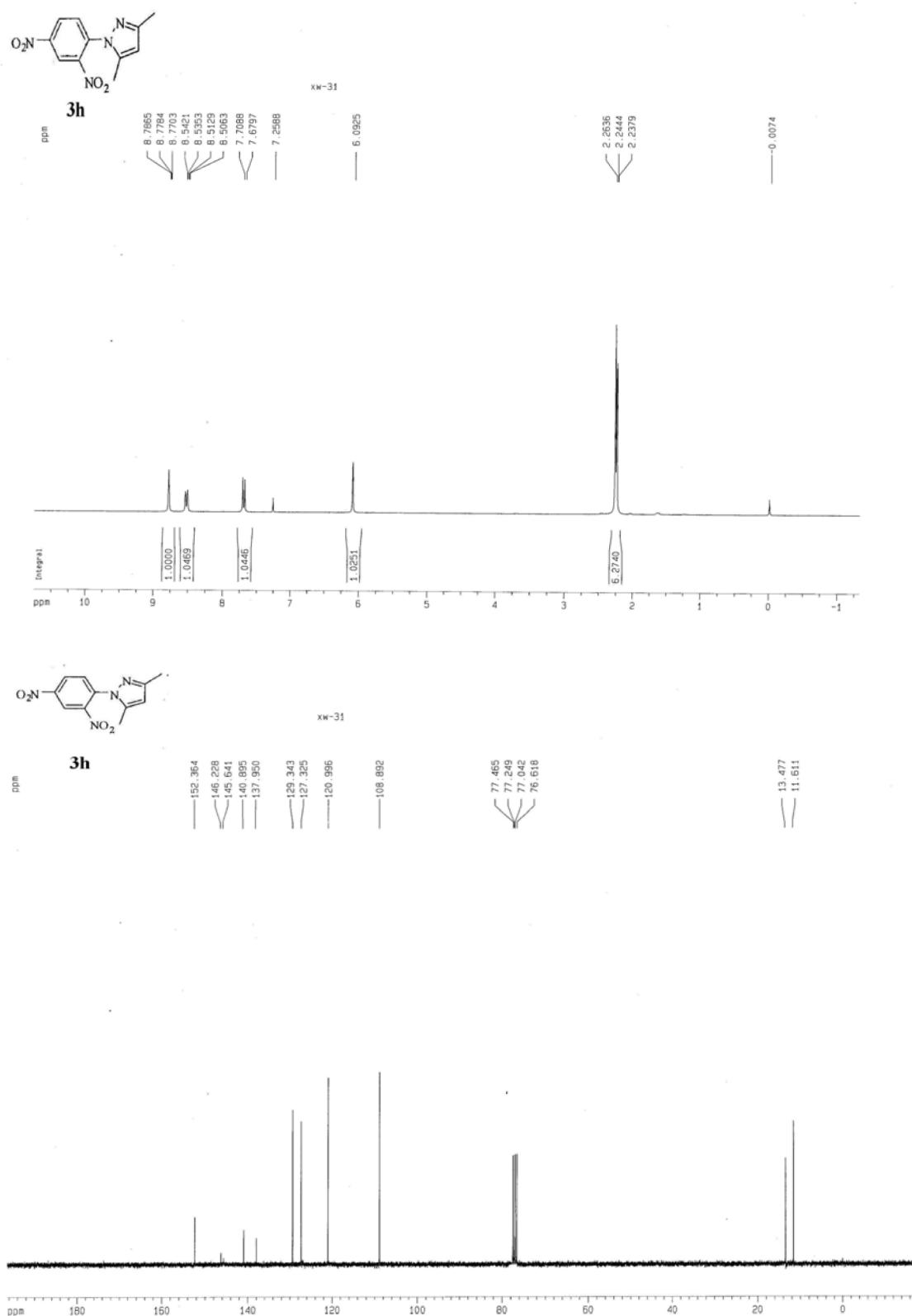
**Figure S5.** <sup>1</sup>H NMR of **3e** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3e** (75 MHz, CDCl<sub>3</sub>).



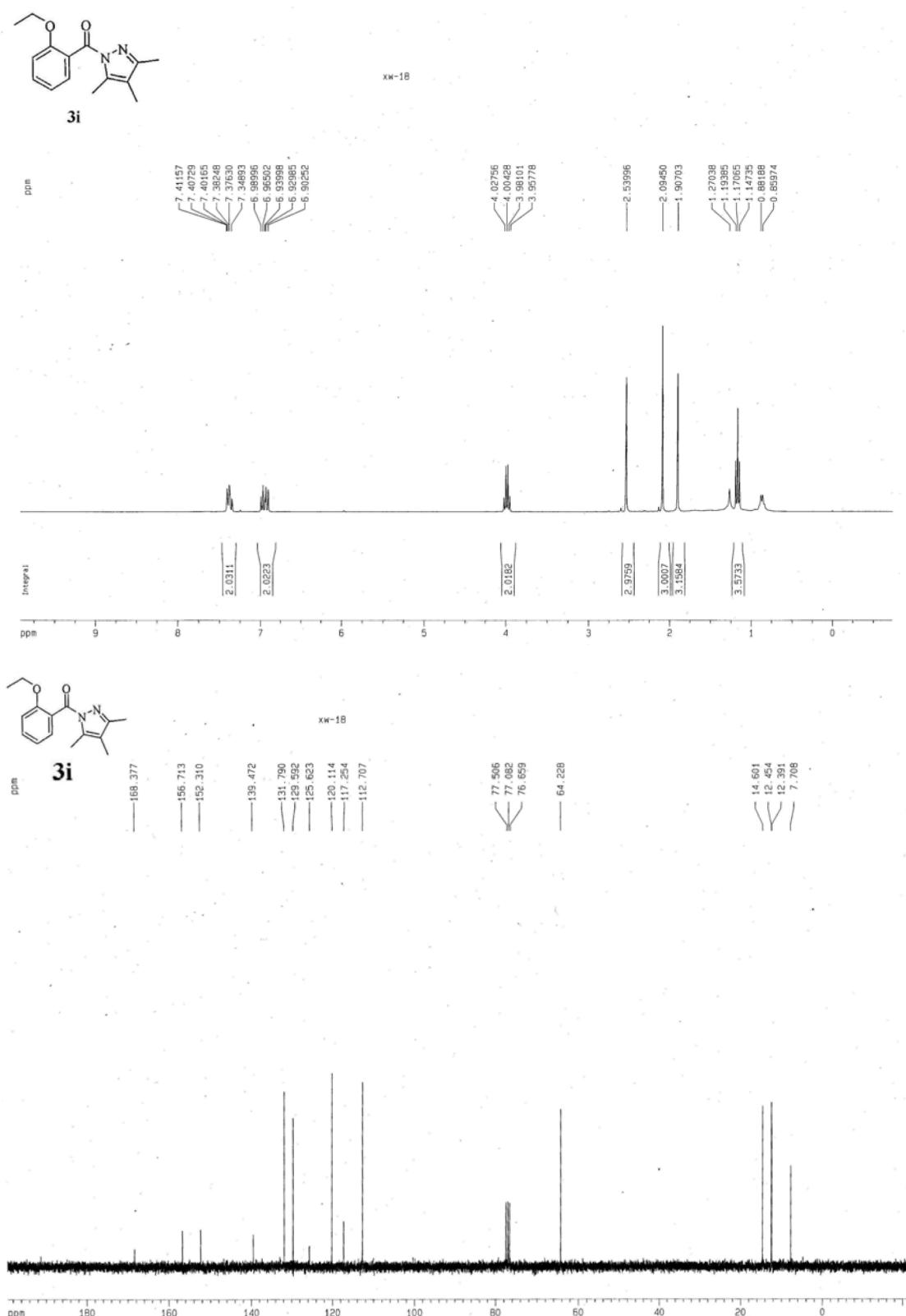
**Figure S6.**  $^1\text{H}$  NMR of **3f** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3f** (75 MHz,  $\text{CDCl}_3$ ).



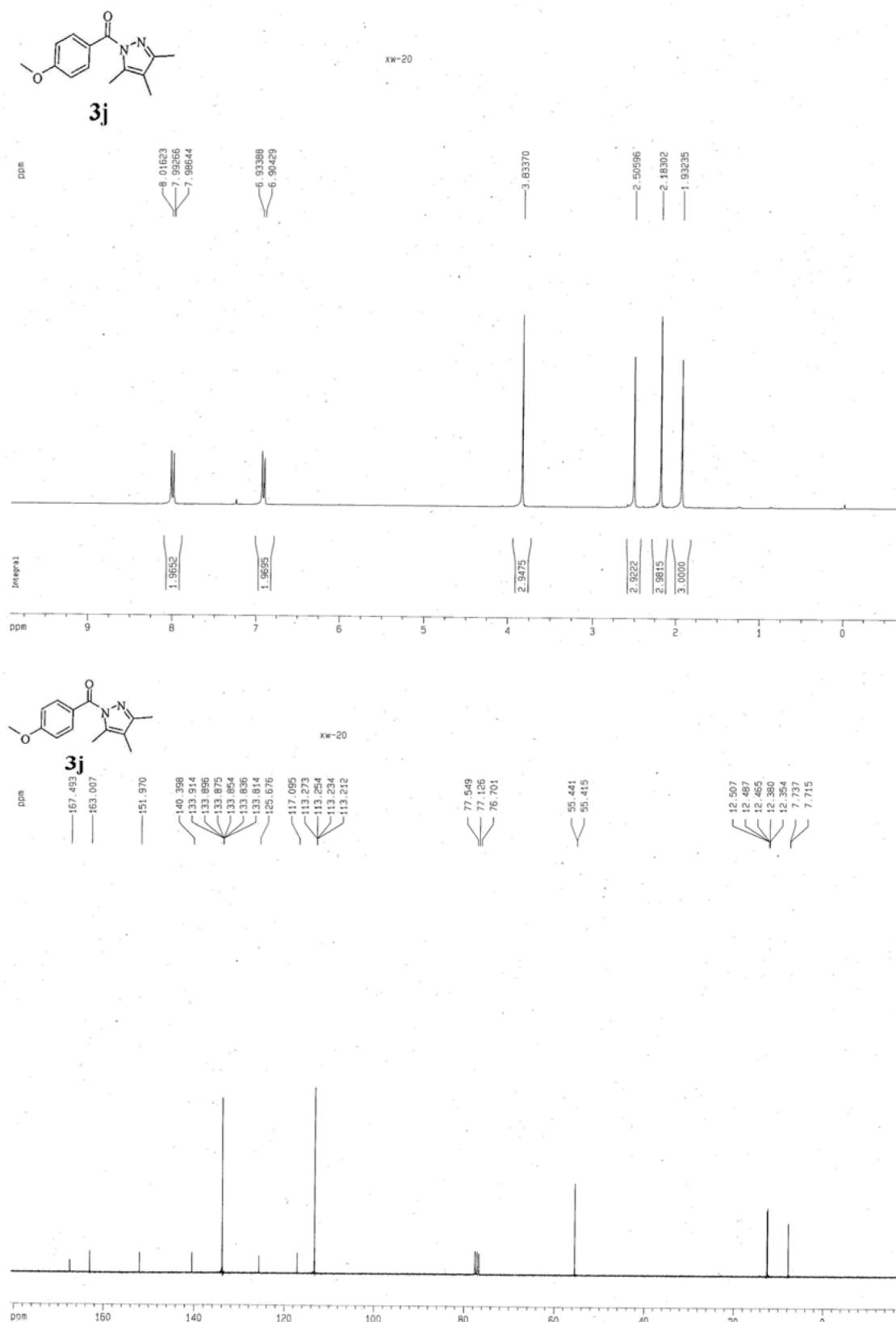
**Figure S7.** <sup>1</sup>H NMR of **3g** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3g** (75 MHz, CDCl<sub>3</sub>).



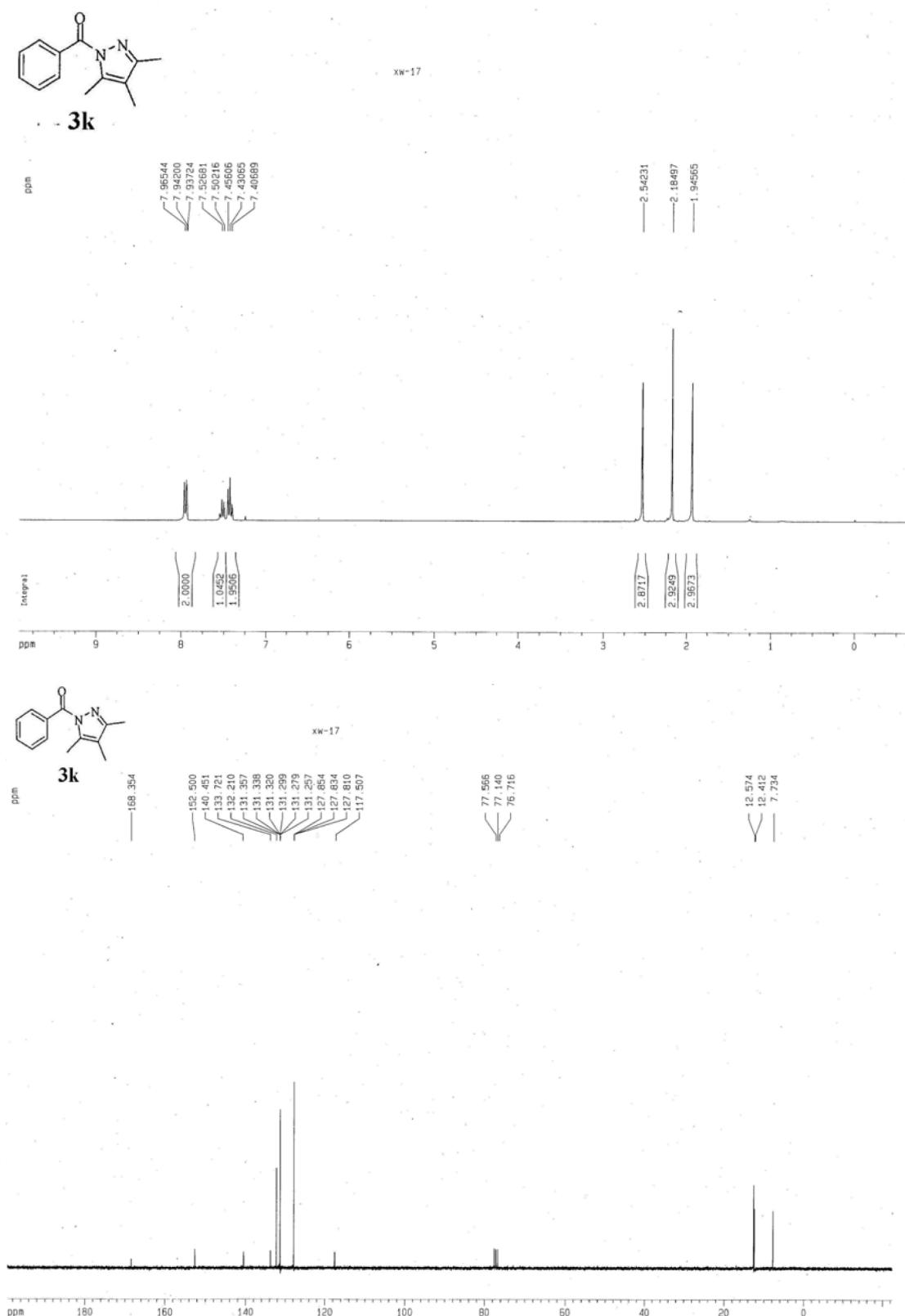
**Figure S8.**  $^1\text{H}$  NMR of **3h** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3h** (75 MHz,  $\text{CDCl}_3$ ).



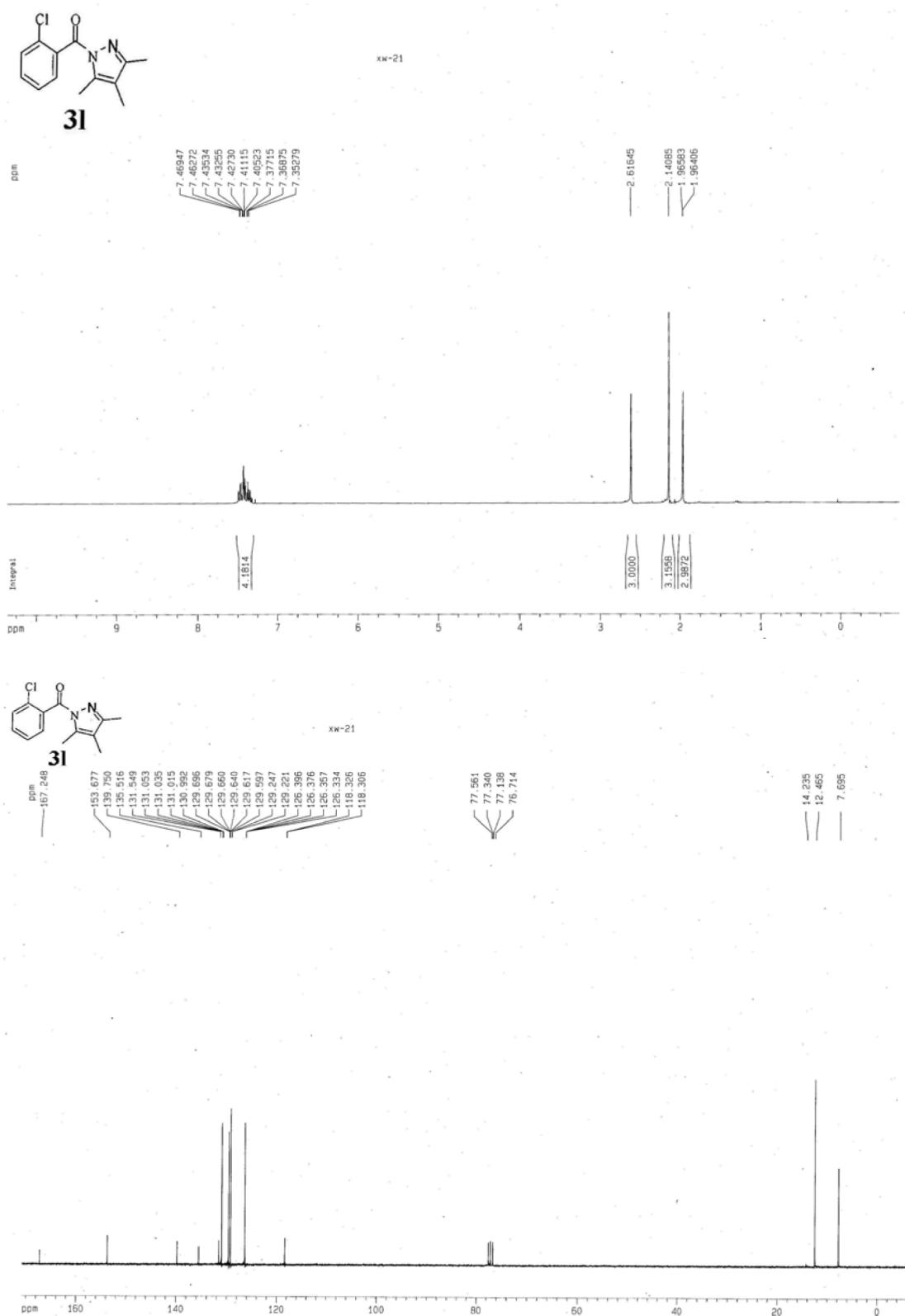
**Figure S9.** <sup>1</sup>H NMR of **3i** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3i** (75 MHz, CDCl<sub>3</sub>).



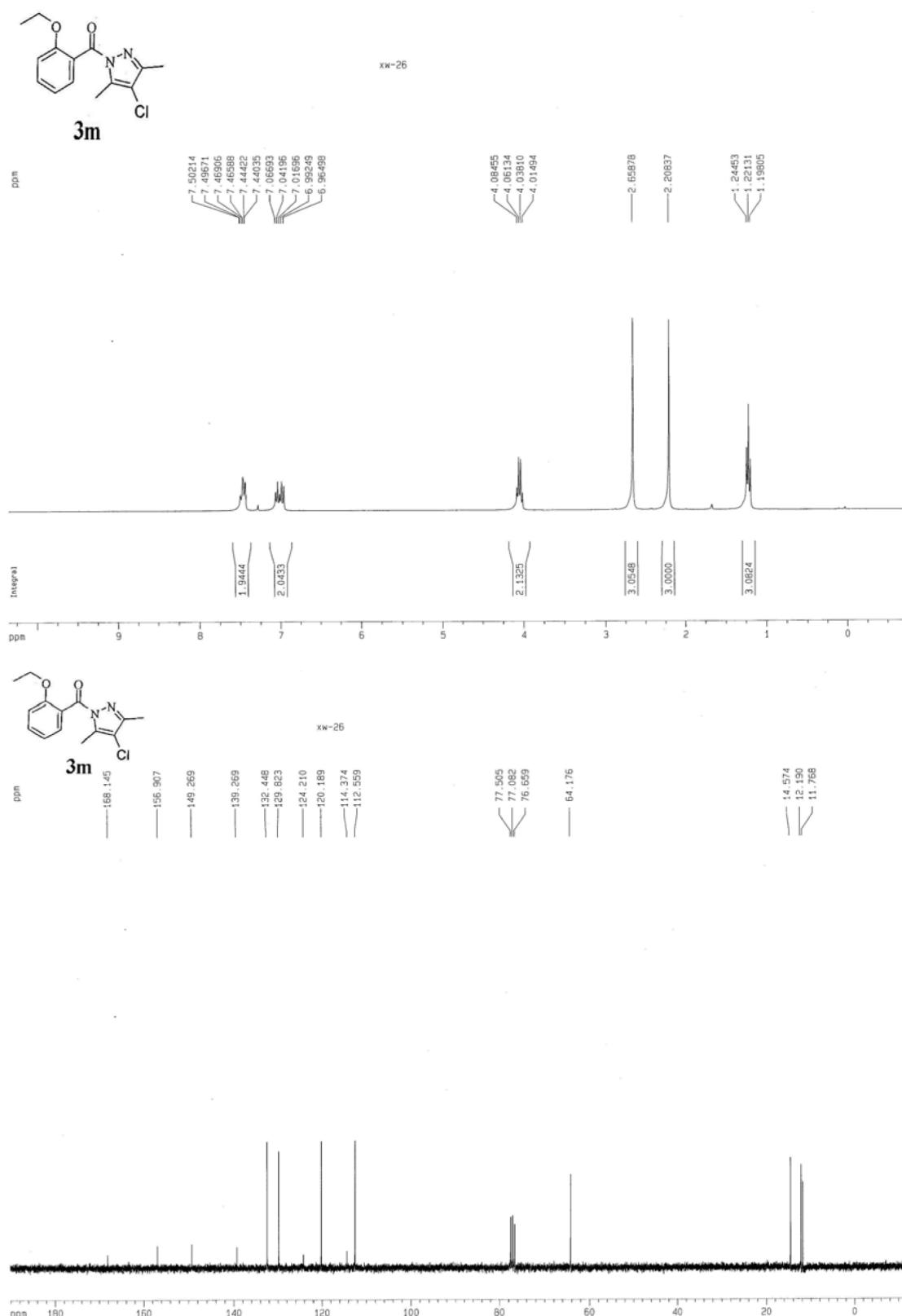
**Figure S10.**  $^1\text{H}$  NMR of **3j** (300 MHz, CDCl<sub>3</sub>) and  $^{13}\text{C}$  NMR of **3j** (75 MHz, CDCl<sub>3</sub>).



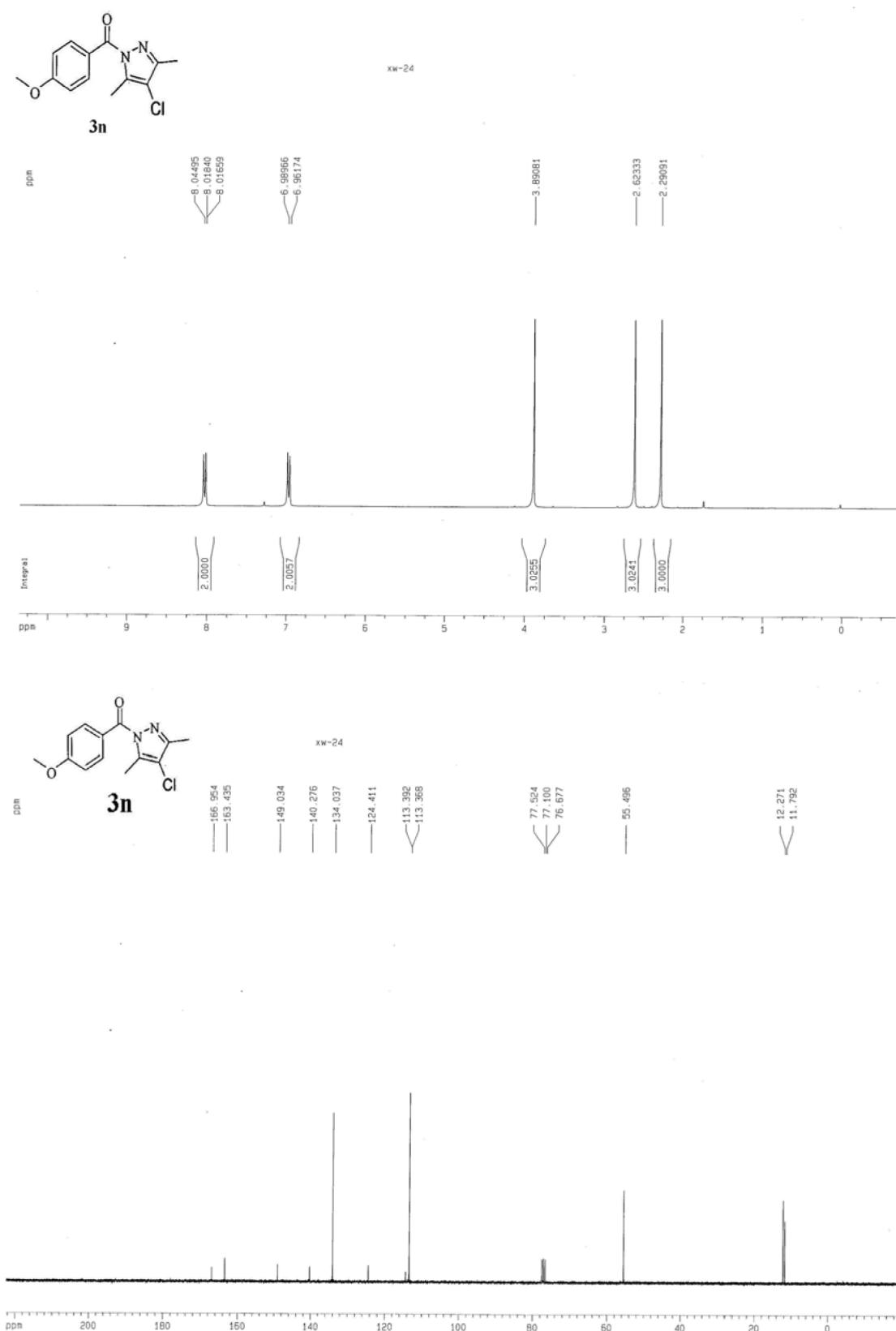
**Figure S11.**  $^1\text{H}$  NMR of **3k** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3k** (75 MHz,  $\text{CDCl}_3$ ).



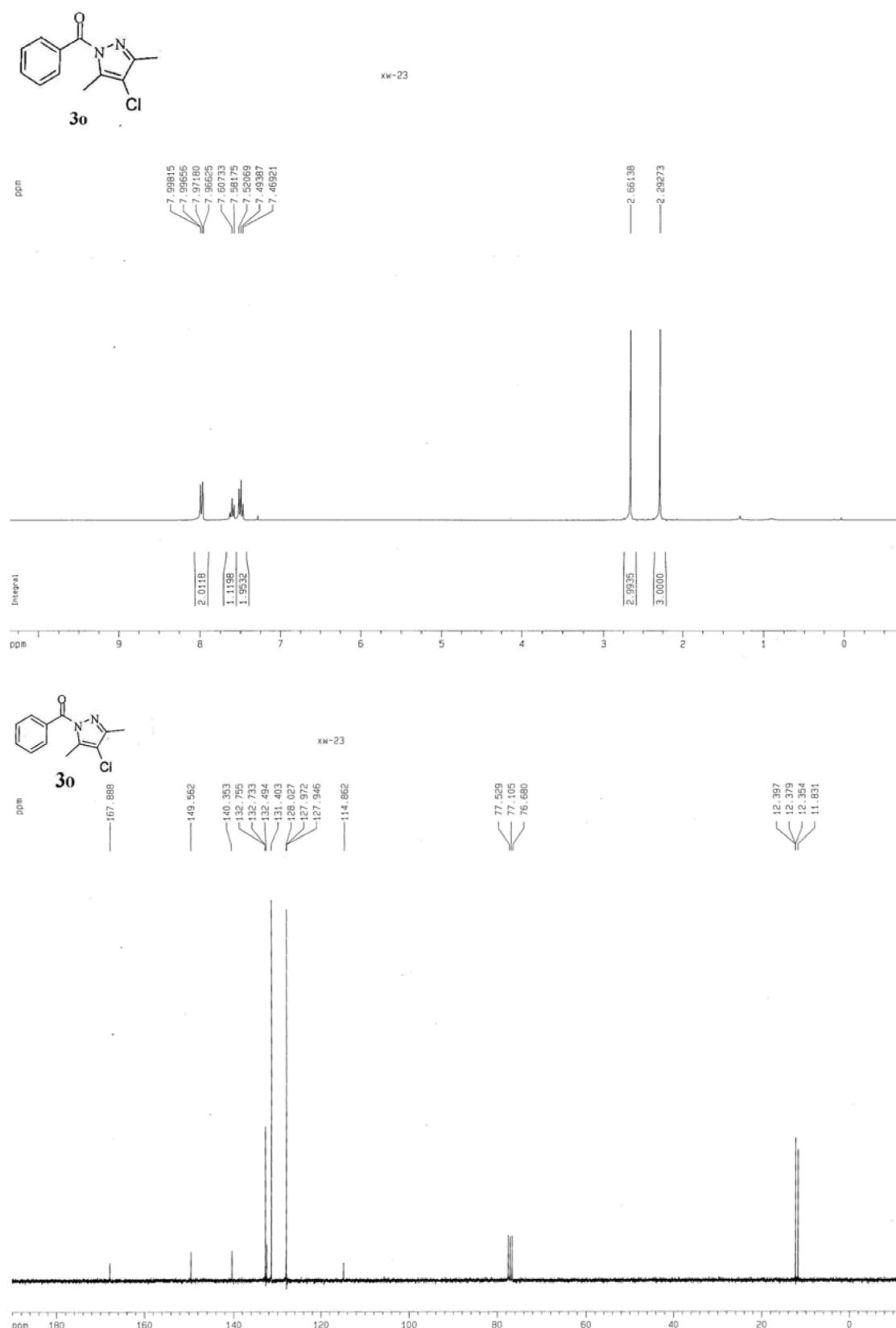
**Figure S12.**  $^1\text{H}$  NMR of **3l** (300 MHz, CDCl<sub>3</sub>) and  $^{13}\text{C}$  NMR of **3l** (75 MHz, CDCl<sub>3</sub>).



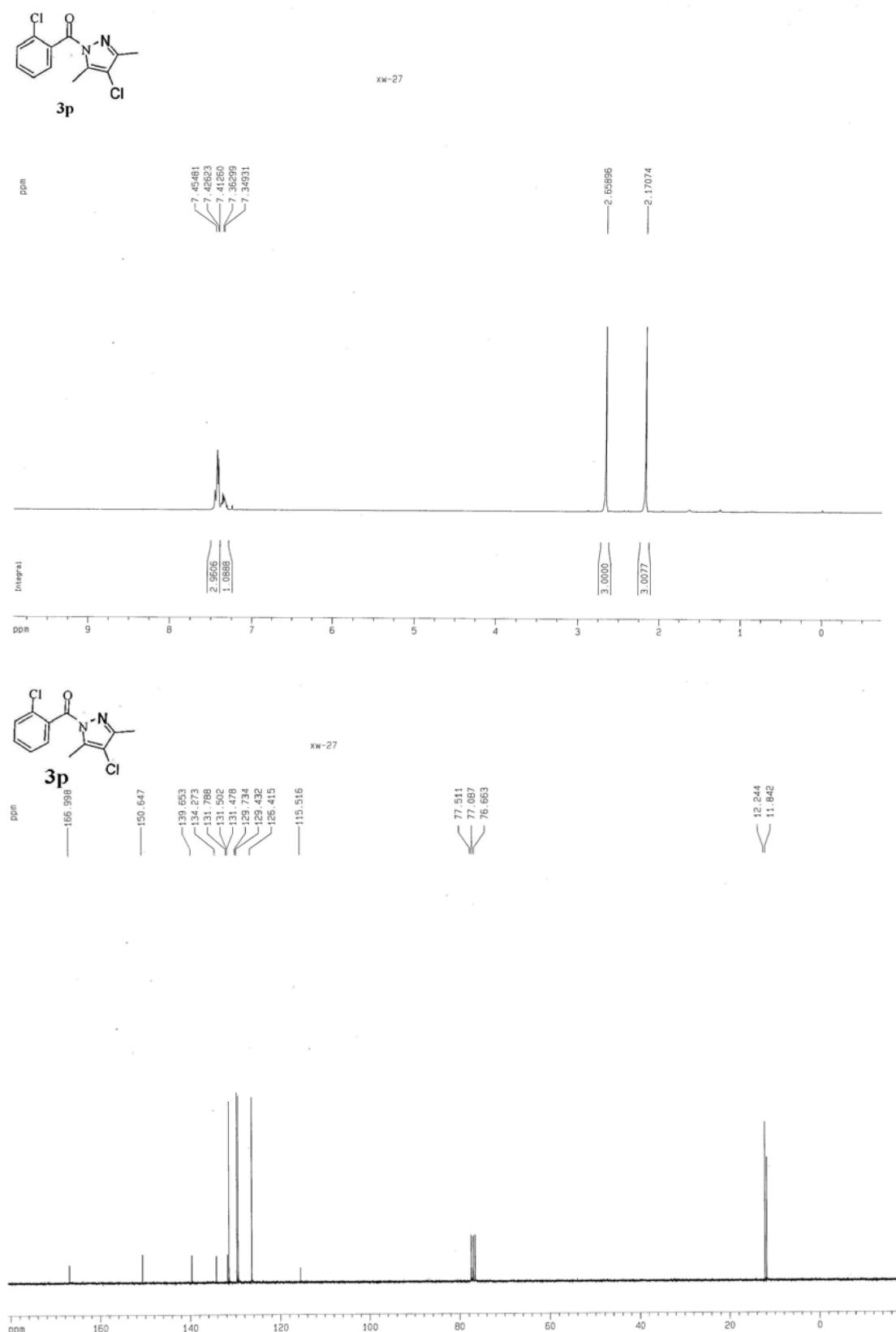
**Figure S13.** <sup>1</sup>H NMR of **3m** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3m** (75 MHz, CDCl<sub>3</sub>).



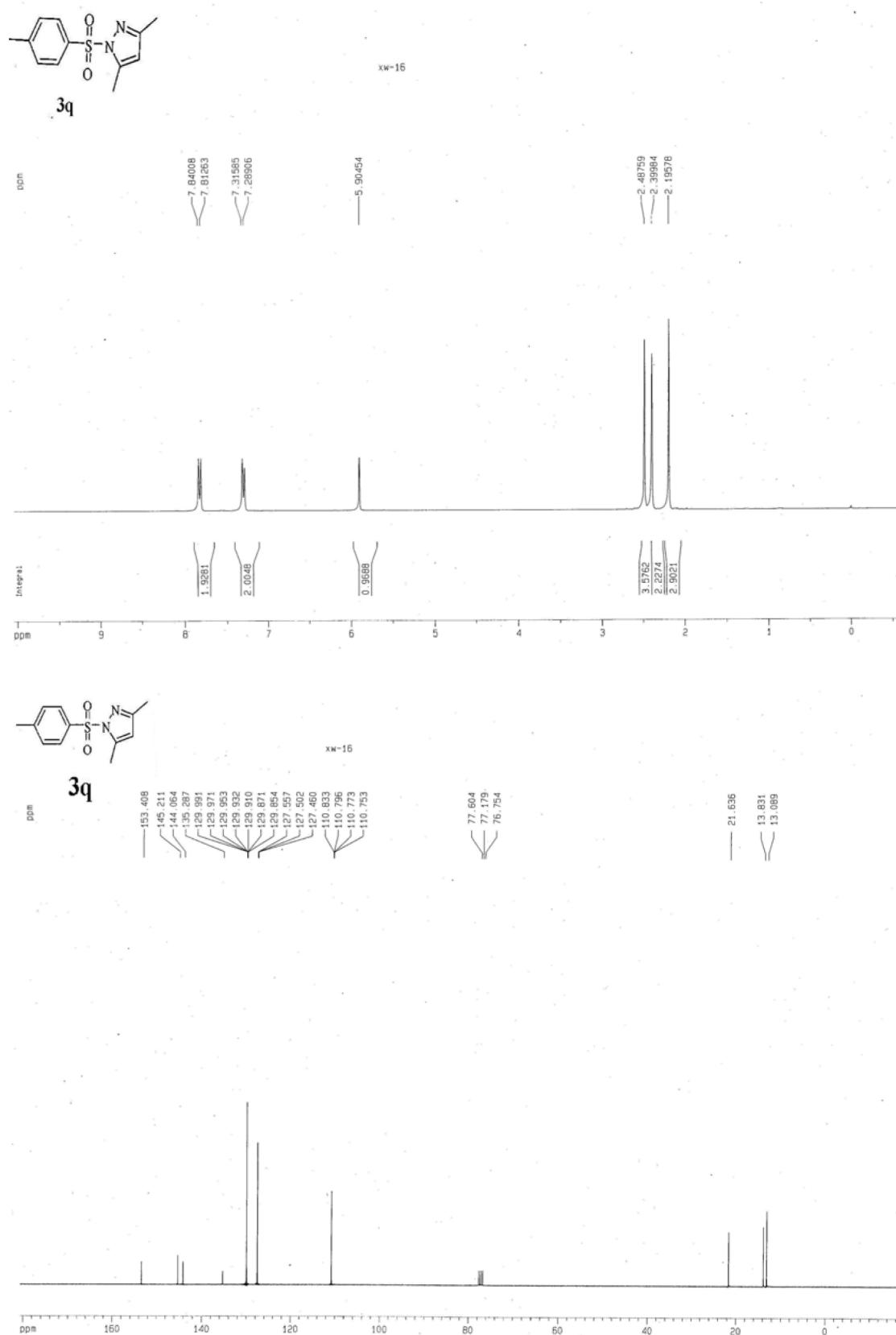
**Figure S14.**  $^1\text{H}$  NMR of **3n** (300 MHz, CDCl<sub>3</sub>) and  $^{13}\text{C}$  NMR of **3n** (75 MHz, CDCl<sub>3</sub>).



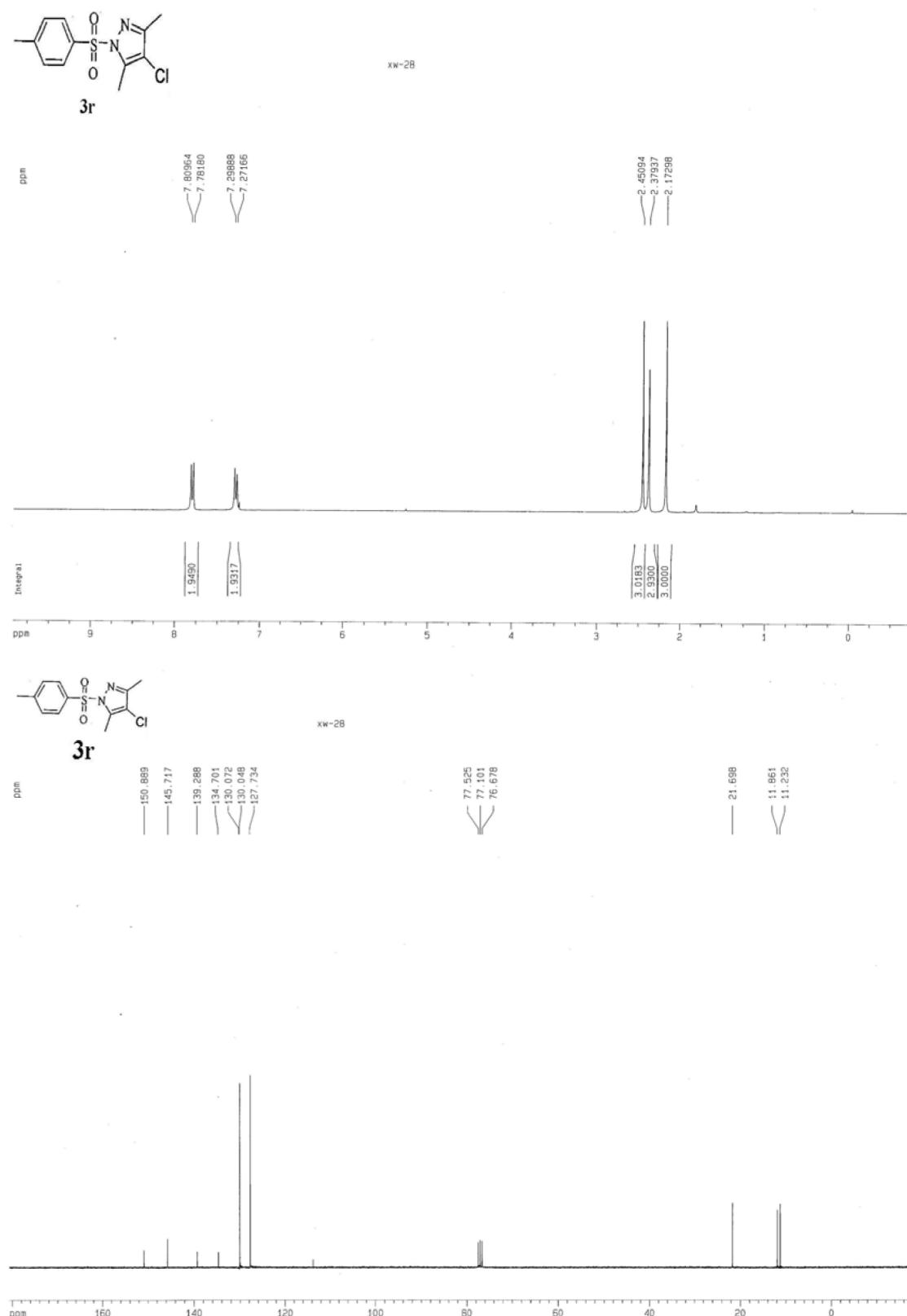
**Figure S15.** <sup>1</sup>H NMR of **3o** (300 MHz, CDCl<sub>3</sub>) and <sup>13</sup>C NMR of **3o** (75 MHz, CDCl<sub>3</sub>).



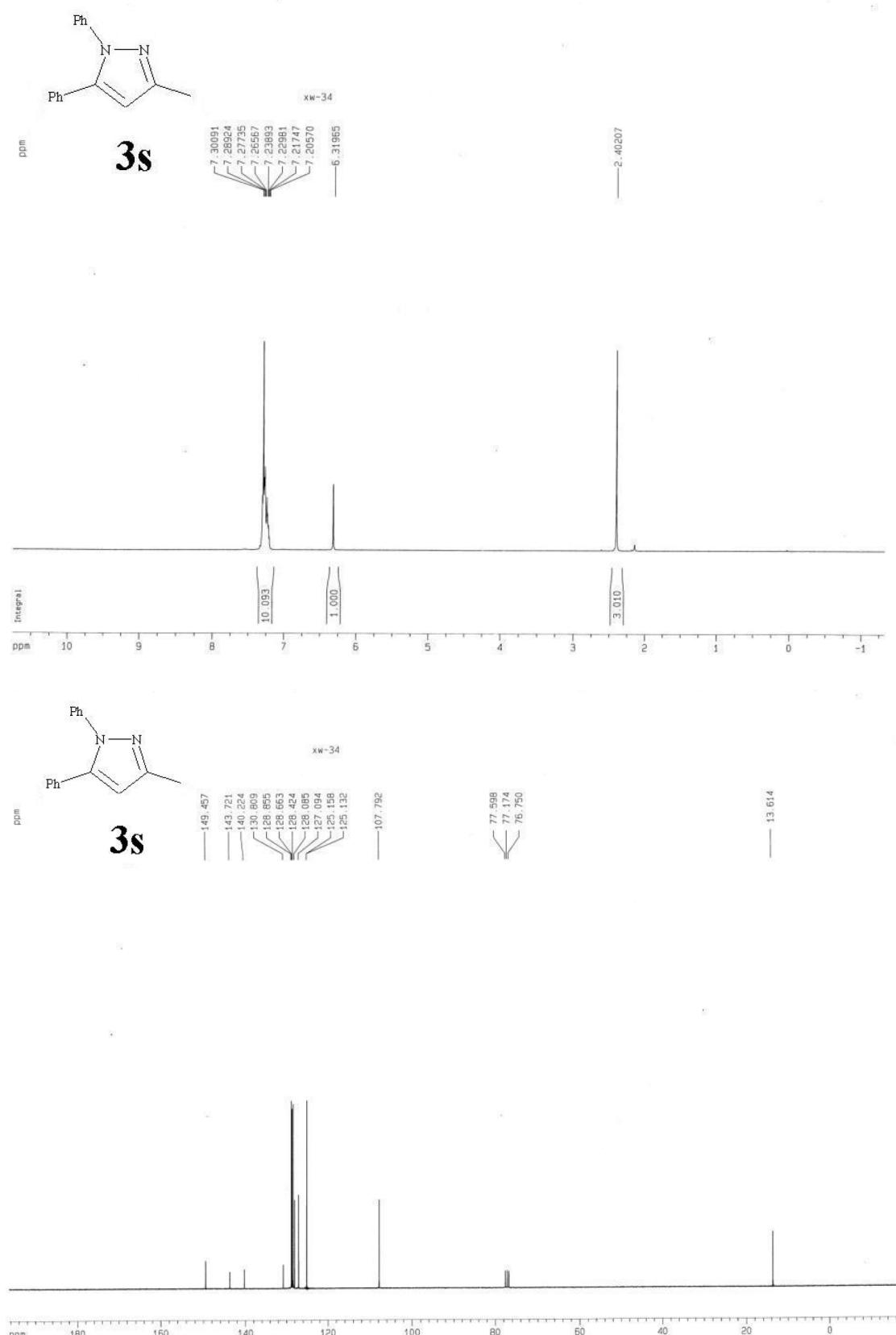
**Figure S16.**  $^1\text{H}$  NMR of **3p** (300 MHz, CDCl<sub>3</sub>) and  $^{13}\text{C}$  NMR of **3p** (75 MHz, CDCl<sub>3</sub>).



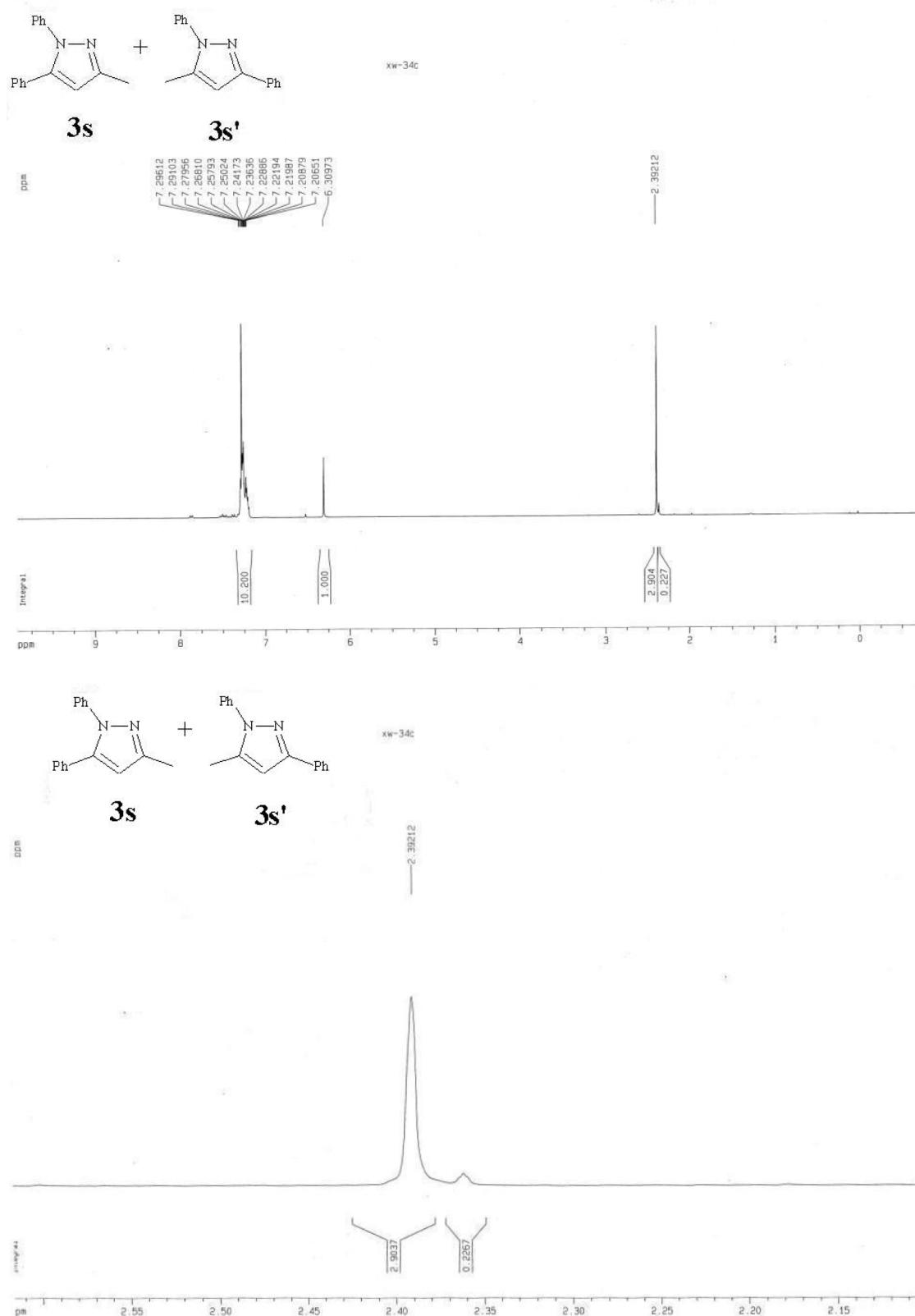
**Figure S17.**  $^1\text{H}$  NMR of **3q** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3q** (75 MHz,  $\text{CDCl}_3$ ).



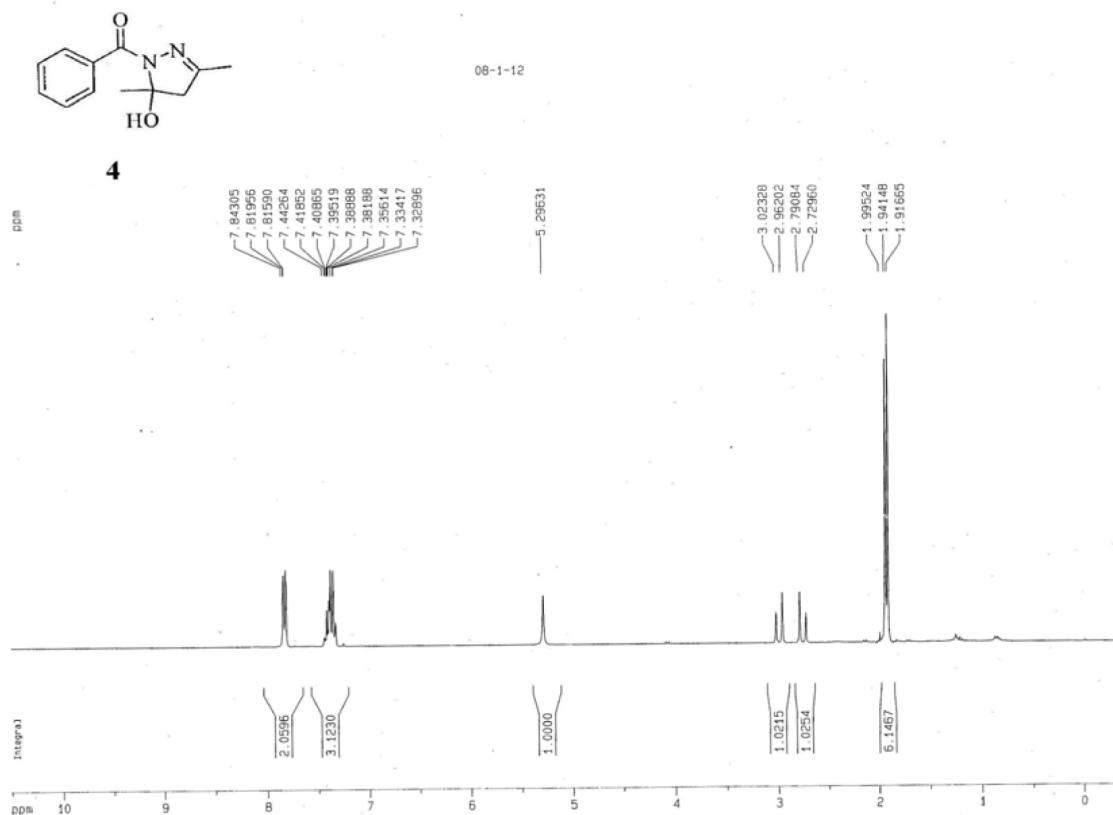
**Figure S18.**  $^1\text{H}$  NMR of **3r** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3r** (75 MHz,  $\text{CDCl}_3$ ).



**Figure S19.**  $^1\text{H}$  NMR of **3s** (300 MHz,  $\text{CDCl}_3$ ) and  $^{13}\text{C}$  NMR of **3s** (75 MHz,  $\text{CDCl}_3$ ).



**Figure S20.**  $^1\text{H}$  NMR of **3s+3s'** (300 MHz,  $\text{CDCl}_3$ ).



**Figure S21.** <sup>1</sup>H NMR of **4** (300 MHz, CDCl<sub>3</sub>).