

SUPPLEMENTARY MATERIAL

**Synthesis of a novel diol-functionalized poly (ethylene glycol) bridged dicationic ionic liquid and its application in copper-catalyzed amination of aryl halides**

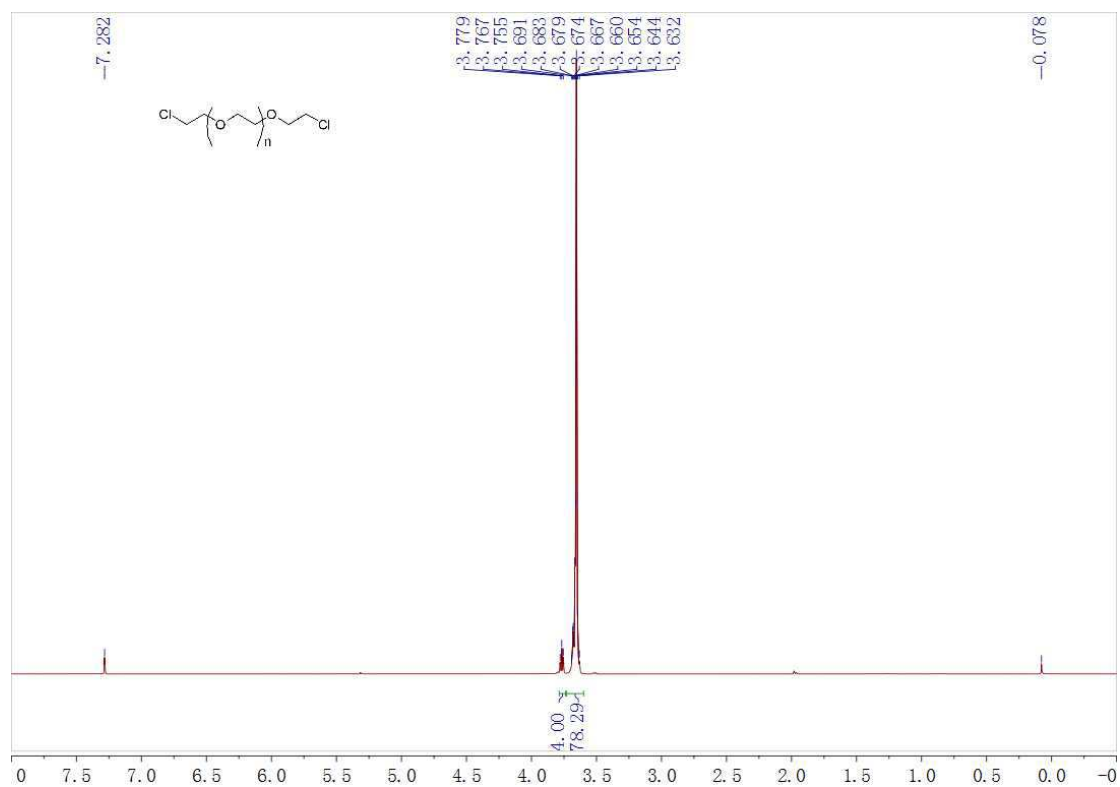
Yinglei Wang, Jun Luo\*, Tianjiao Hou, Zuliang Liu

School of Chemical Engineering, Nanjing University of Science and Technology, Nanjing 210094, China

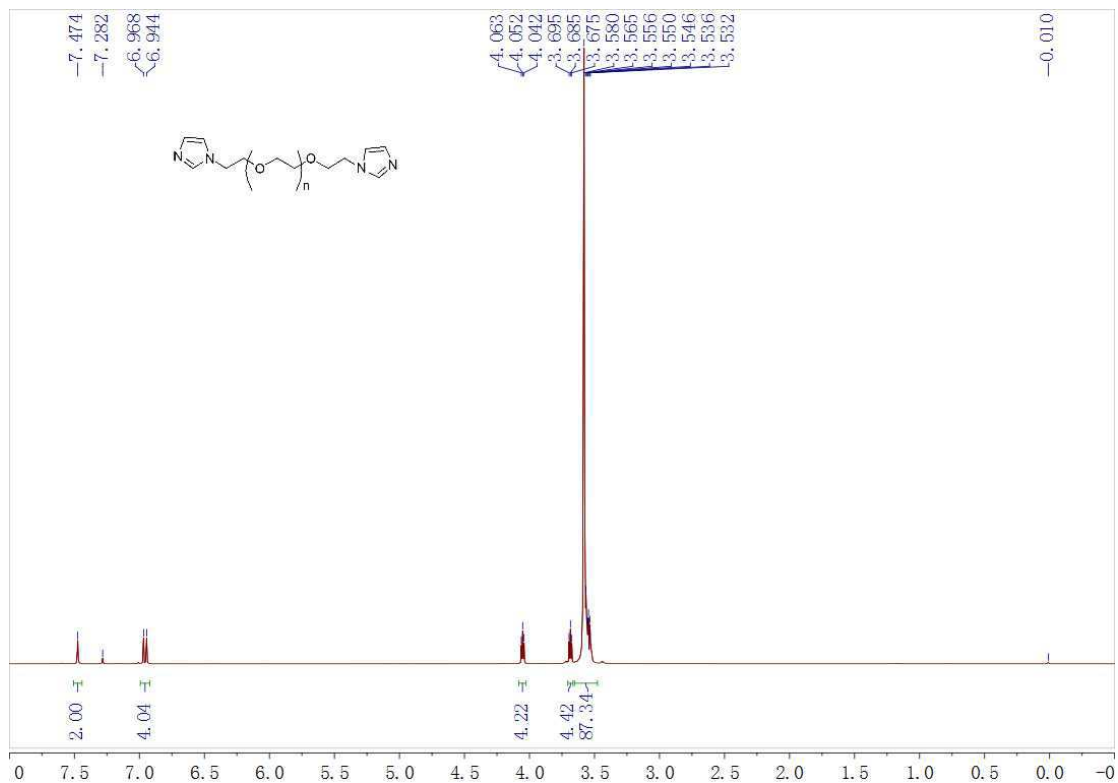
E-mail: luojun@njust.edu.cn

<b>Table of Contents</b>	<b>Page</b>
<sup>1</sup> H-NMR spectra of PEG dichloride (1)	S2
<sup>1</sup> H-NMR spectra of PEG bridged di-imidazolium compound (2)	S2
<sup>1</sup> H-NMR and <sup>13</sup> C-NMR spectra of [diol-PEG-DIL][PF <sub>6</sub> ]	S3
The FT-IR spectrum of [diol-PEG-DIL][PF <sub>6</sub> ]	S4
ESI-MS for the cation of [diol-PEG-DIL][PF <sub>6</sub> ]	S5
ESI-MS for the anion of [diol-PEG-DIL][PF <sub>6</sub> ]	S6
<sup>1</sup> H-NMR and <sup>13</sup> C-NMR spectra of aromatic amines	S7-S19

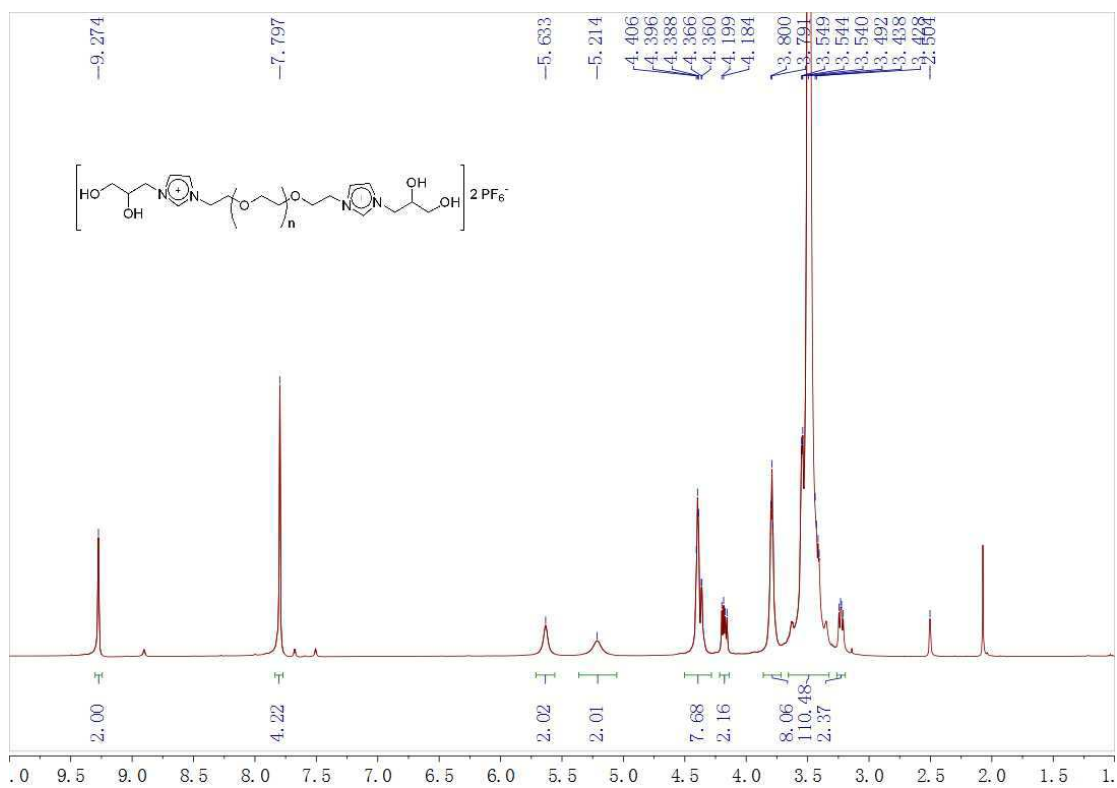
$^1\text{H-NMR}$  spectra of PEG dichloride (**1**) in  $\text{CDCl}_3$ :

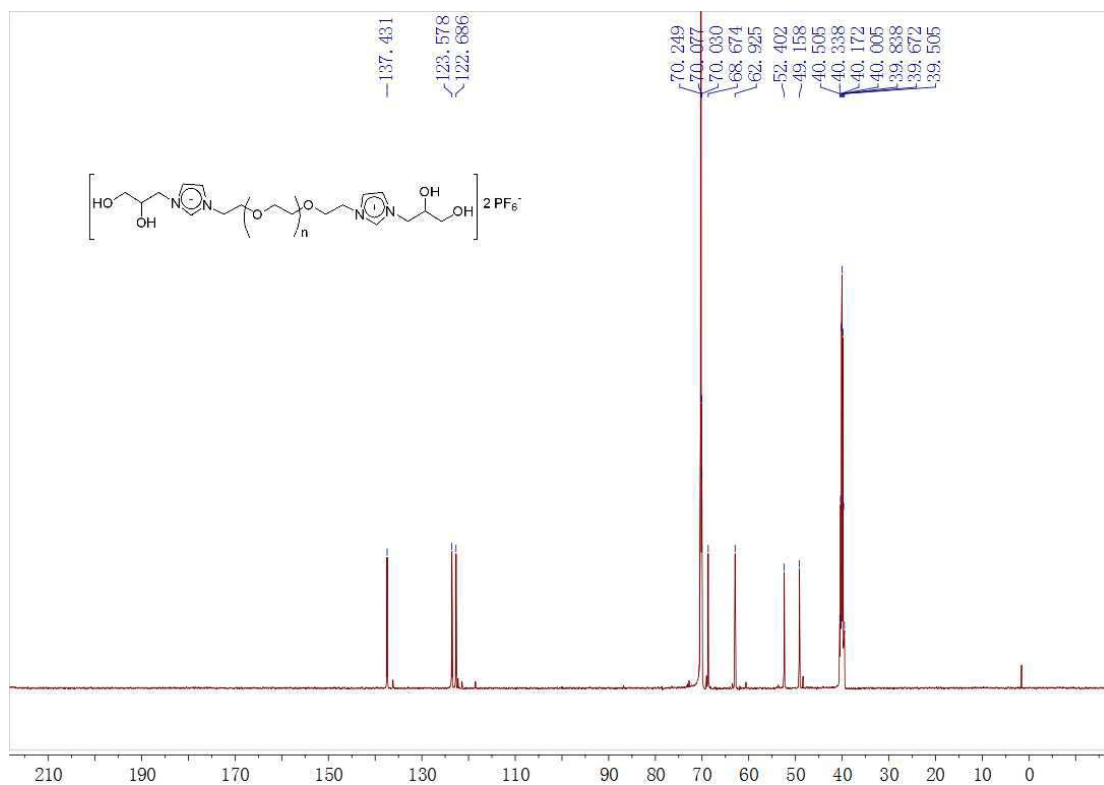


$^1\text{H-NMR}$  spectra of PEG bridged di-imidazolium compound (**2**) in  $\text{CDCl}_3$ :

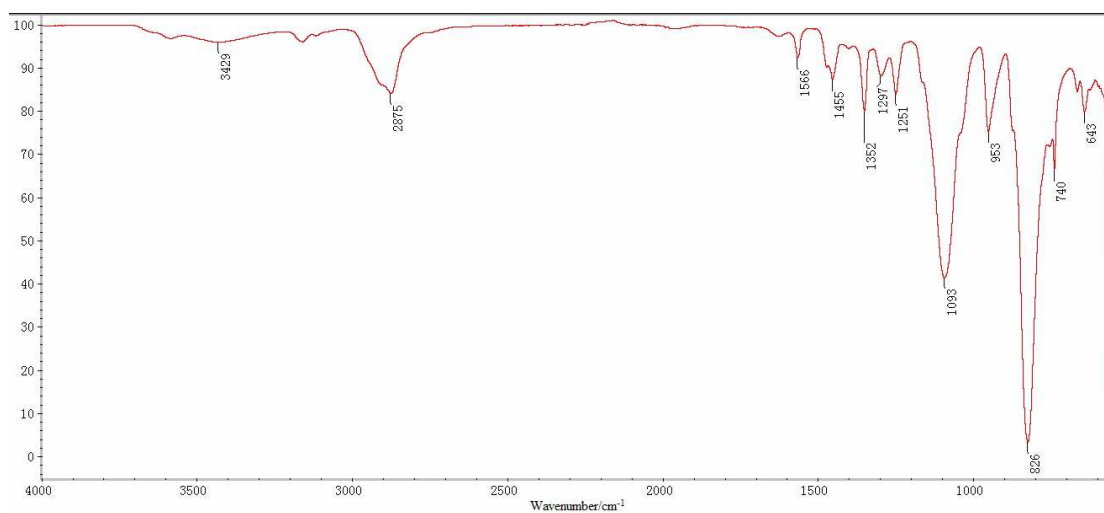


**$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of [diol-PEG-DIL][PF<sub>6</sub>] in *d*-DMSO:**

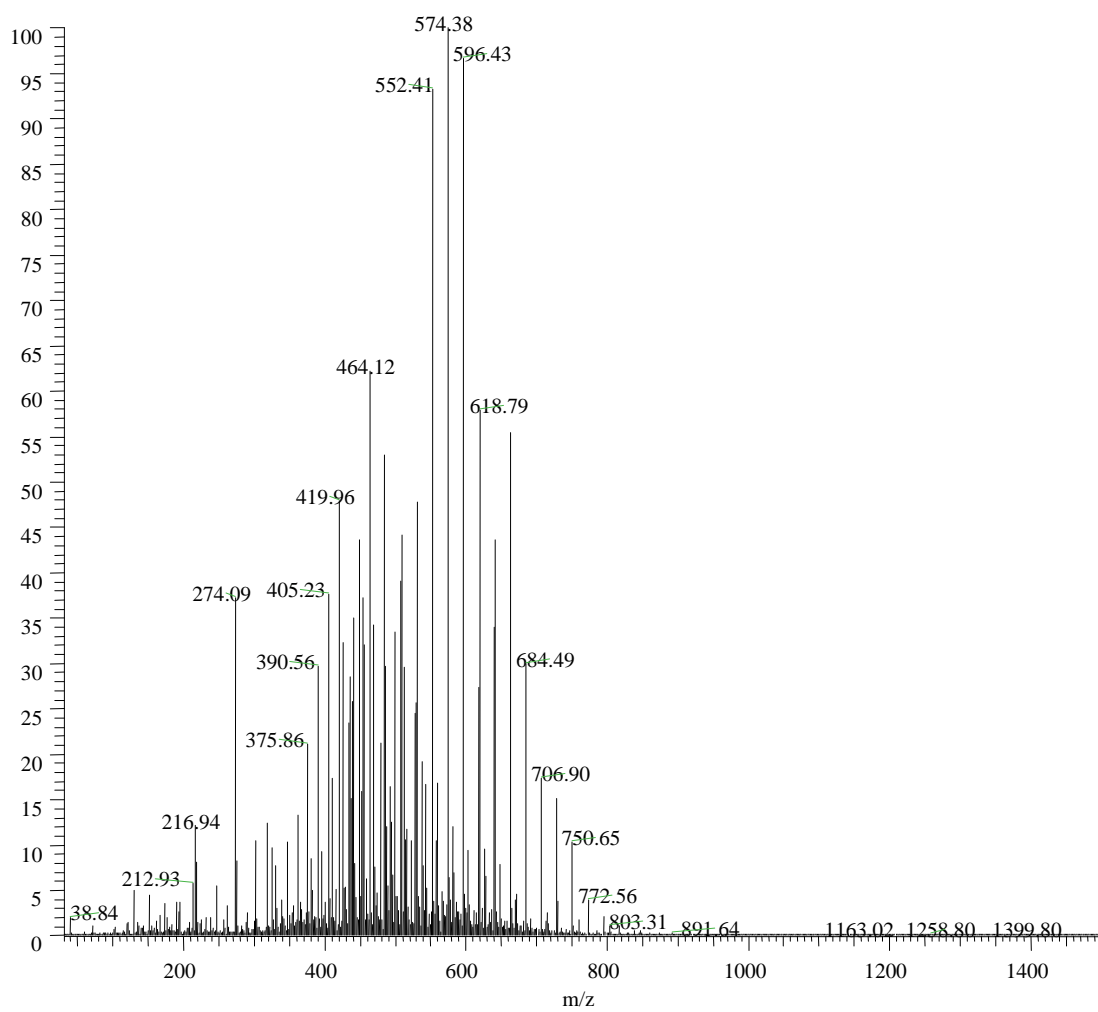




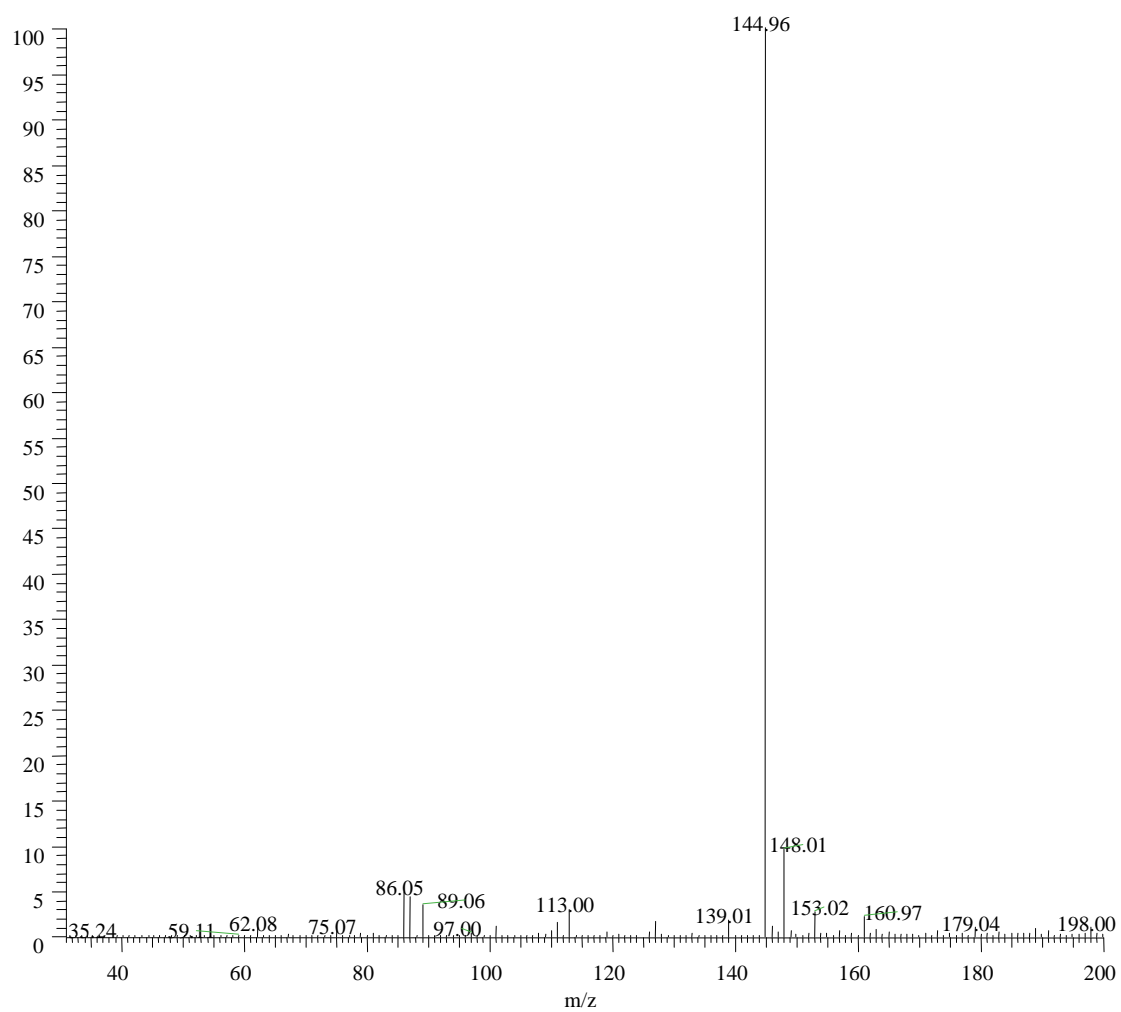
The FT-IR spectrum of [diol-PEG-DIL][PF6]:



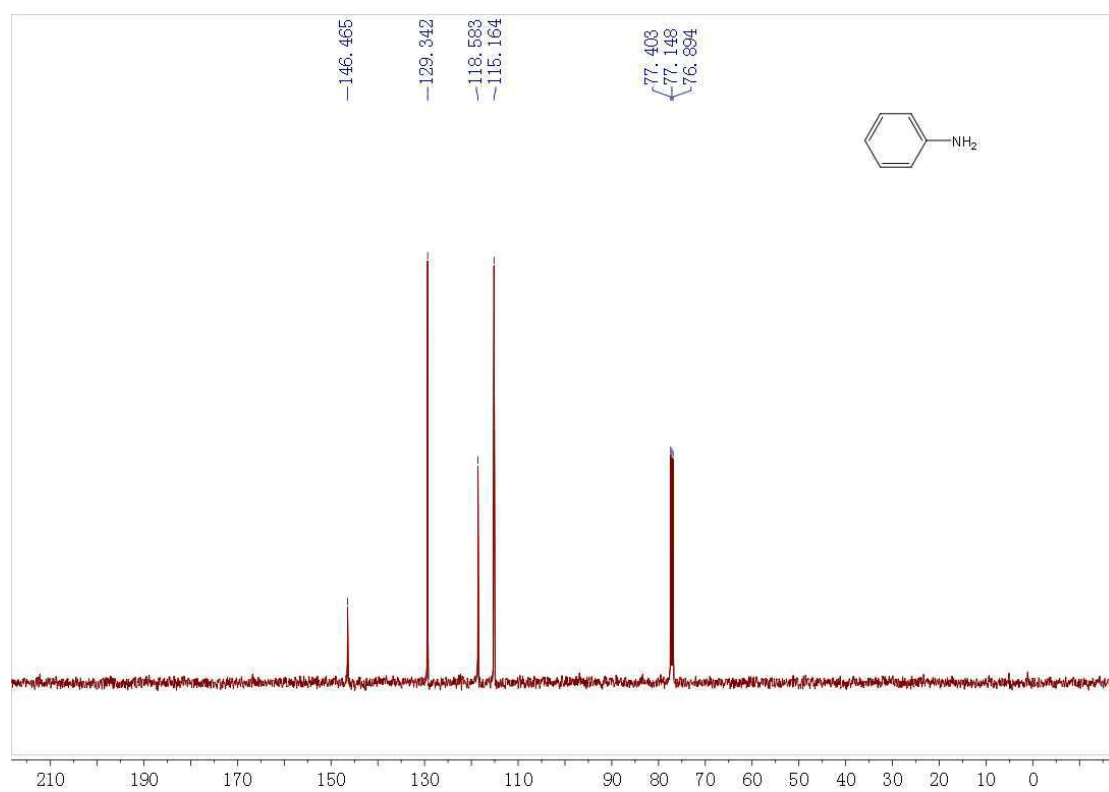
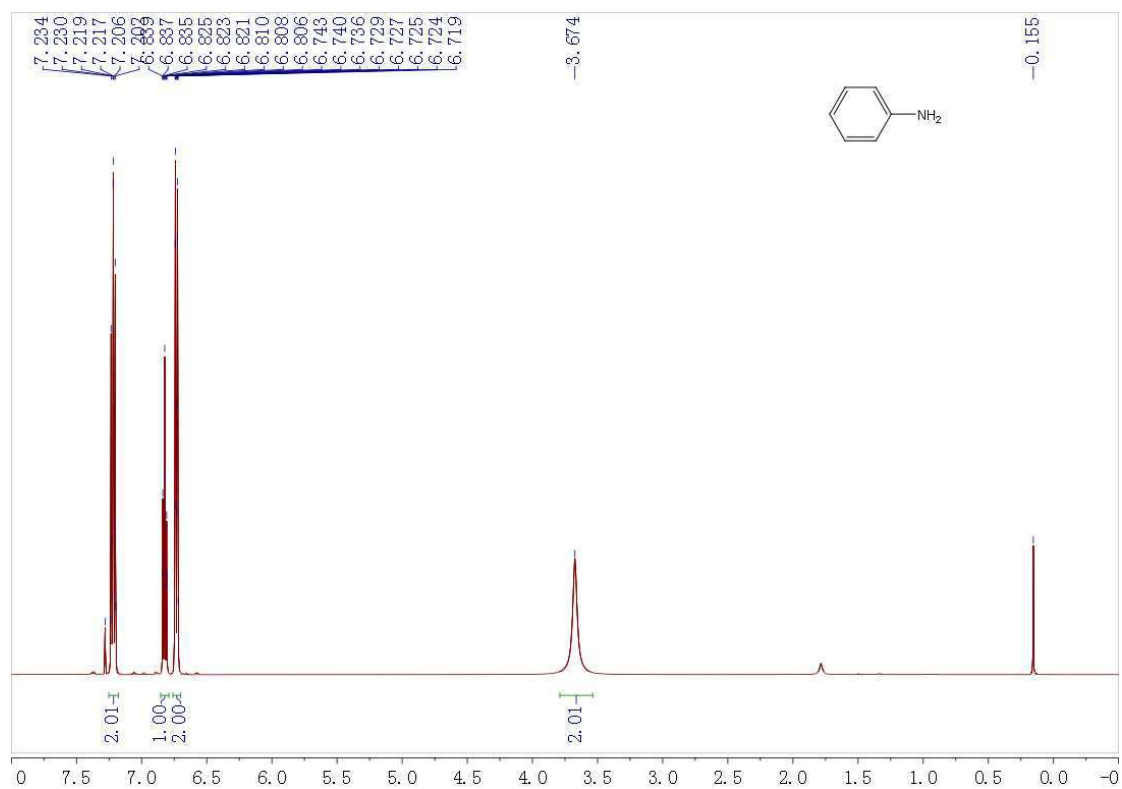
ESI-MS for the cation of [diol-PEG-DIL][PF<sub>6</sub>]:



ESI-MS for the anion of [diol-PEG-DIL][PF<sub>6</sub>]:

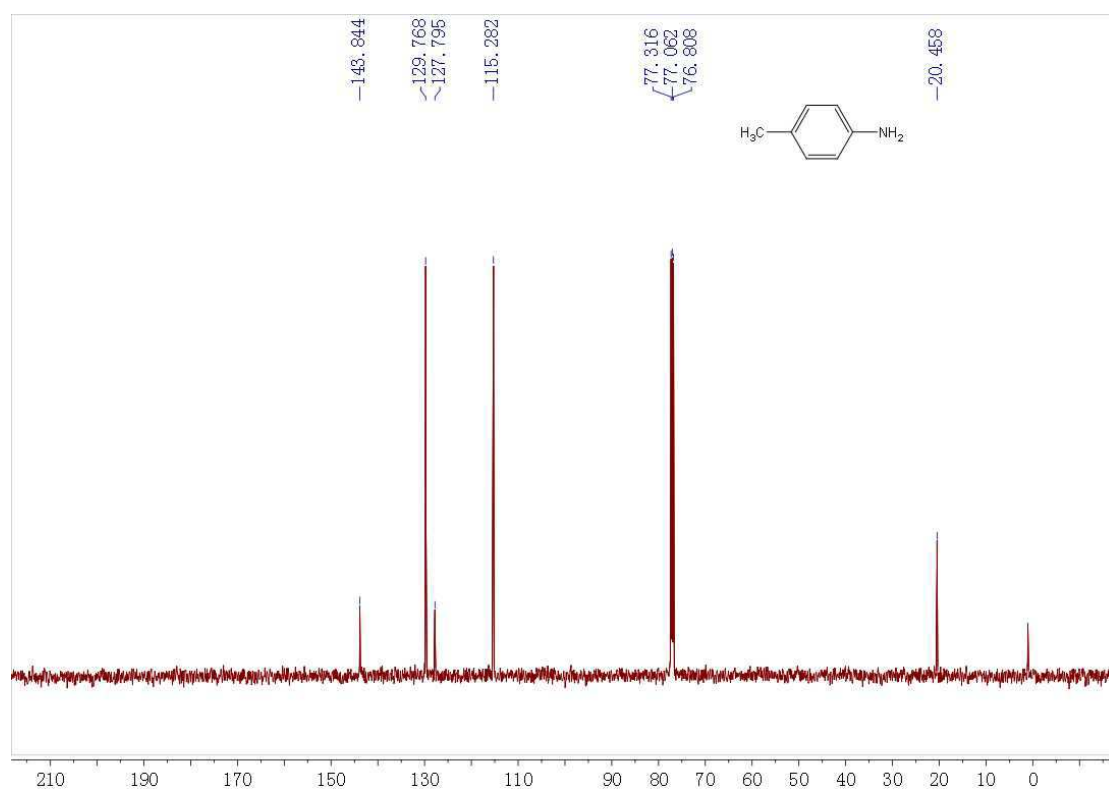
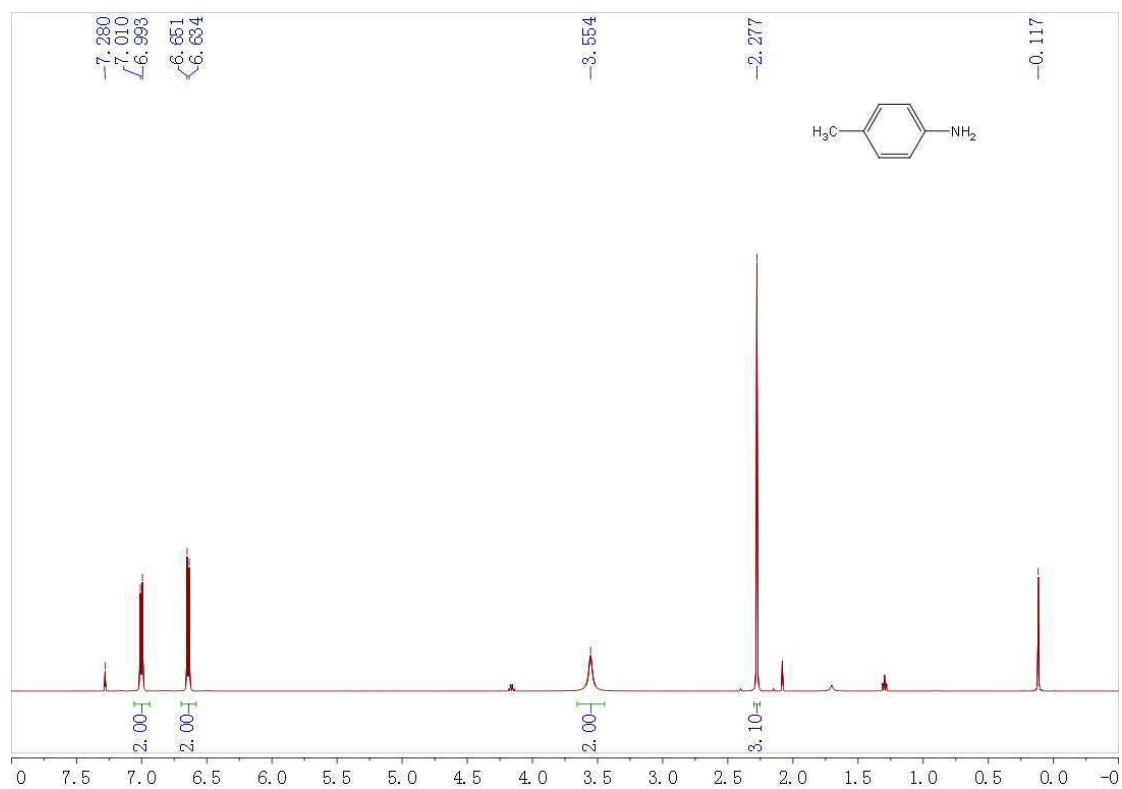


$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of aniline in  $\text{CDCl}_3$ :

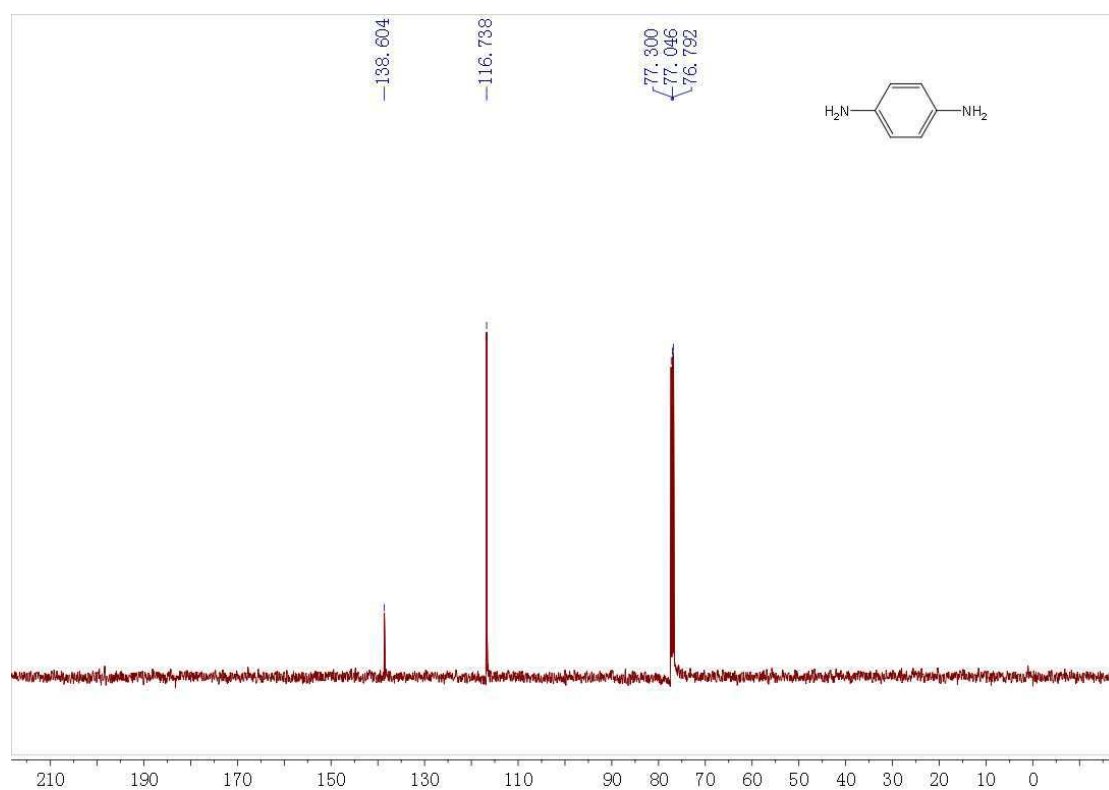
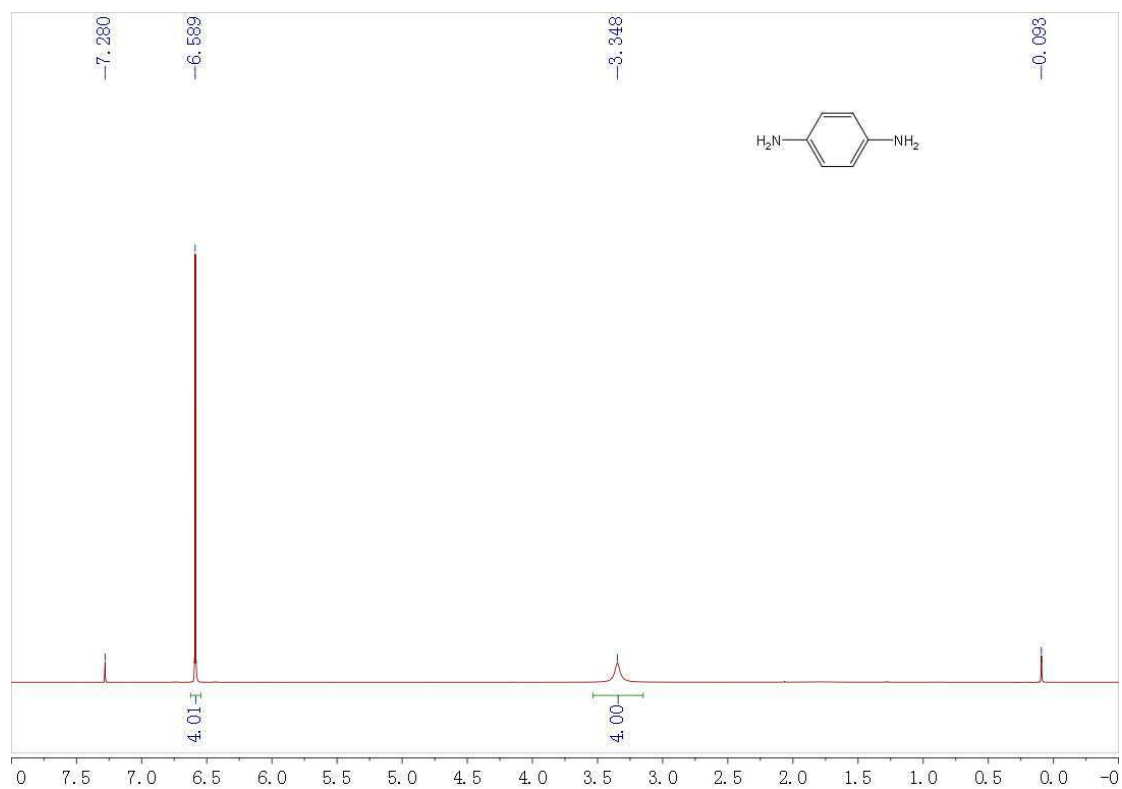


<sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra of *p*-Toluidine in CDCl<sub>3</sub>:

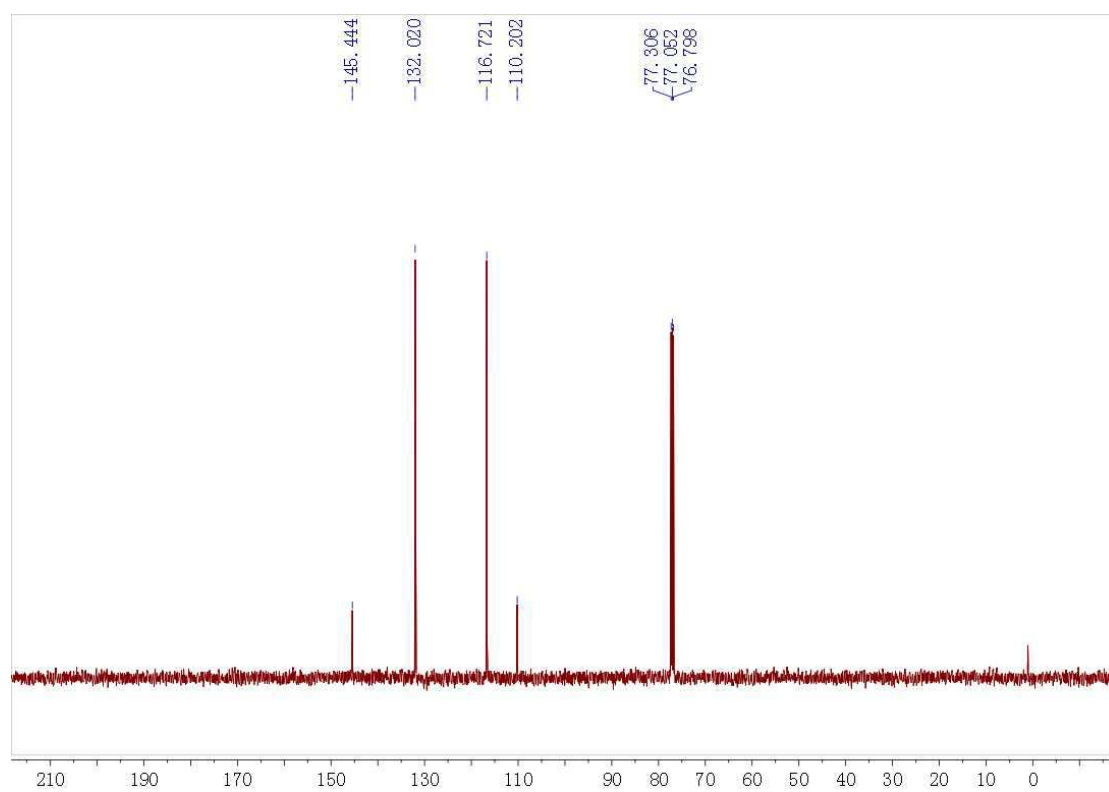
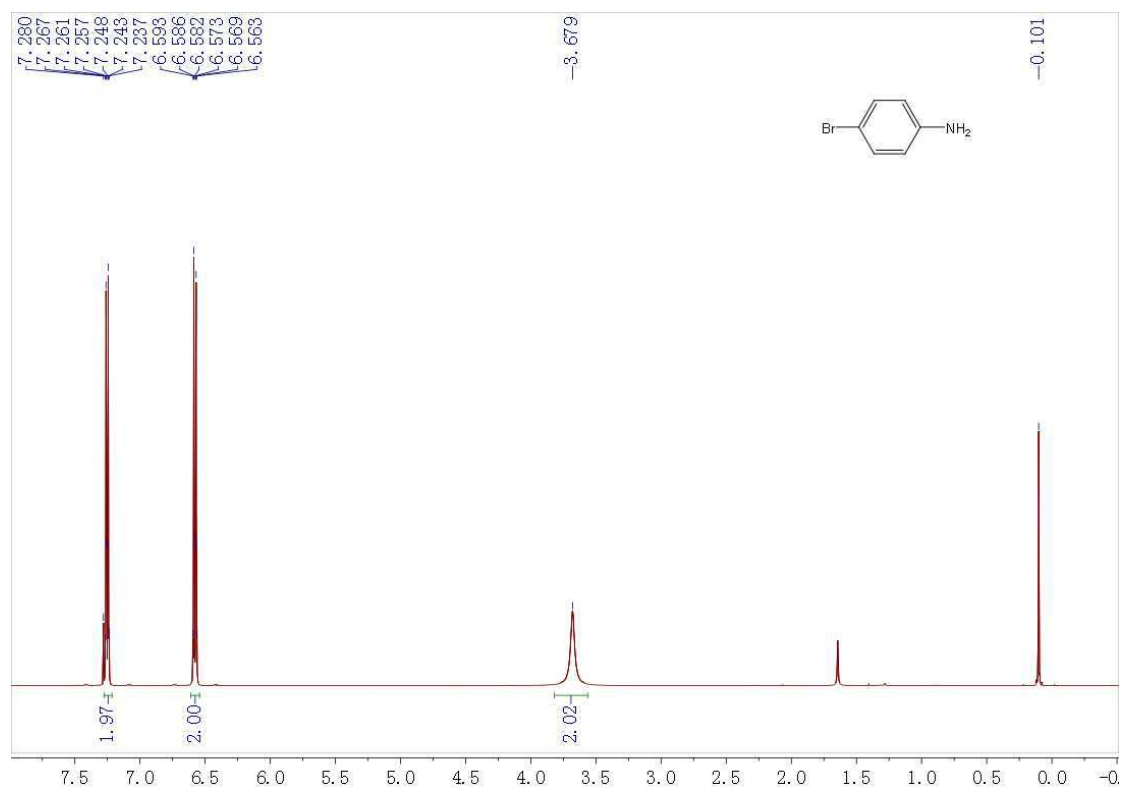




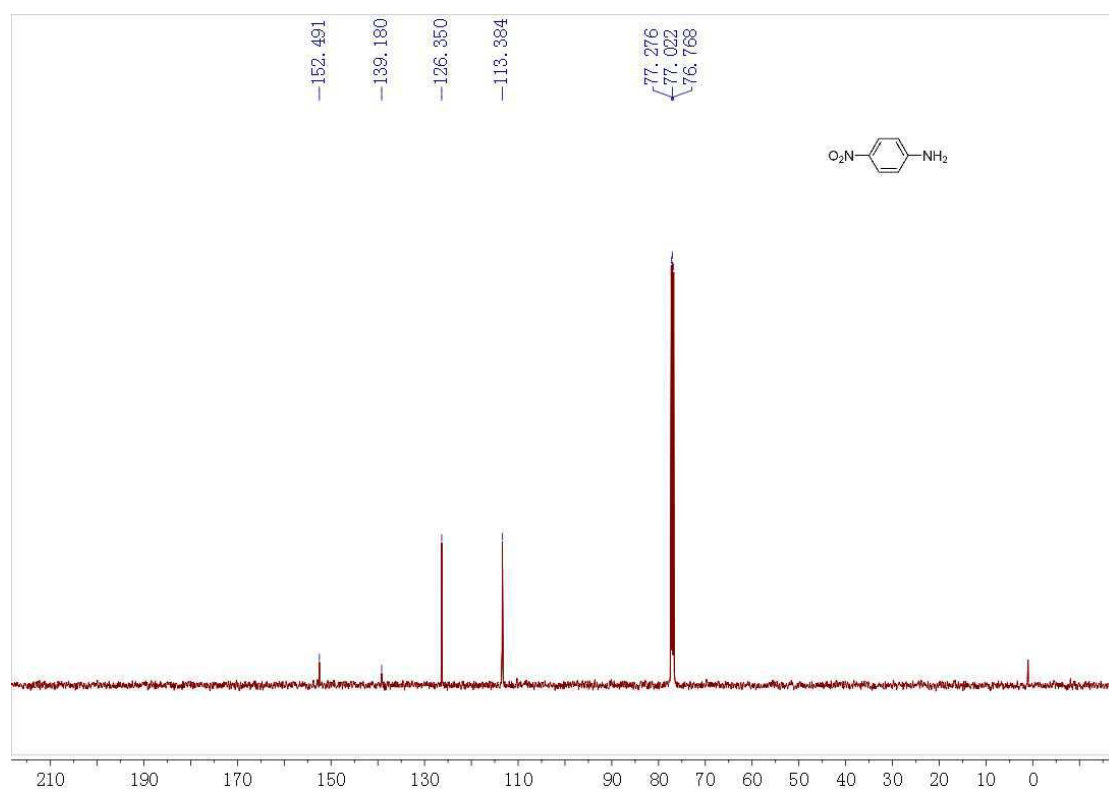
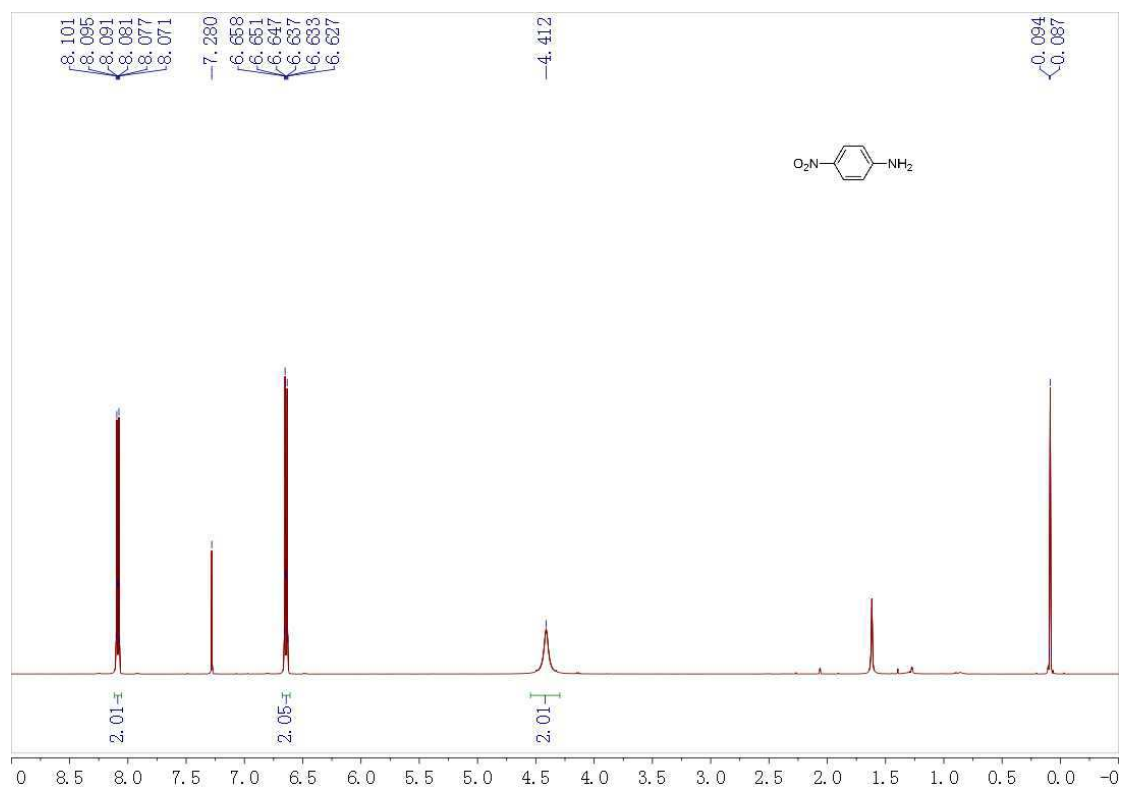
<sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra of *p*-Phenylene diamine in CDCl<sub>3</sub>:



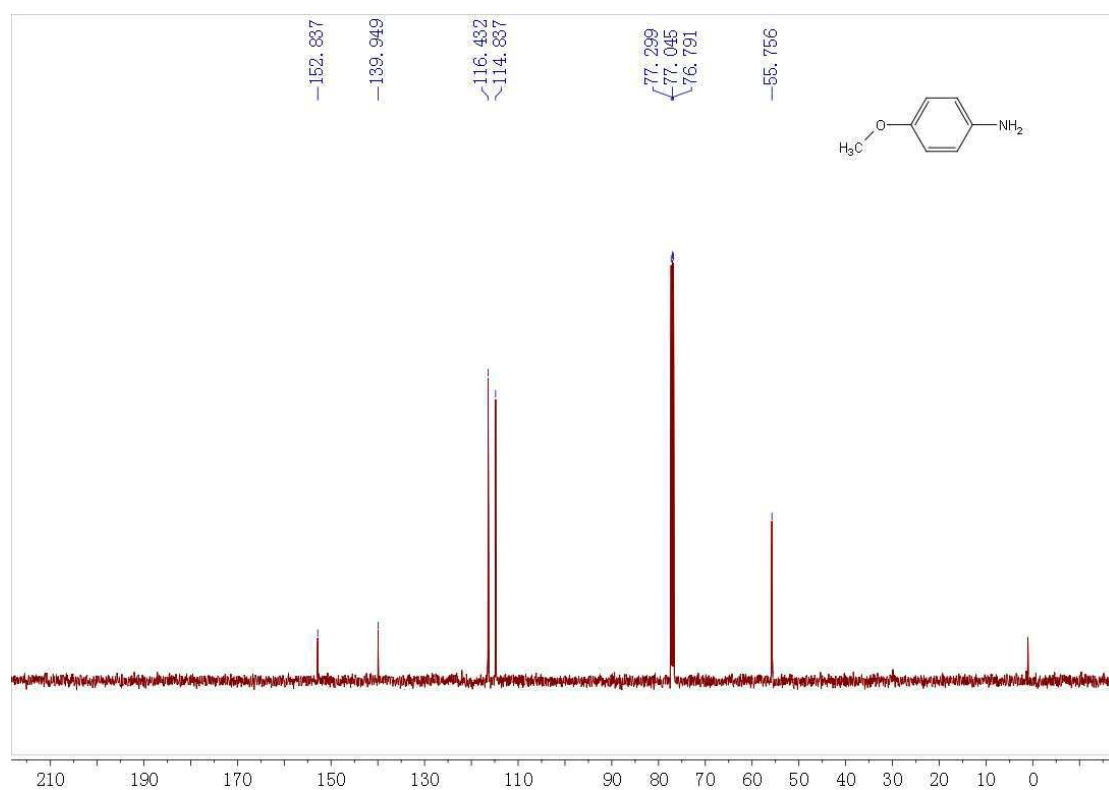
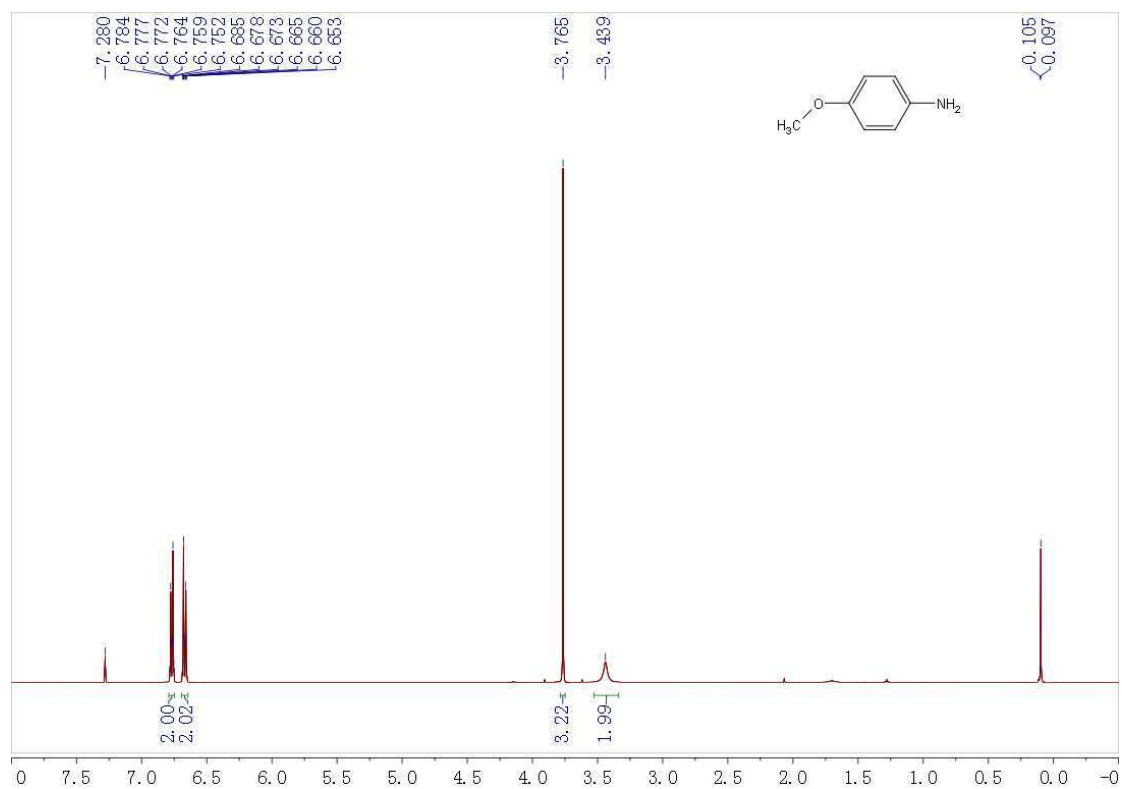
$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of 4-Bromoaniline in  $\text{CDCl}_3$ :



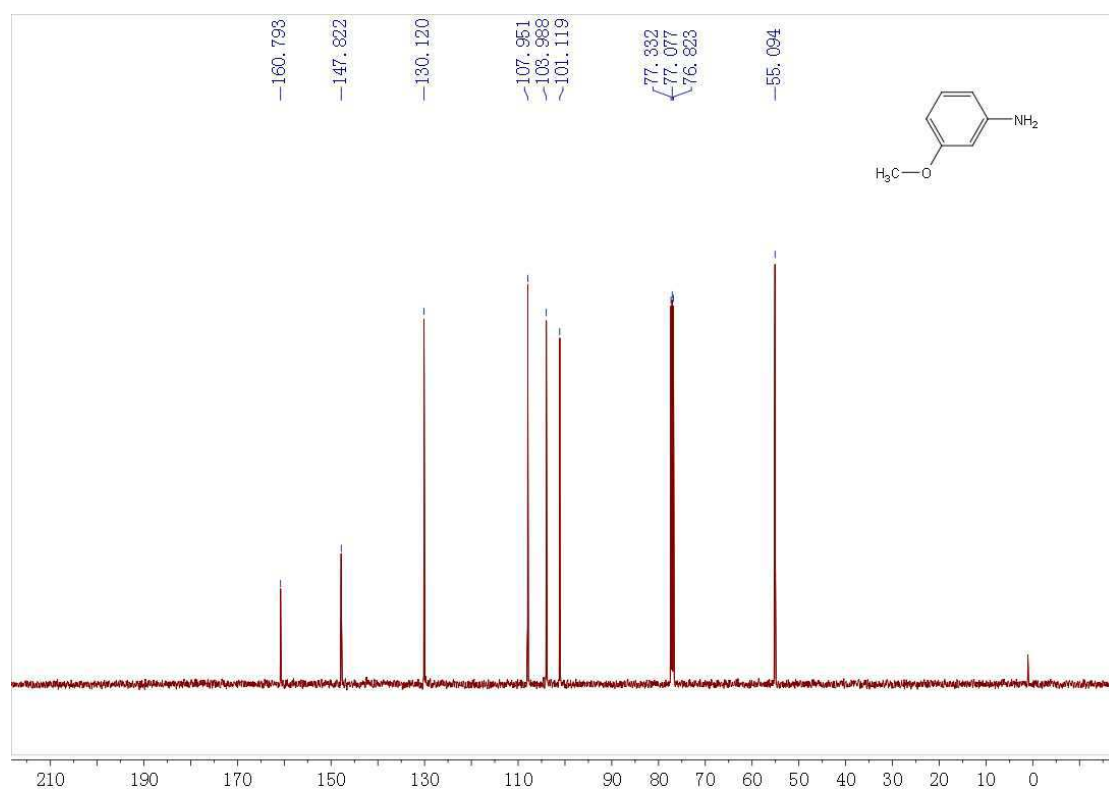
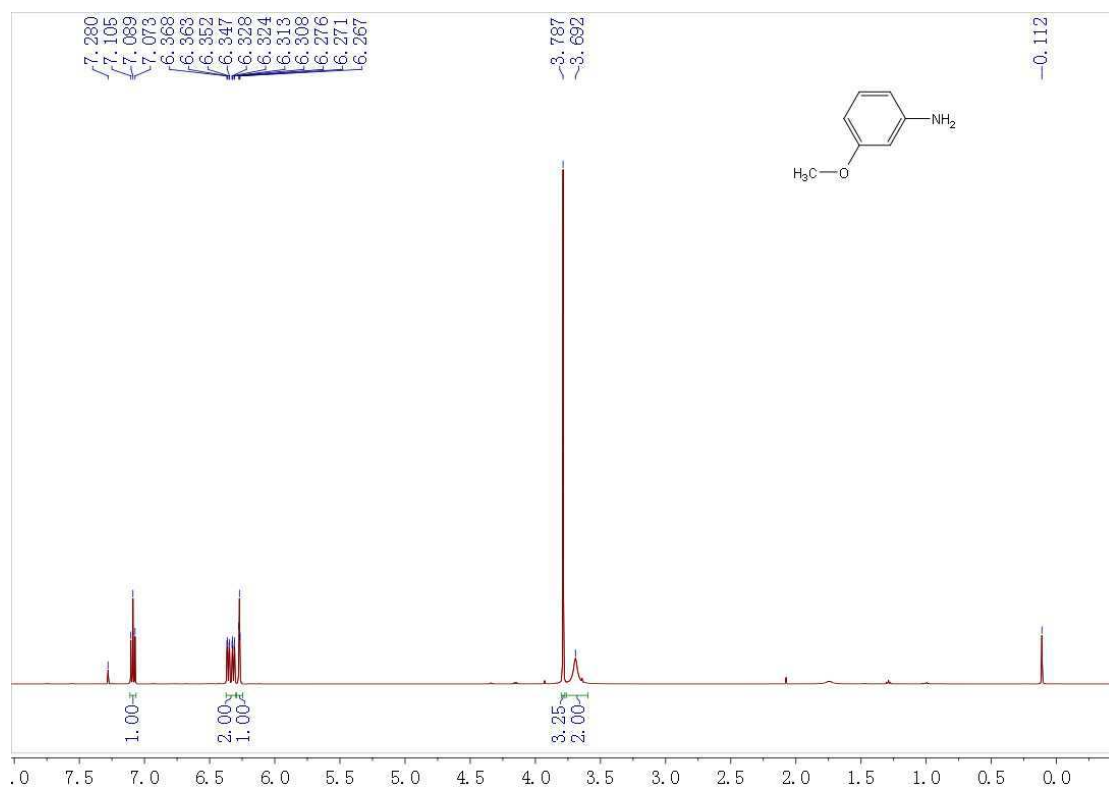
$^1\text{H}$ -NMR and  $^{13}\text{C}$ -NMR spectra of 4-Nitroaniline in  $\text{CDCl}_3$ :



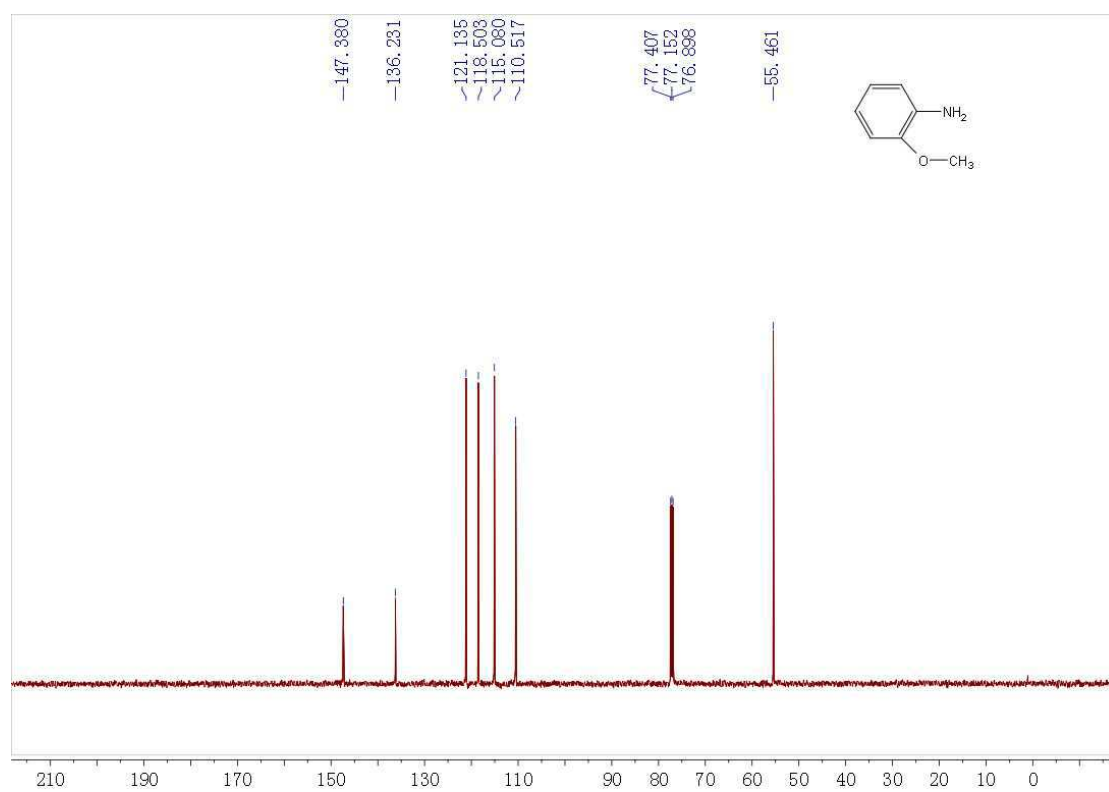
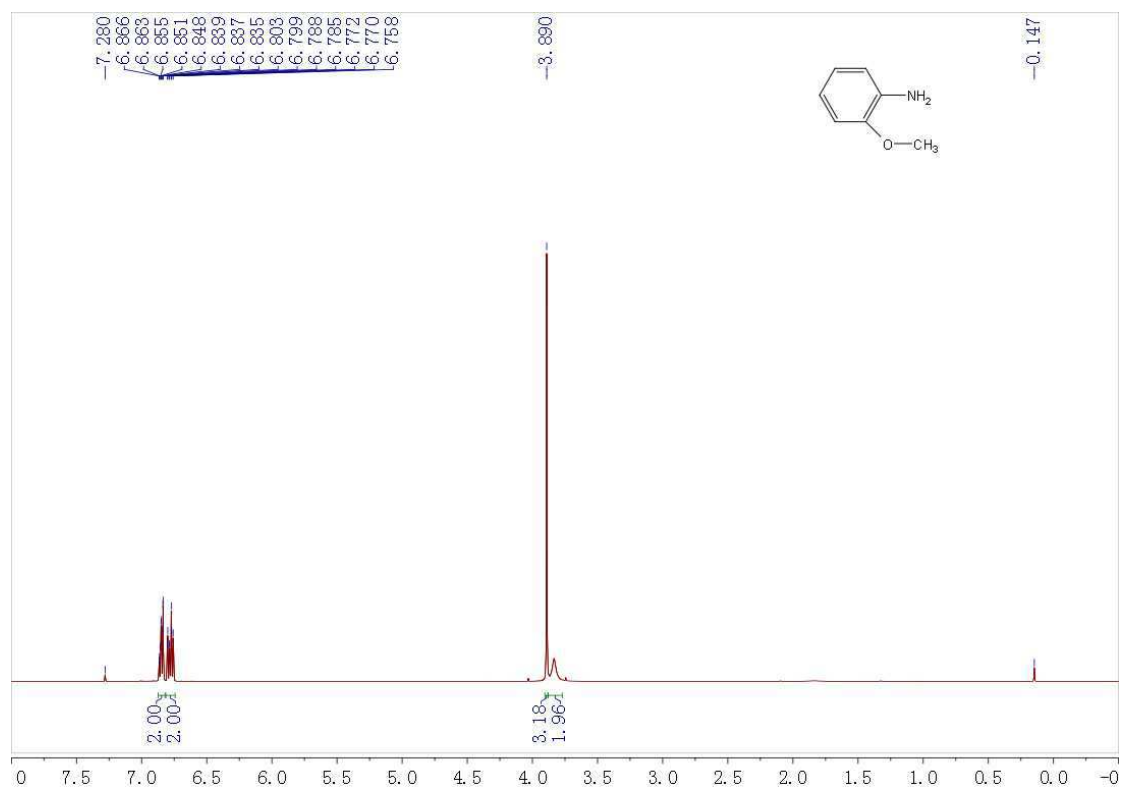
$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of 4-Anisidine in  $\text{CDCl}_3$ :



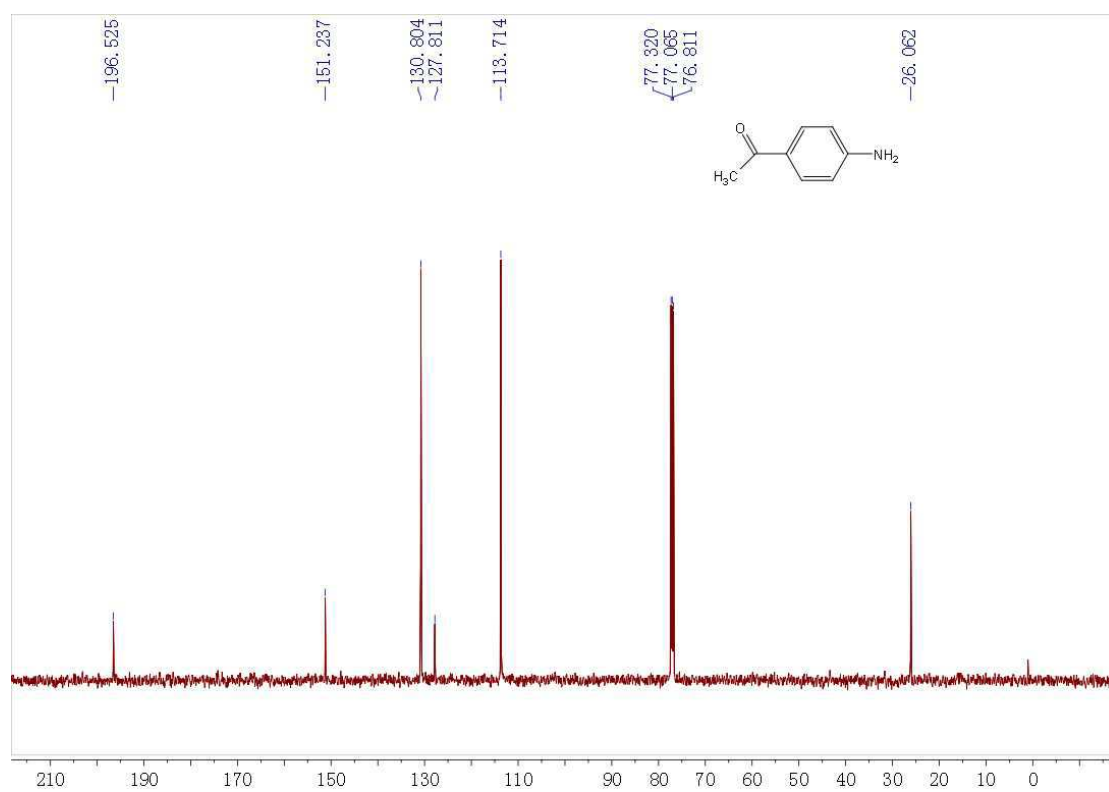
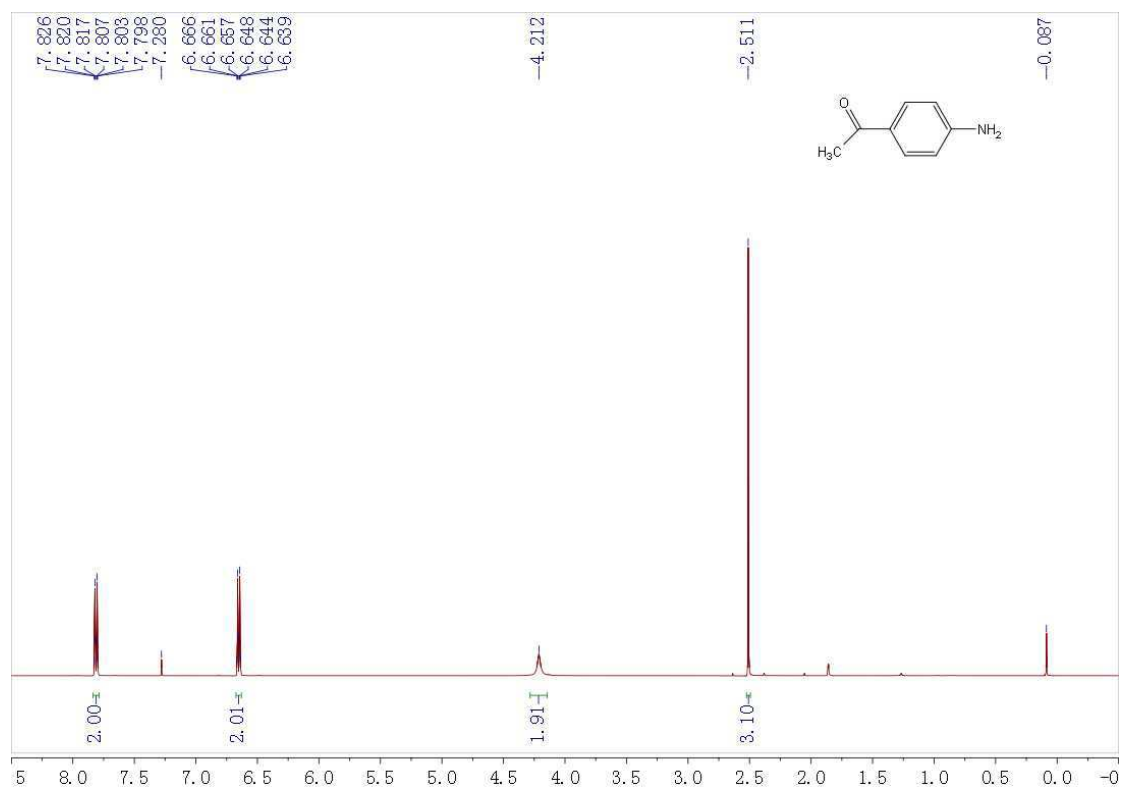
$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of 3-Anisidine in  $\text{CDCl}_3$ :



<sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra of 2-Anisidine in CDCl<sub>3</sub>:

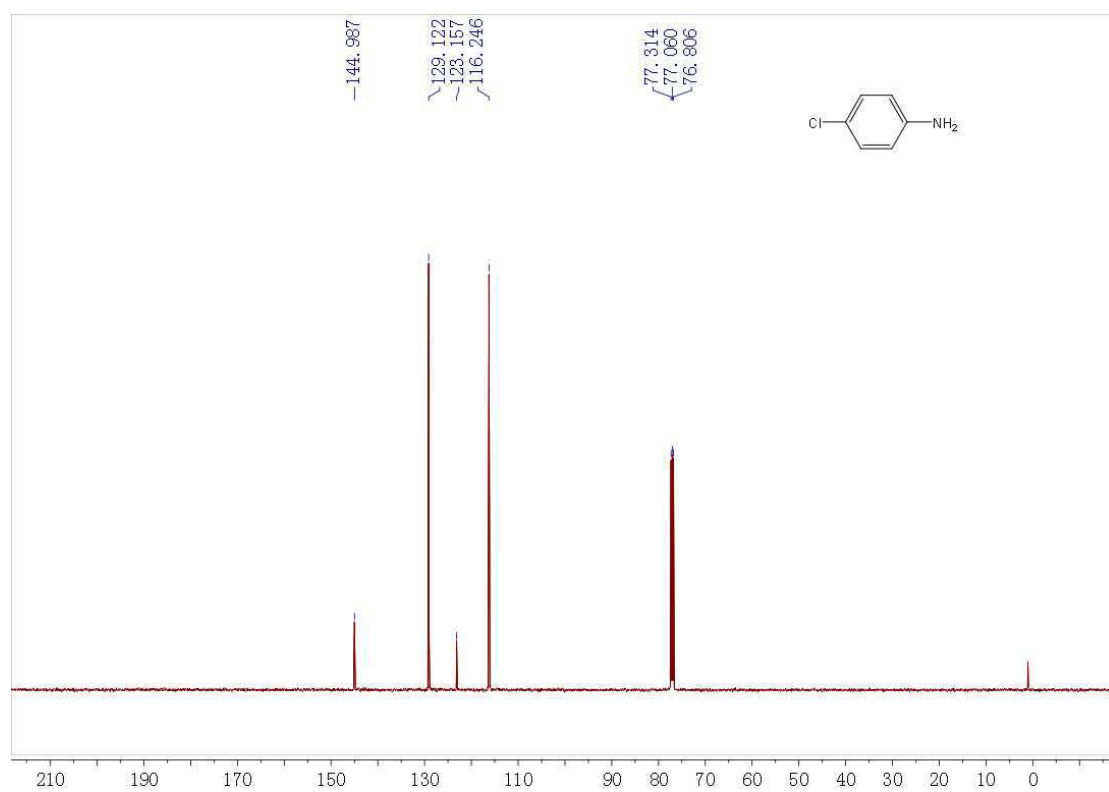
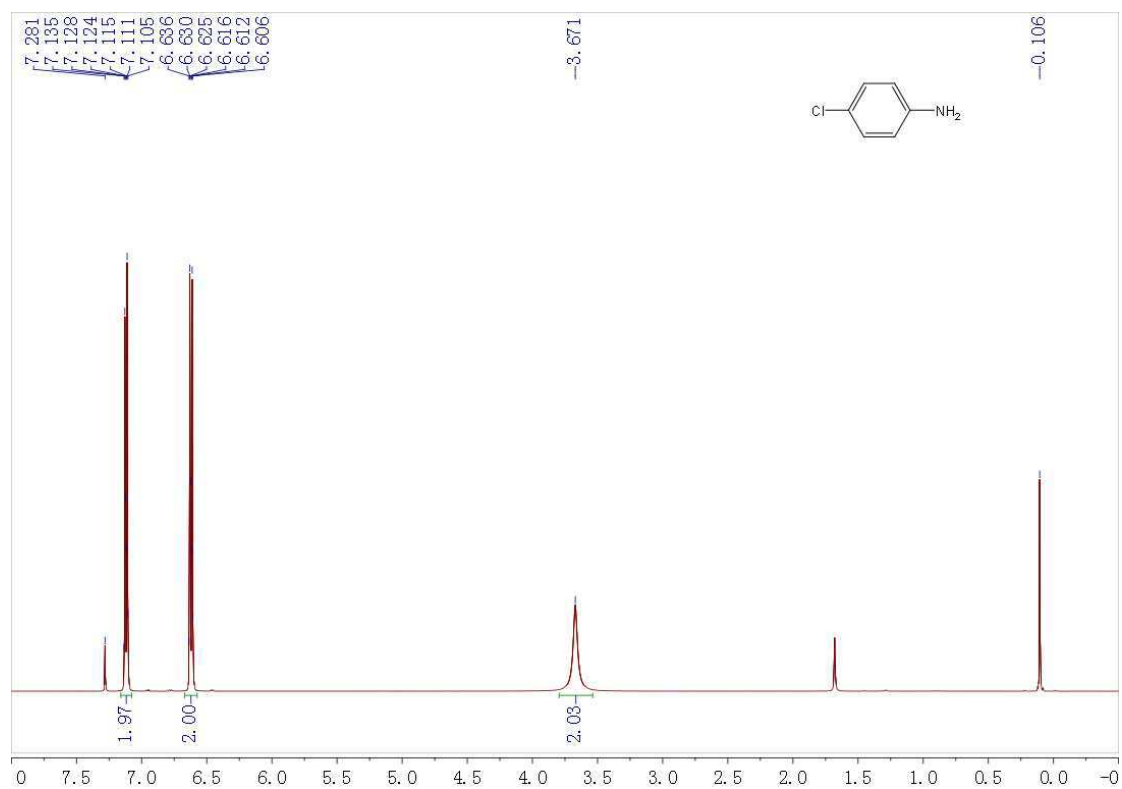


<sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra of 4-Acetylaniline in CDCl<sub>3</sub>:

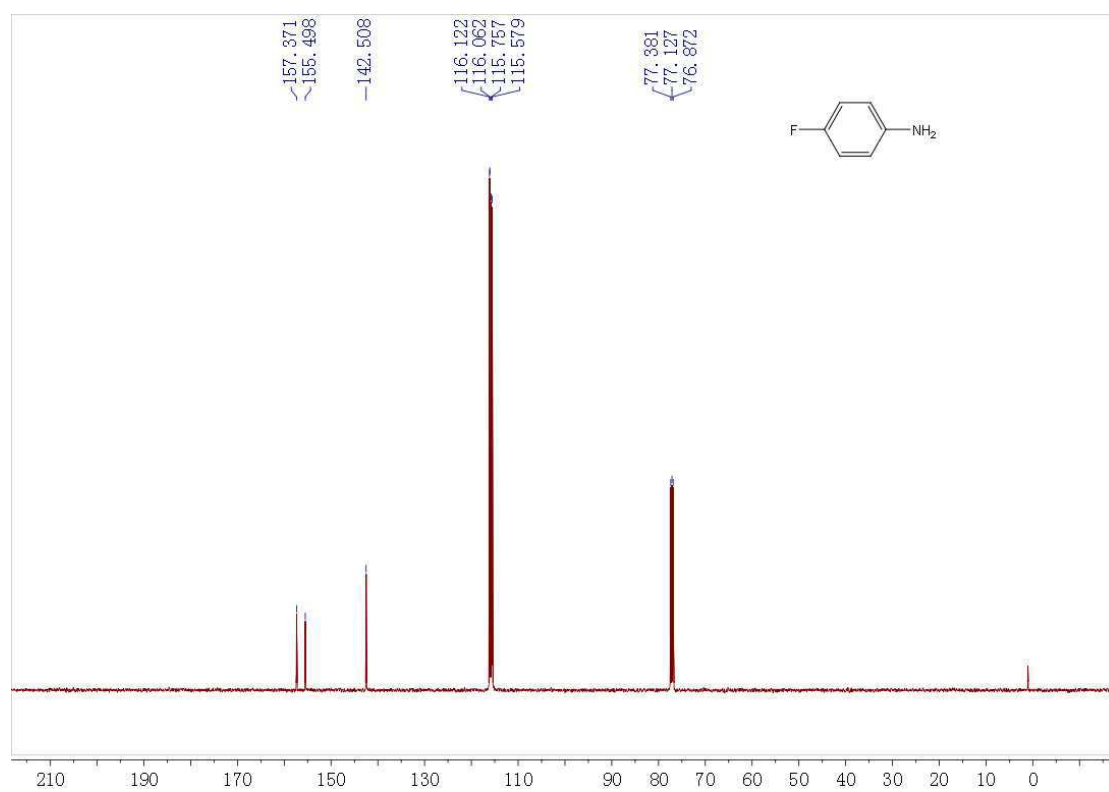
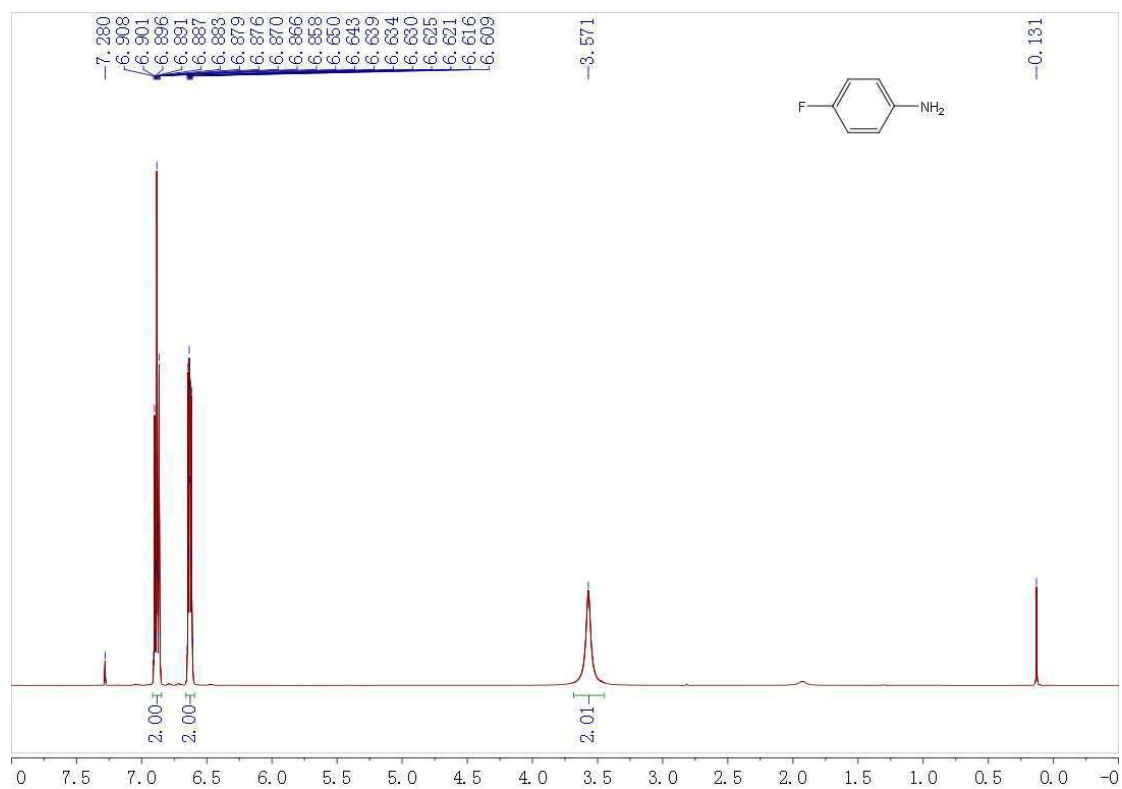


$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of 4-Chloroaniline in  $\text{CDCl}_3$ :

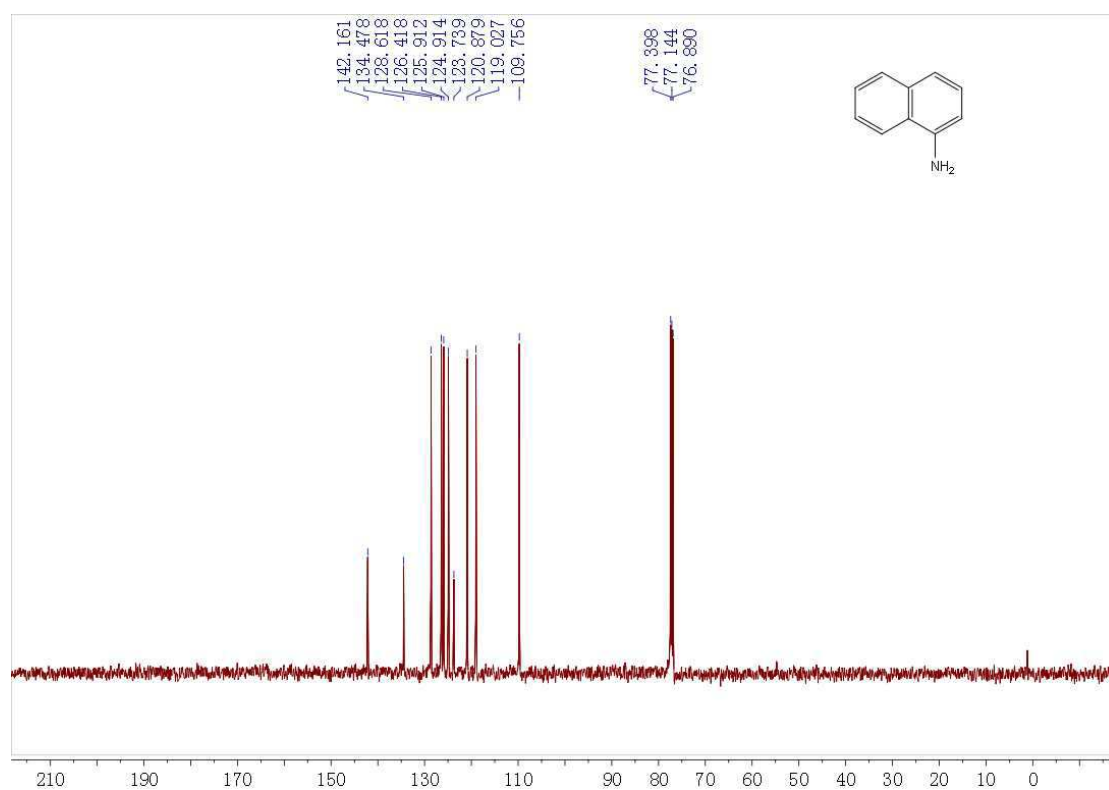
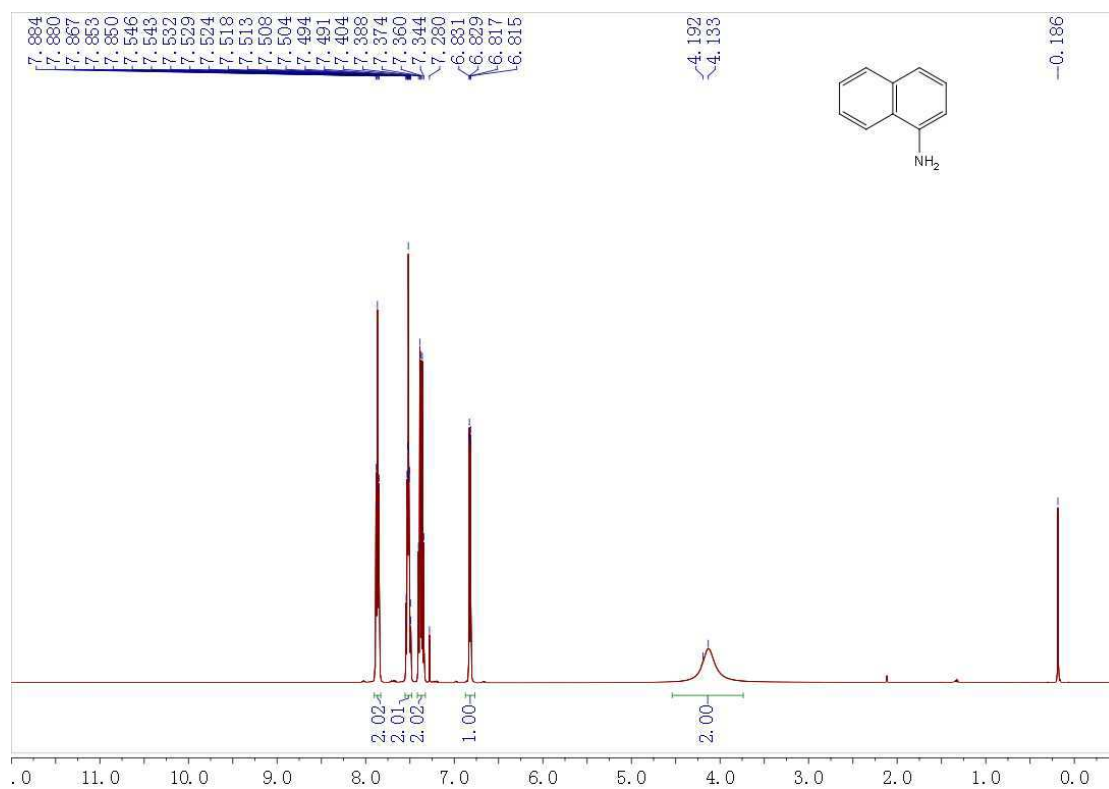




$^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$  spectra of 4-Fluoroaniline in  $\text{CDCl}_3$ :



<sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra of 1-Aminonaphthalene in CDCl<sub>3</sub>:



<sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra of 2-Aminopyridine in CDCl<sub>3</sub>:

