

## Electronic Supplementary Information

# A Novel and Efficient Synthesis of Diverse Dihydronaphtho[1,2-*b*]furans Using the Ceric Ammonium Nitrate-Catalyzed Formal [3+2] Cycloaddition of 1,4-Naphthoquinones to Olefins and Its Application to Furomollugin

Likai Xia and Yong Rok Lee\*

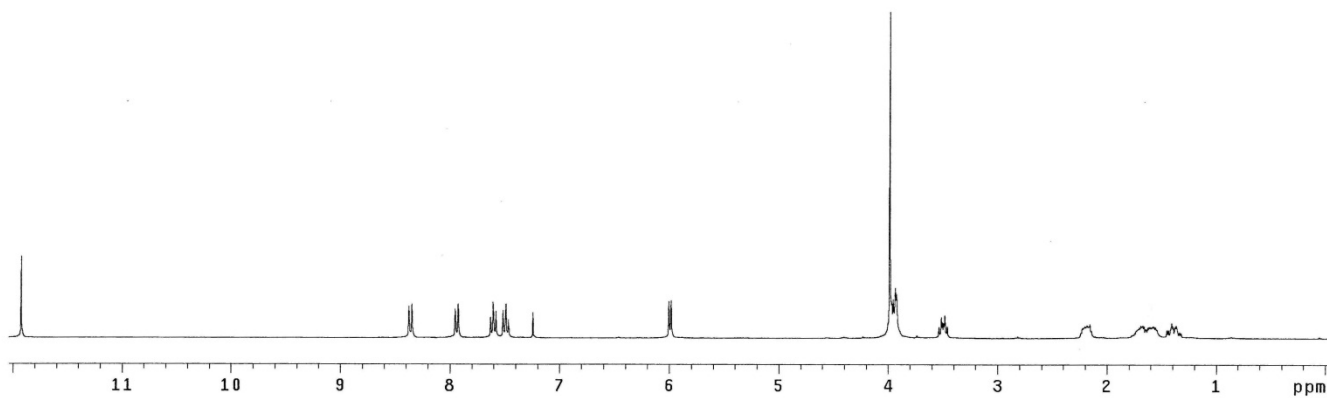
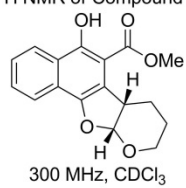
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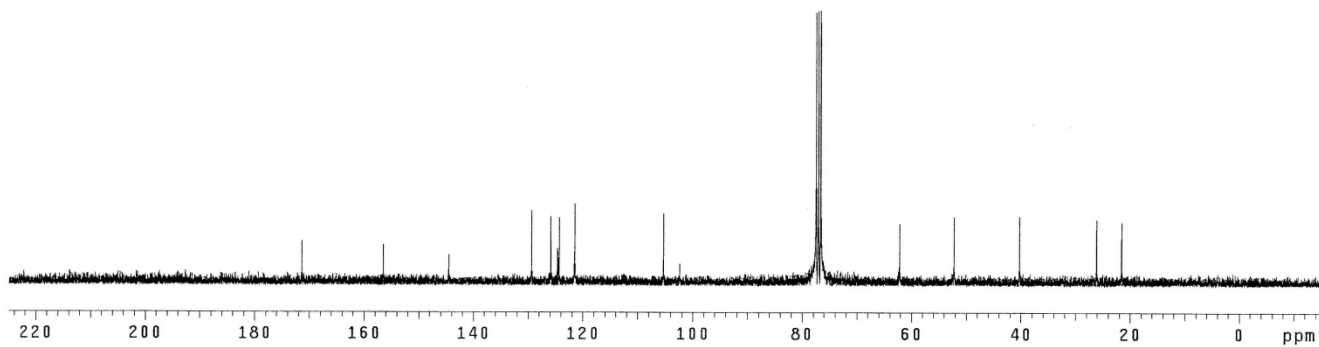
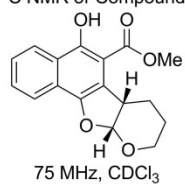
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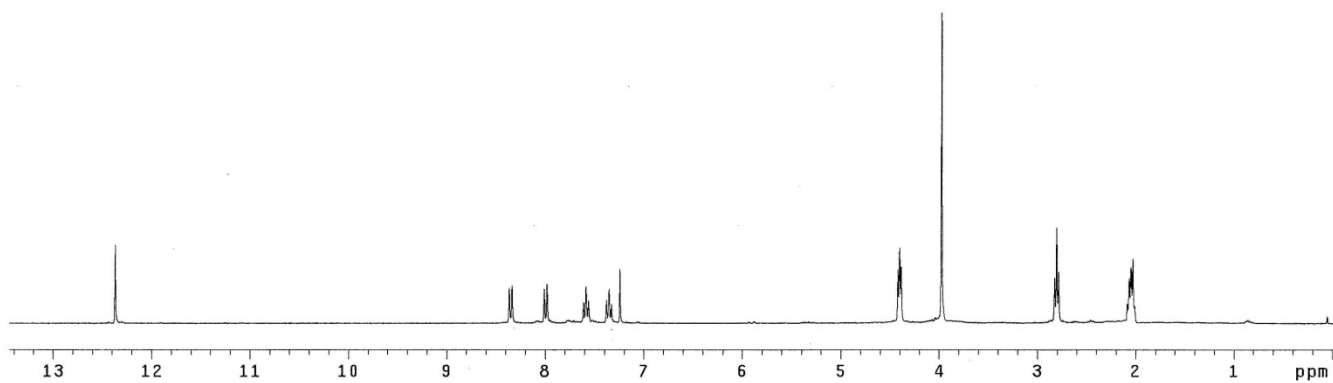
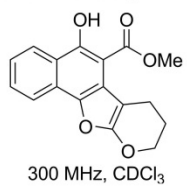
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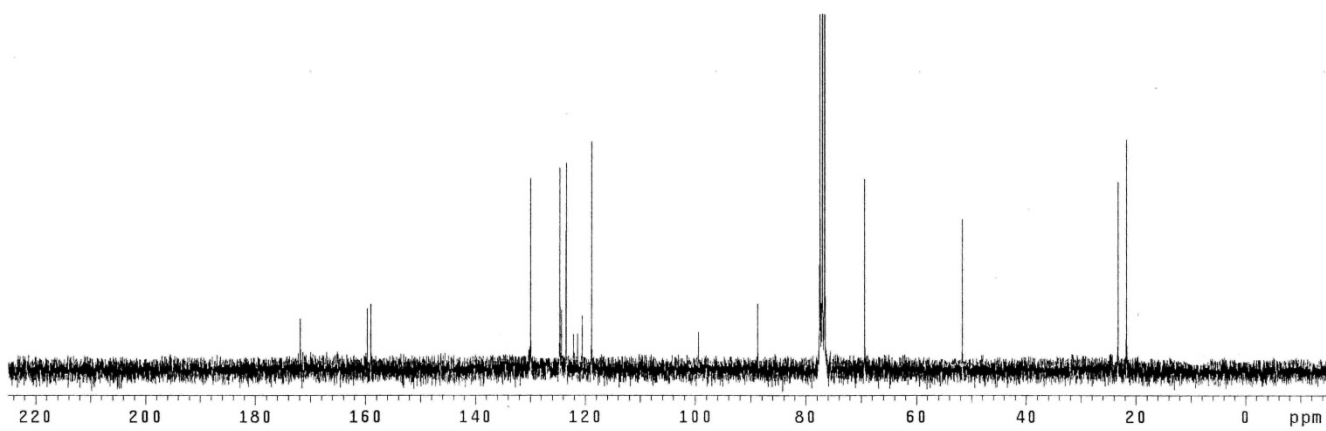
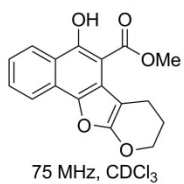
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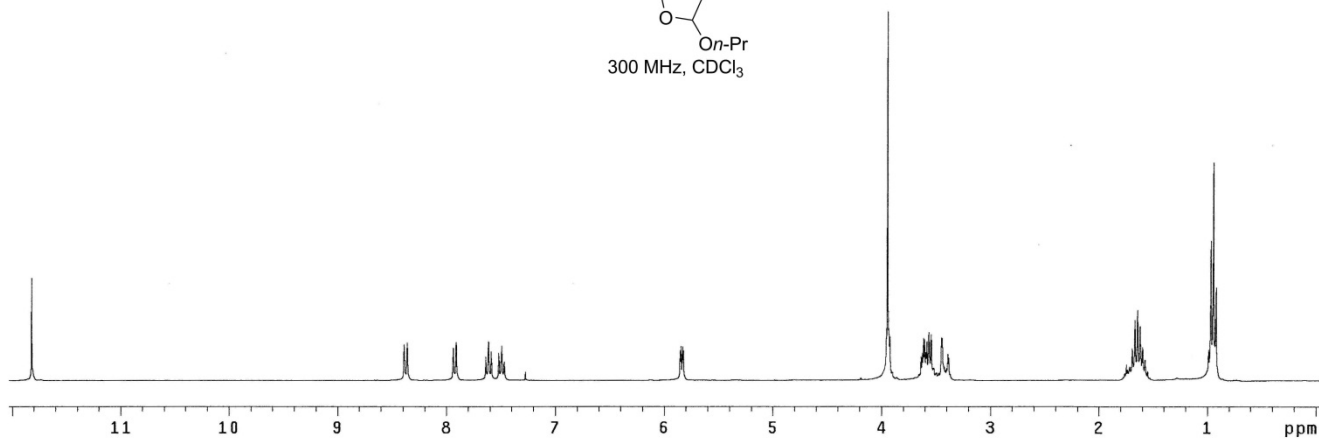
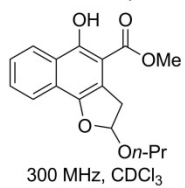
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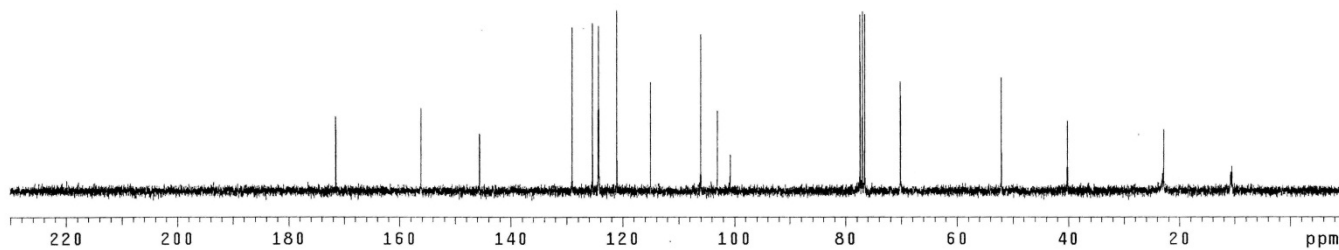
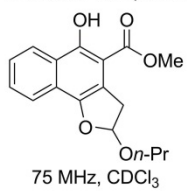
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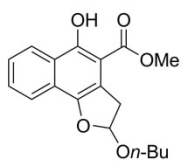
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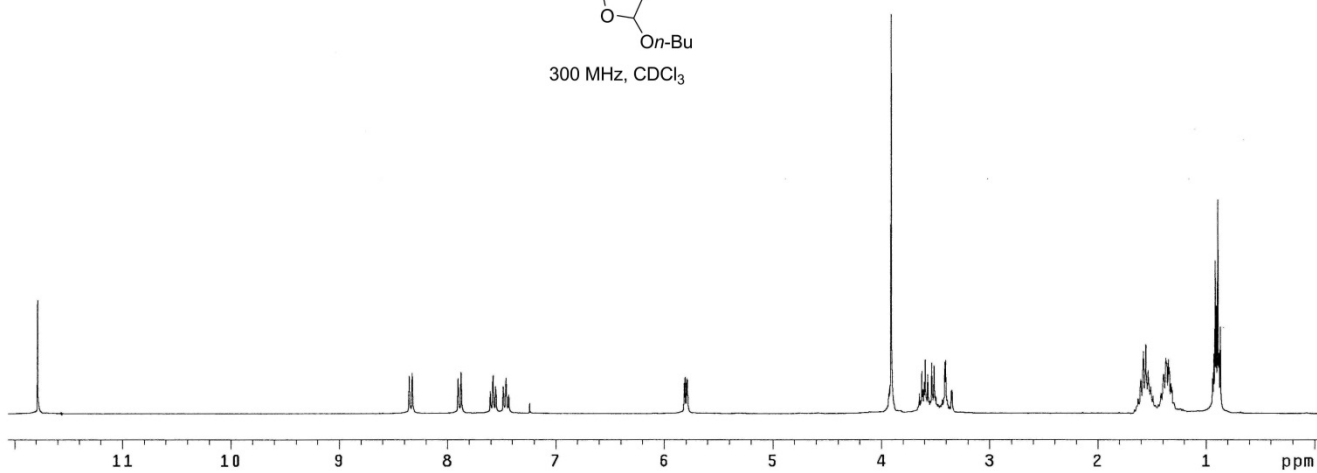
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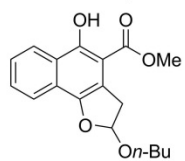
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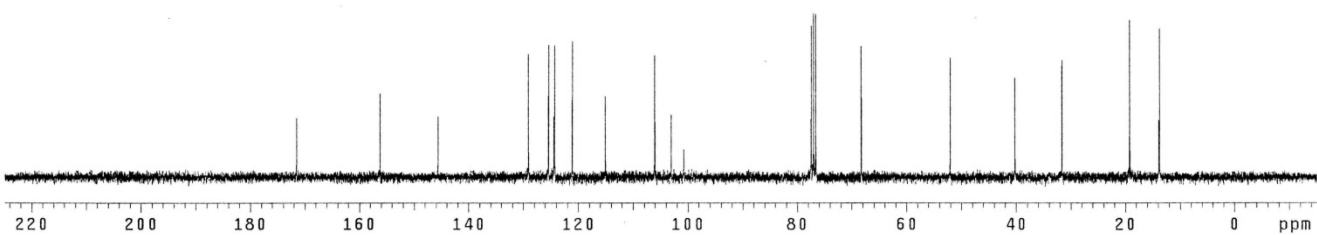
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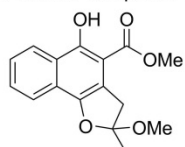
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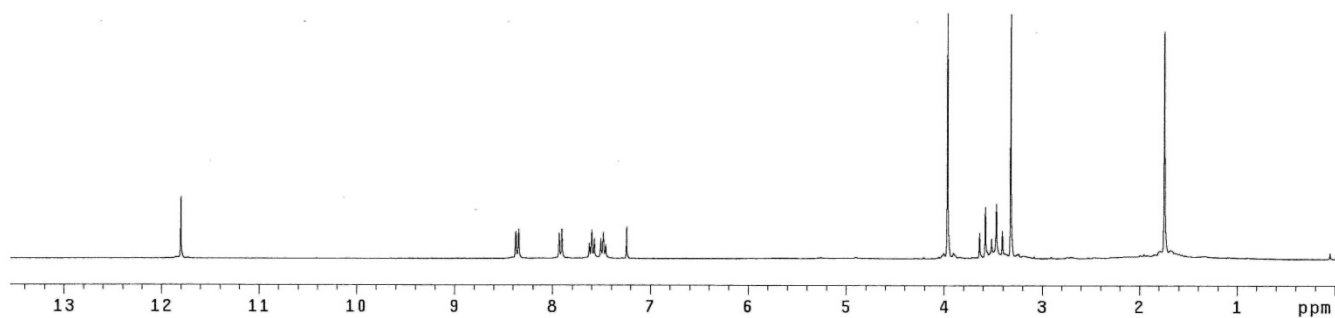
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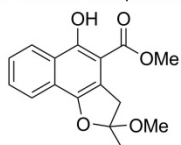
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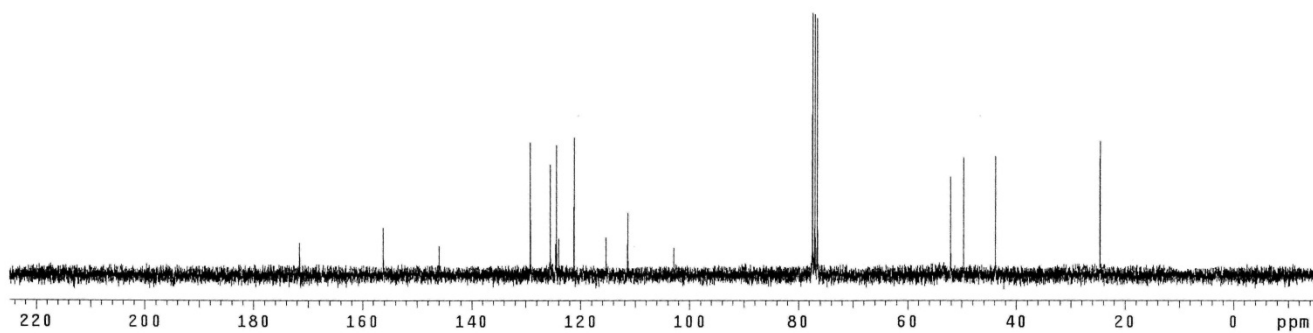
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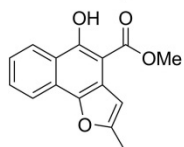
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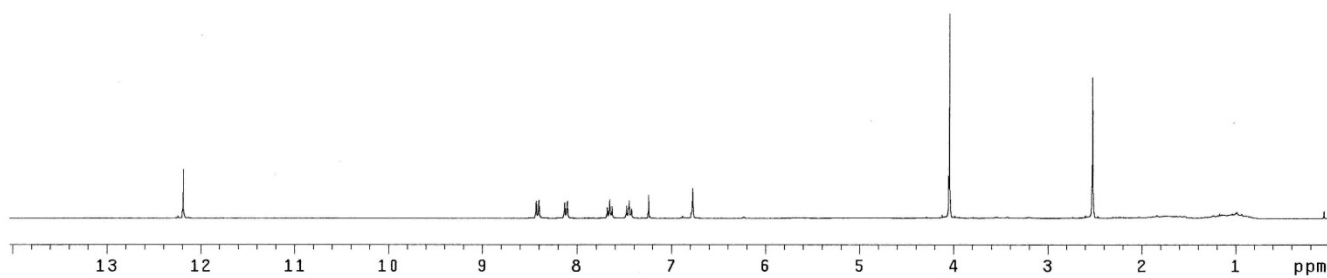
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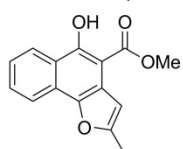
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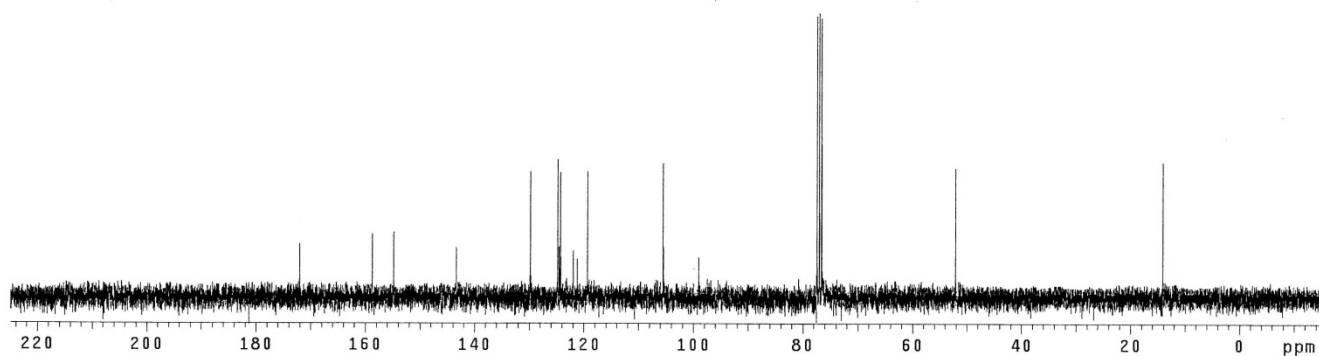
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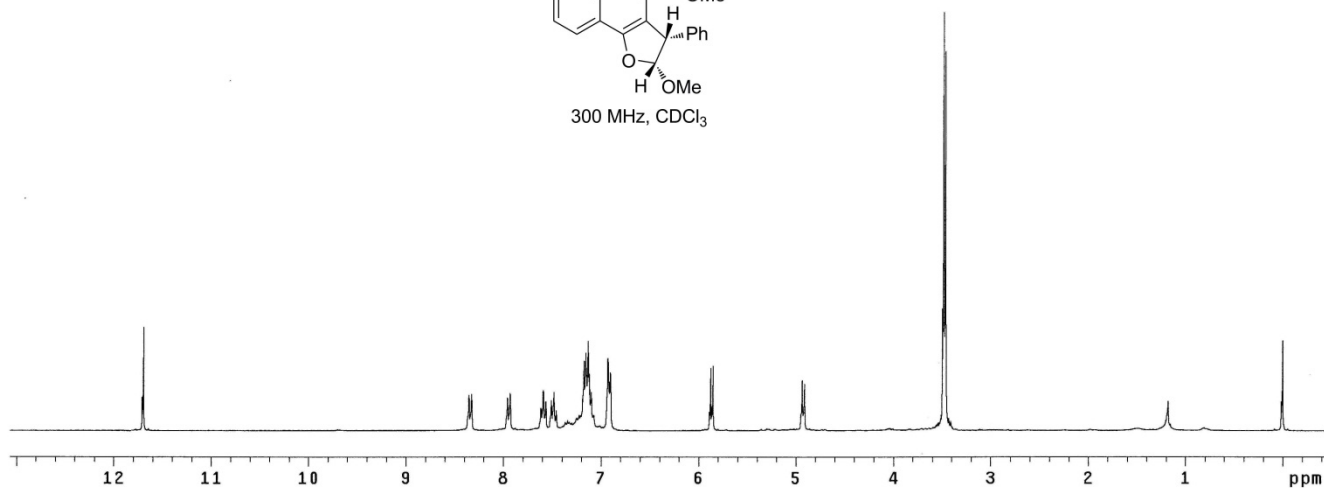
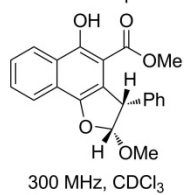


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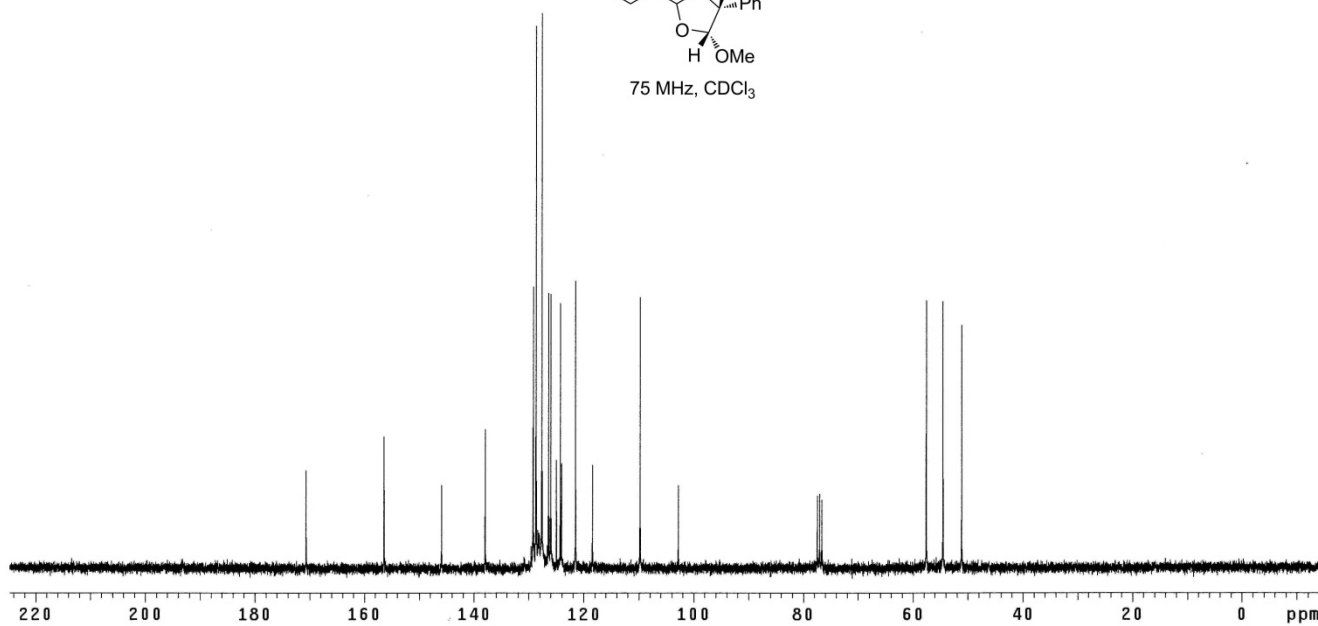
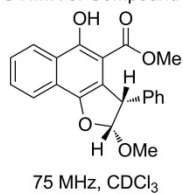




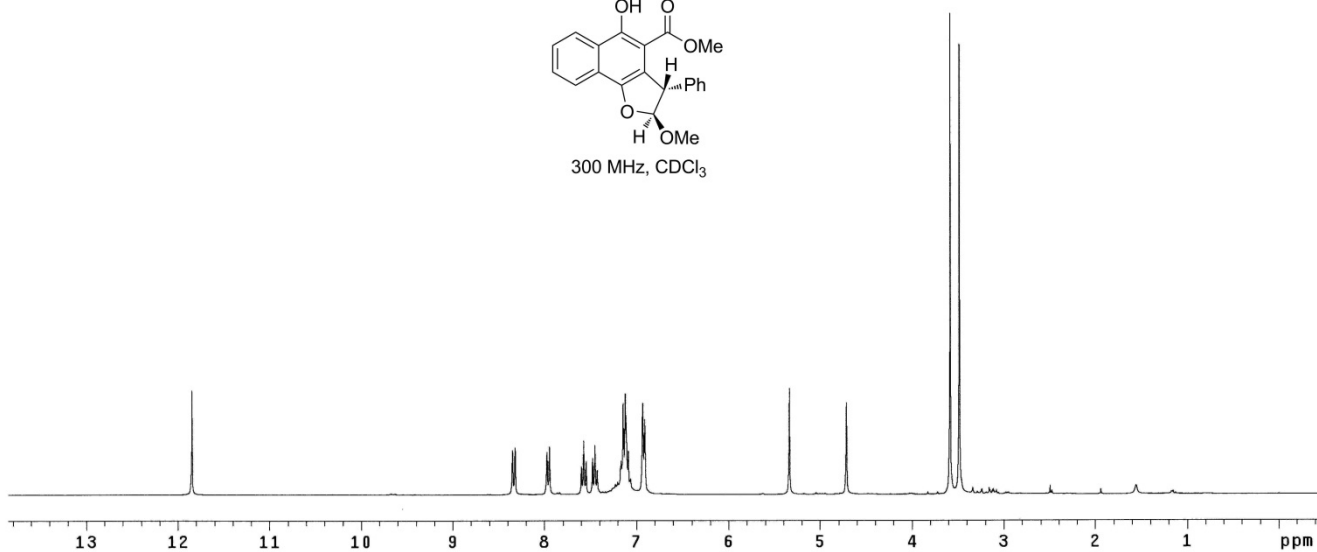
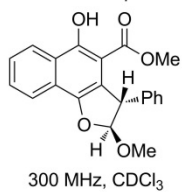
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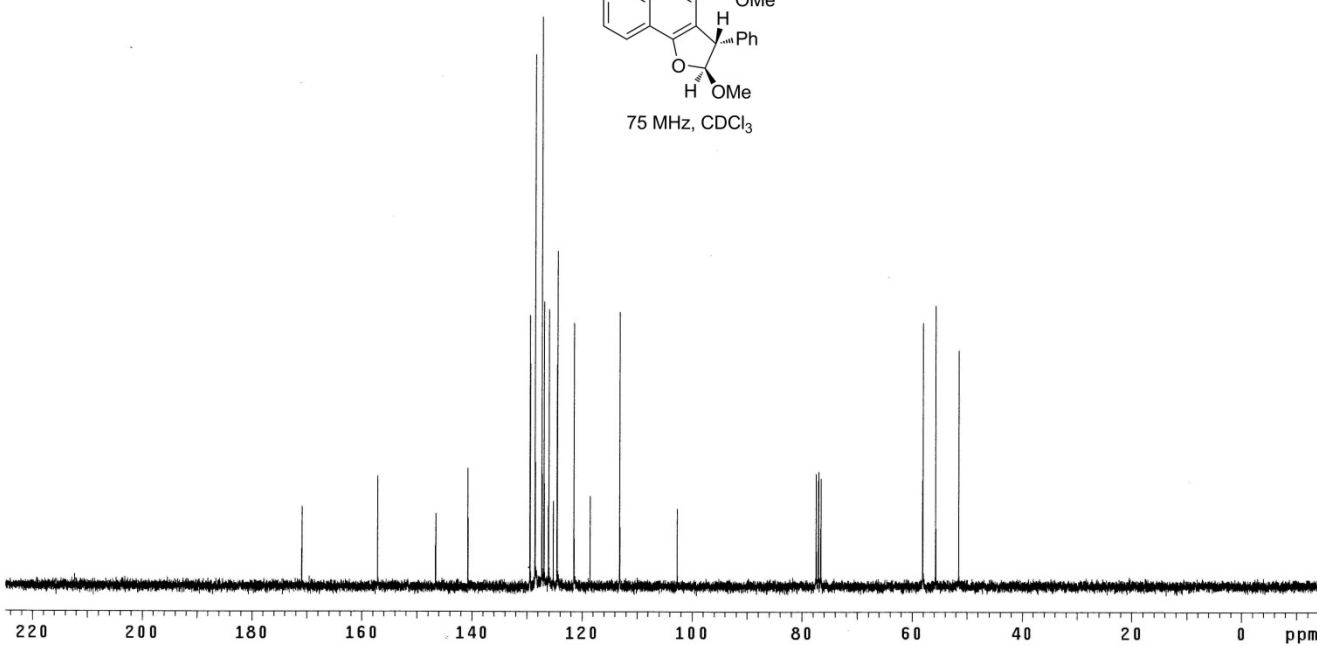
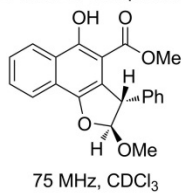
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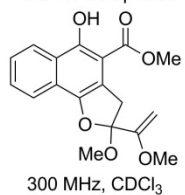
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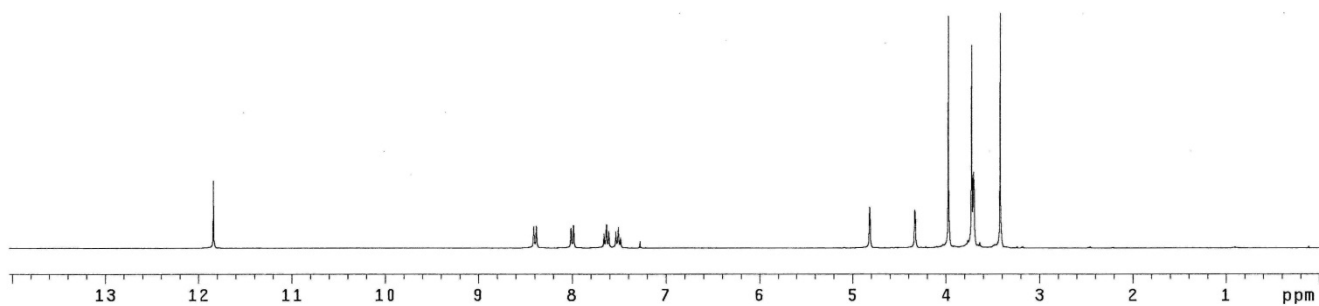
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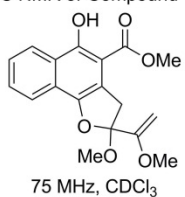
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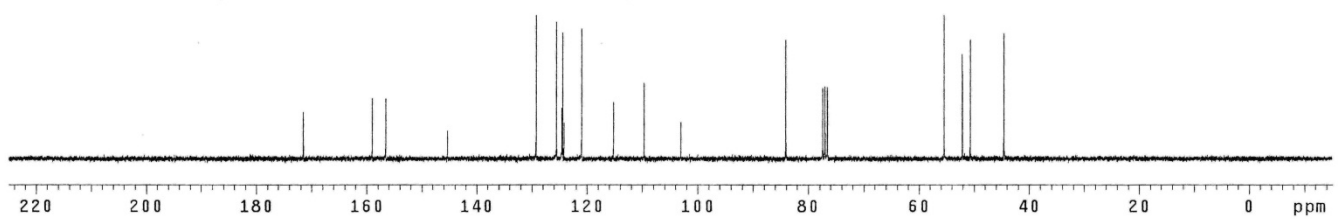
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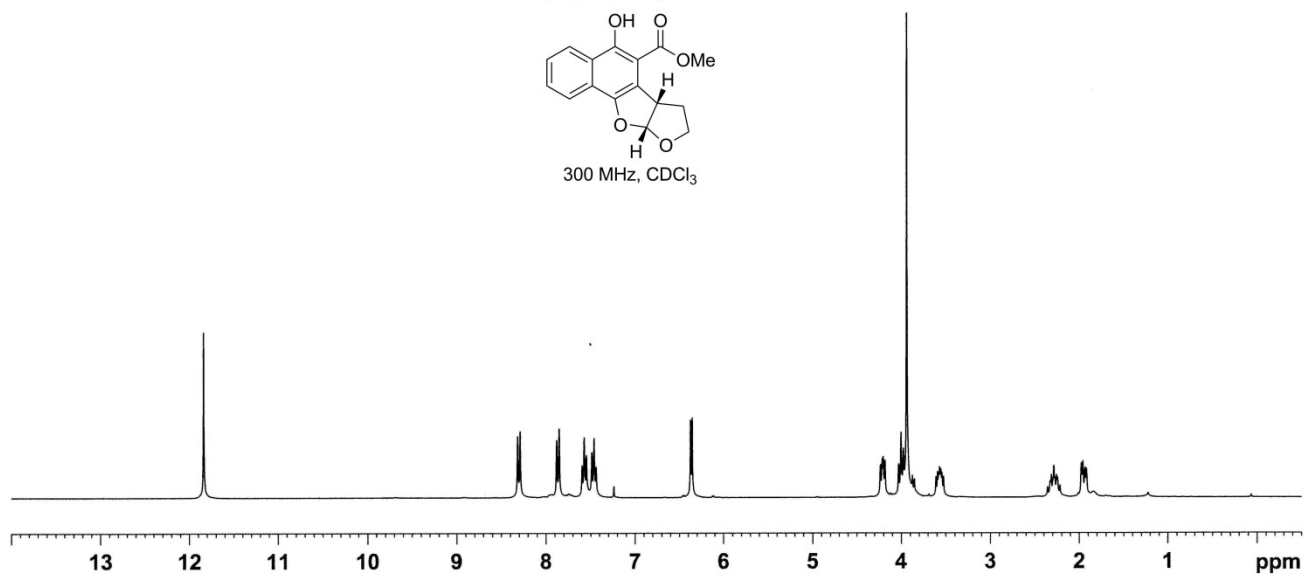
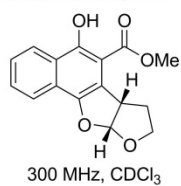
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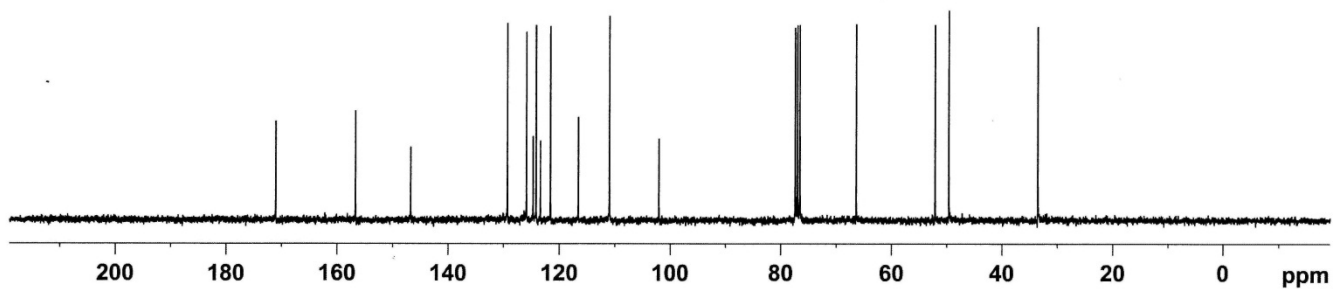
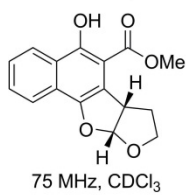
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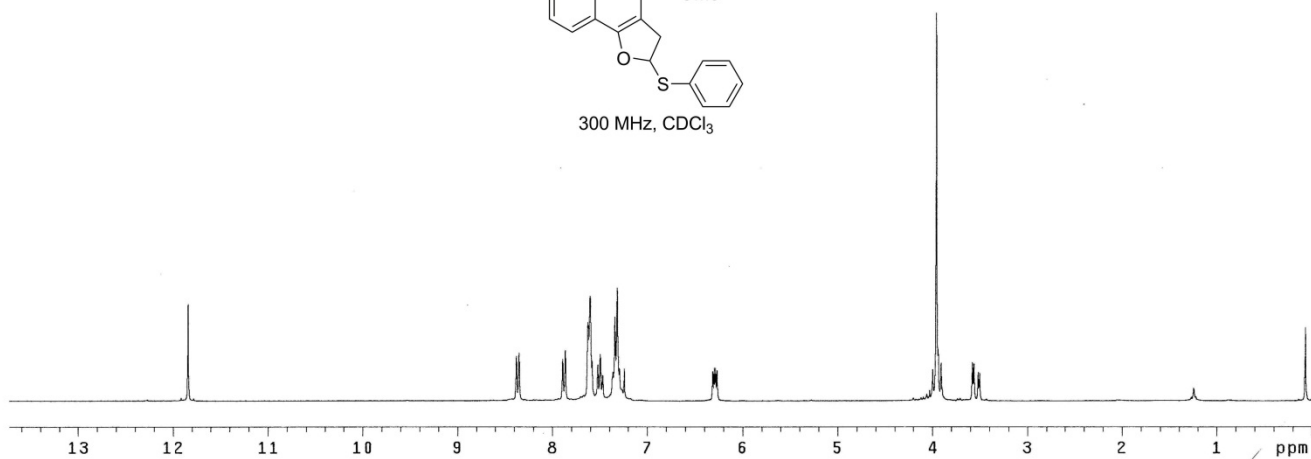
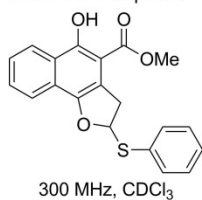
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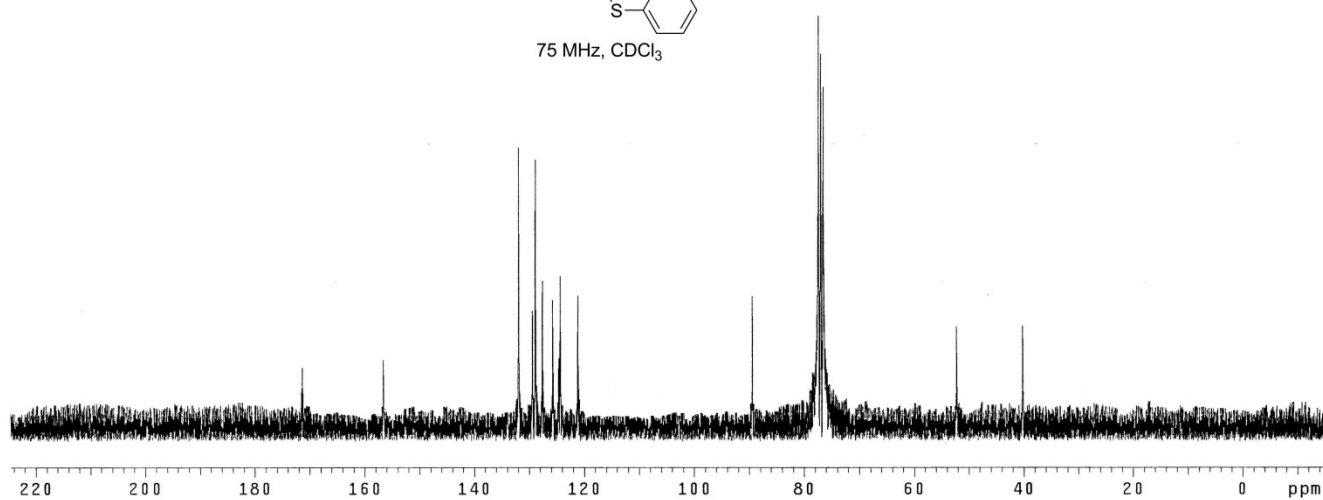
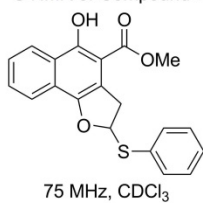
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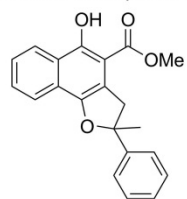
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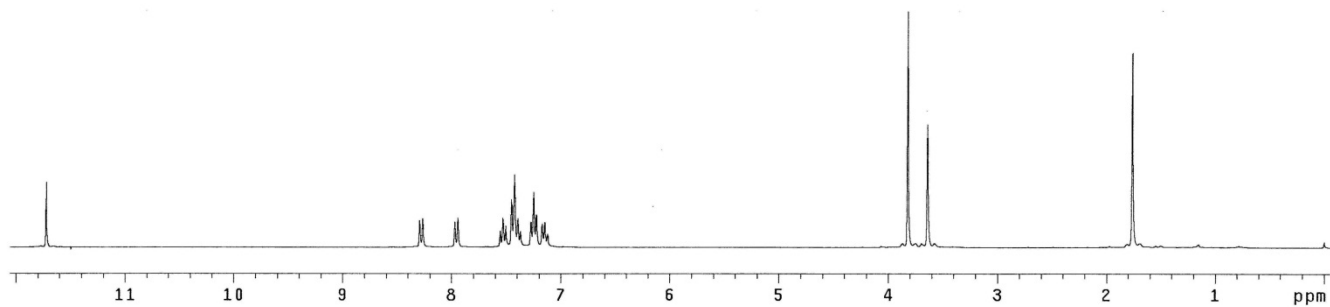
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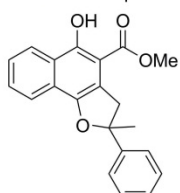
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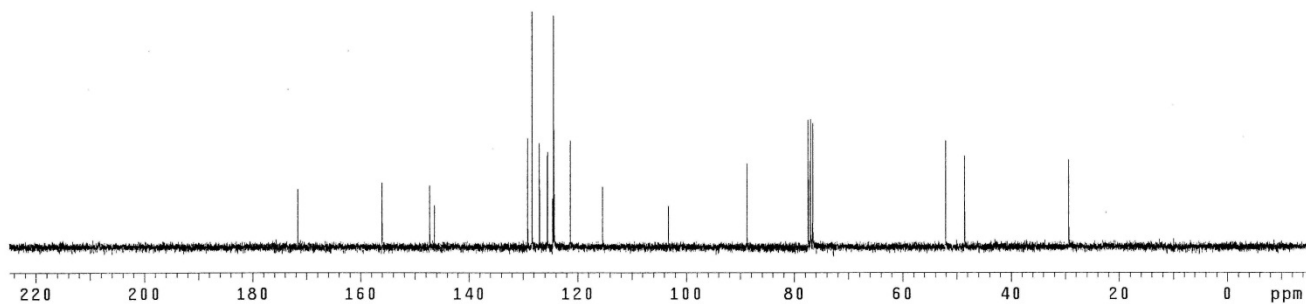
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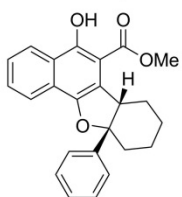
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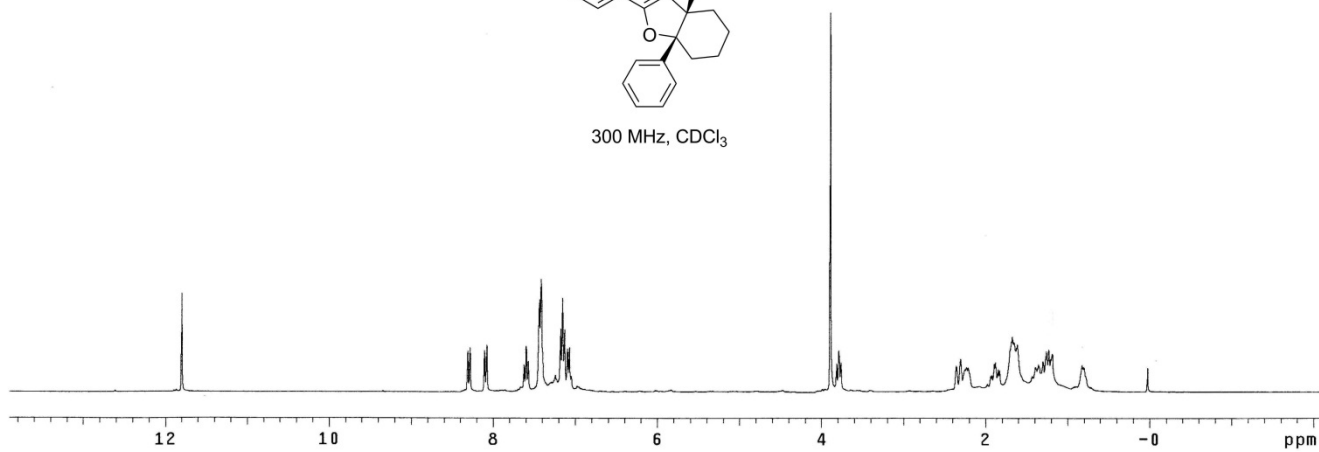
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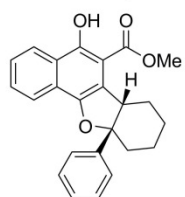
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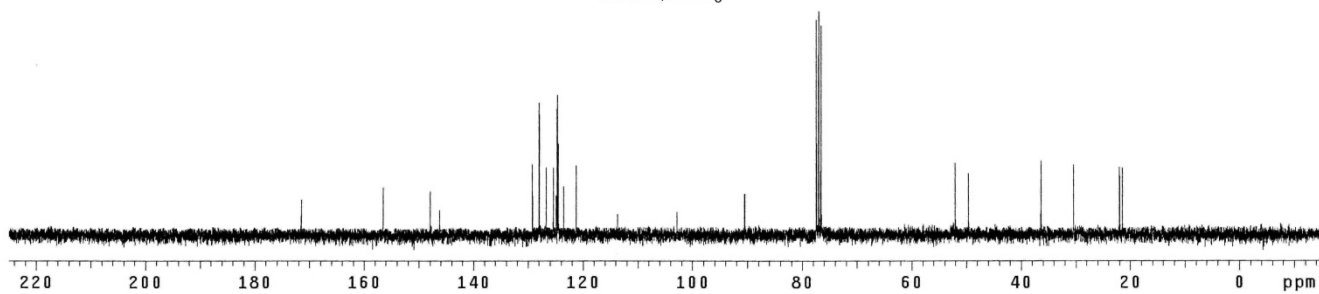
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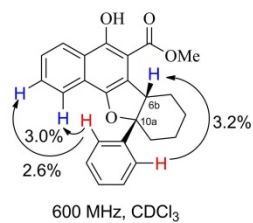
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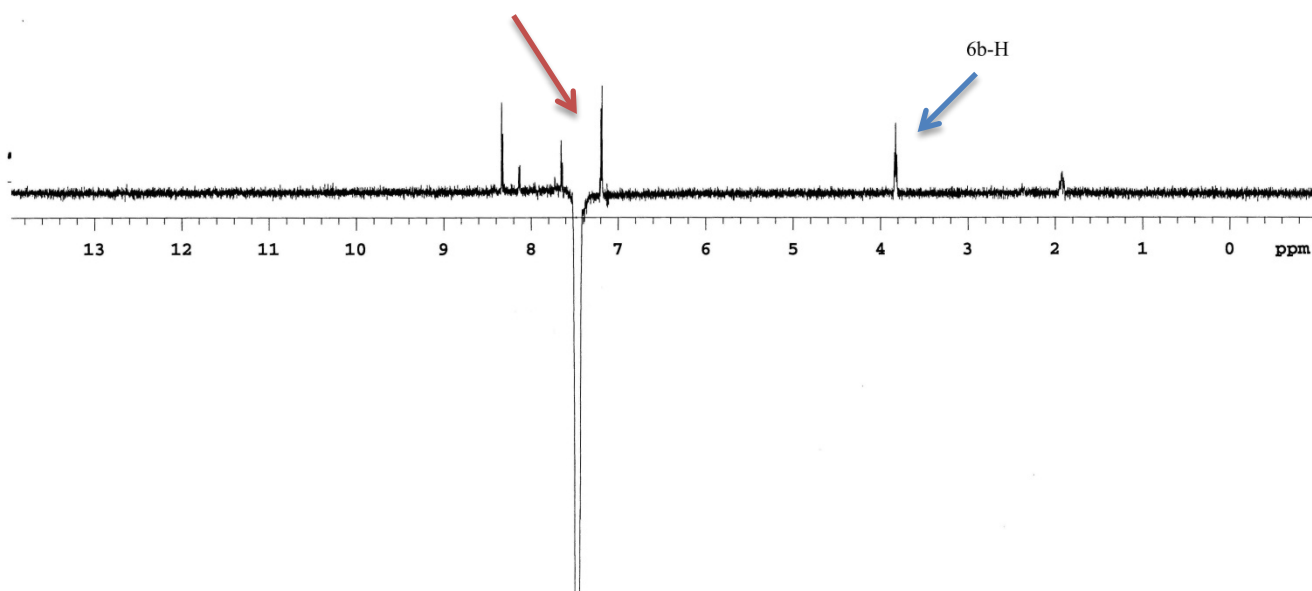
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1-D NOE NMR Spectrum of Compound **19**

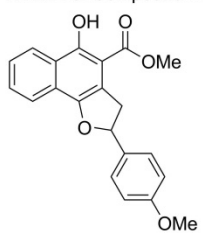


Irradiated at the aromatic proton that appeared at  $\delta$  7.42 ppm

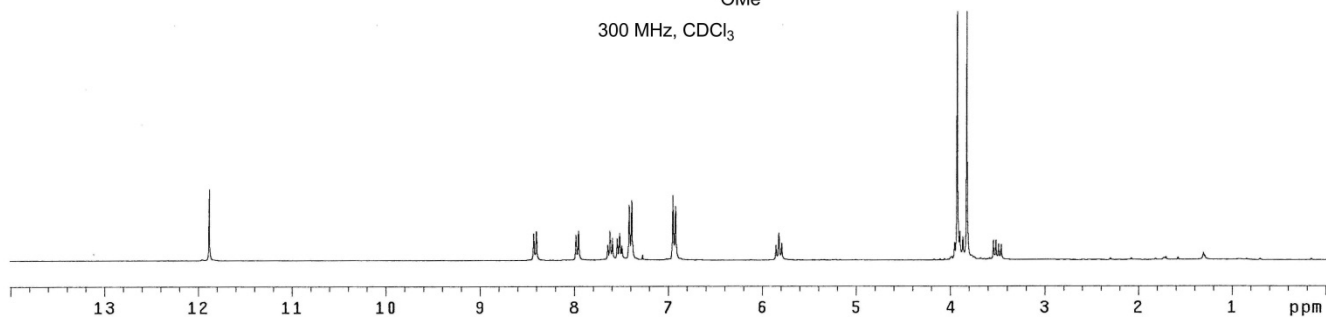




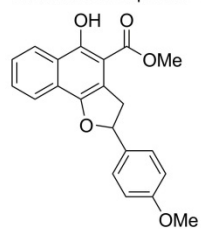
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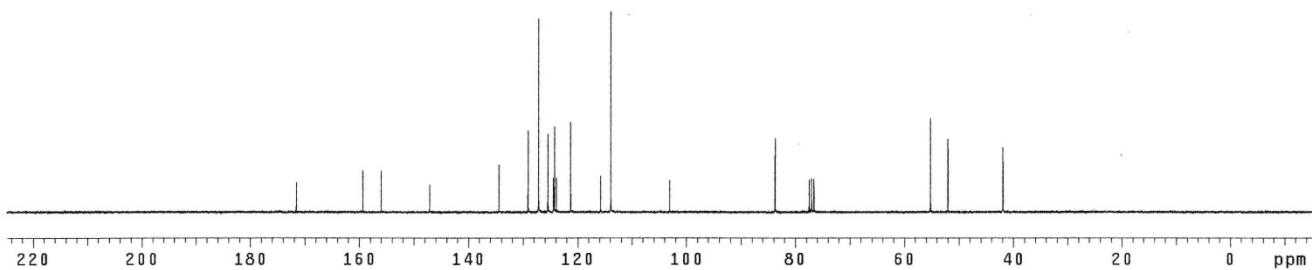
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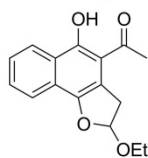
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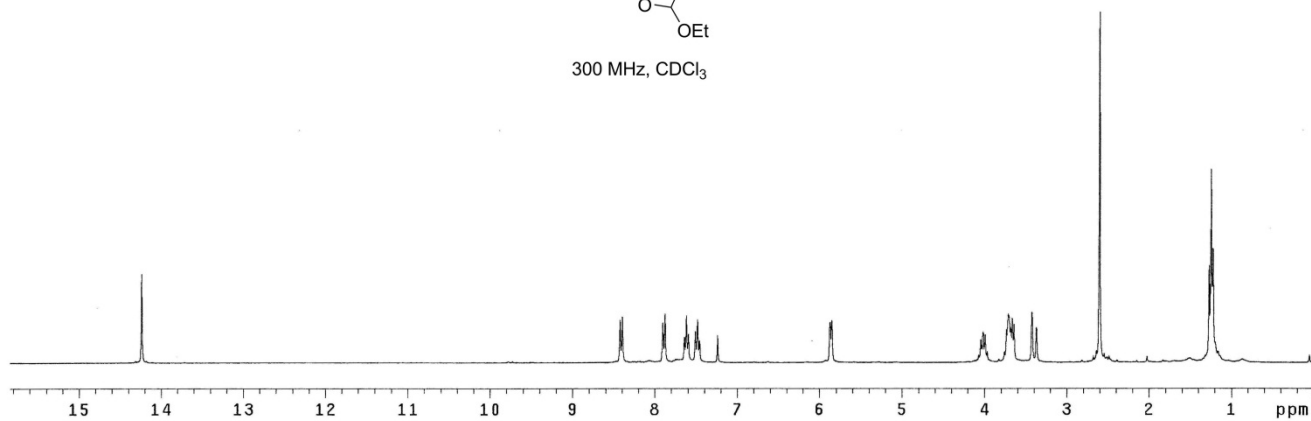
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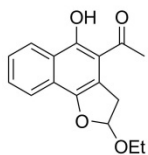
<sup>1</sup>H NMR of Compound 21



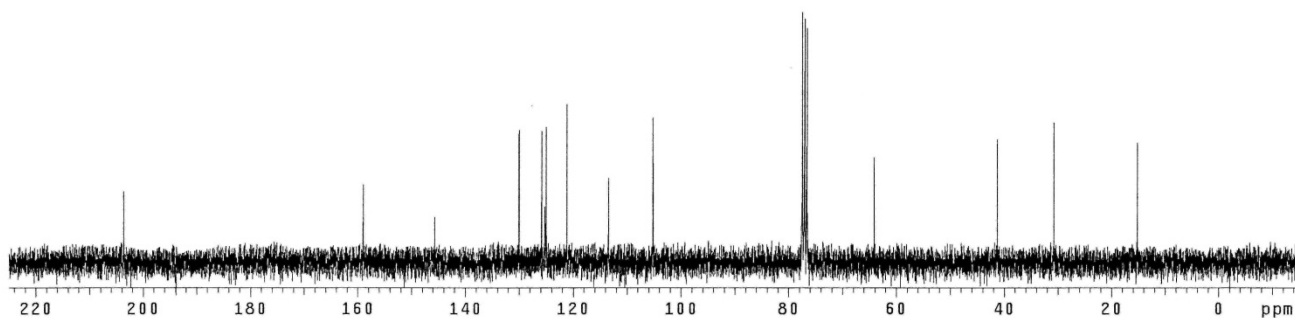
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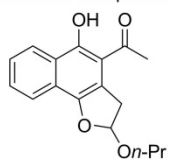
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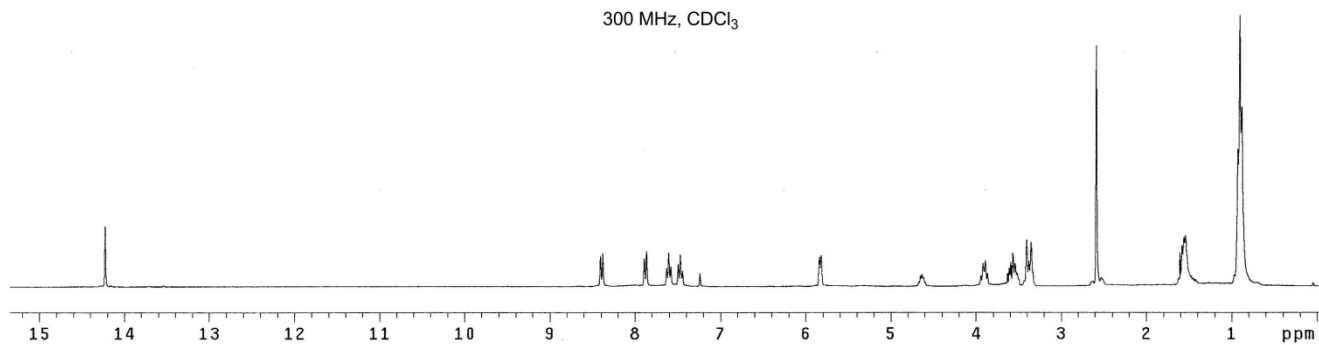
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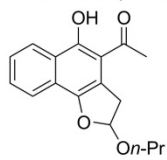
$^1\text{H}$  NMR of Compound 22



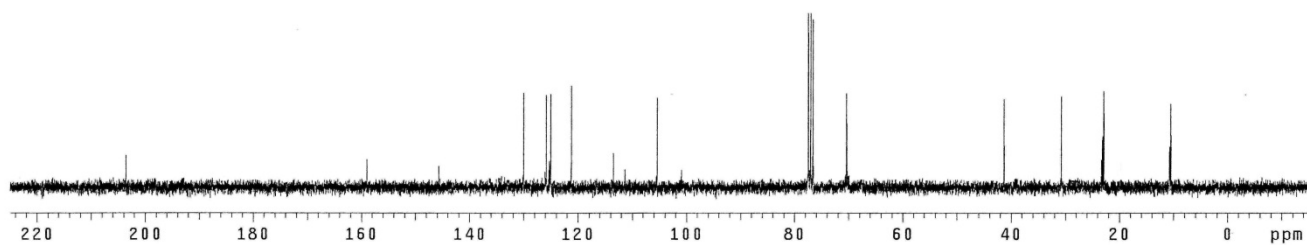
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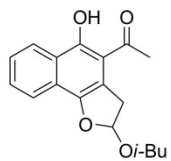
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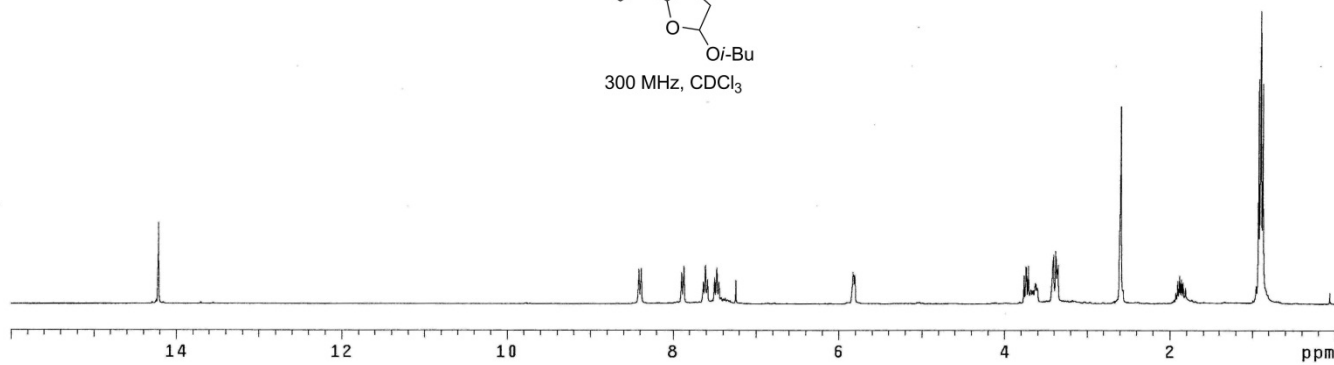
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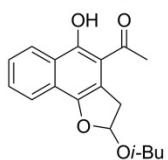
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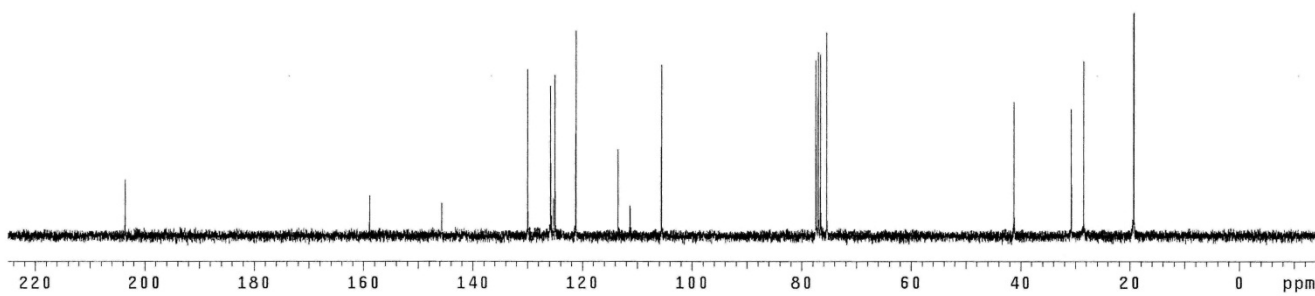
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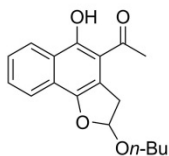
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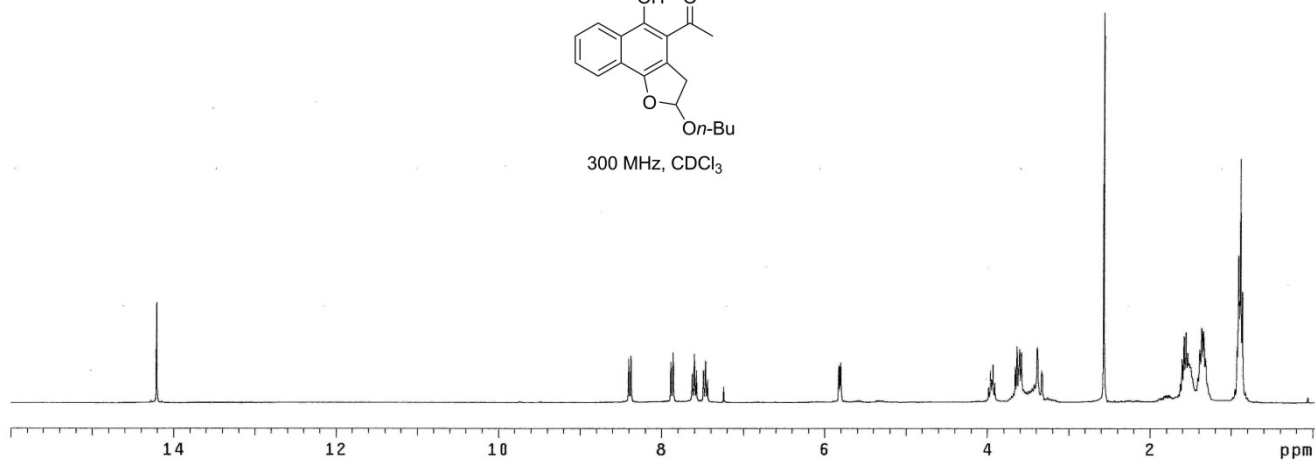
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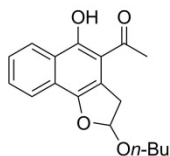
<sup>1</sup>H NMR of Compound **24**



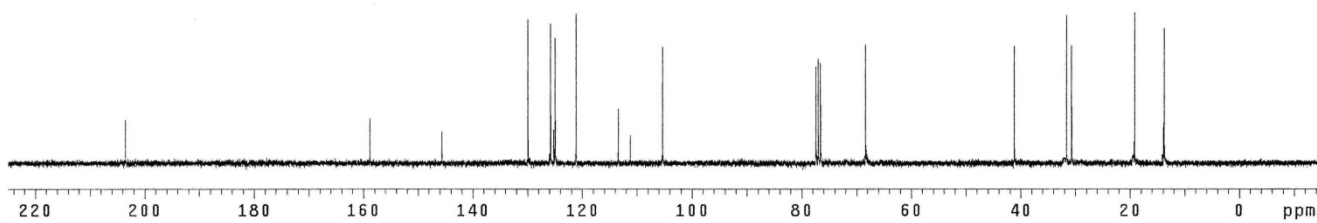
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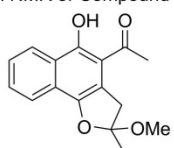
<sup>13</sup>C NMR of Compound **24**



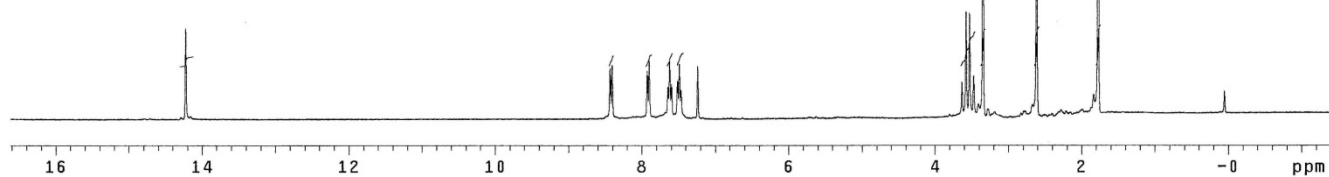
75 MHz, CDCl<sub>3</sub>



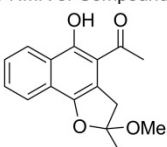
<sup>1</sup>H NMR of Compound 25



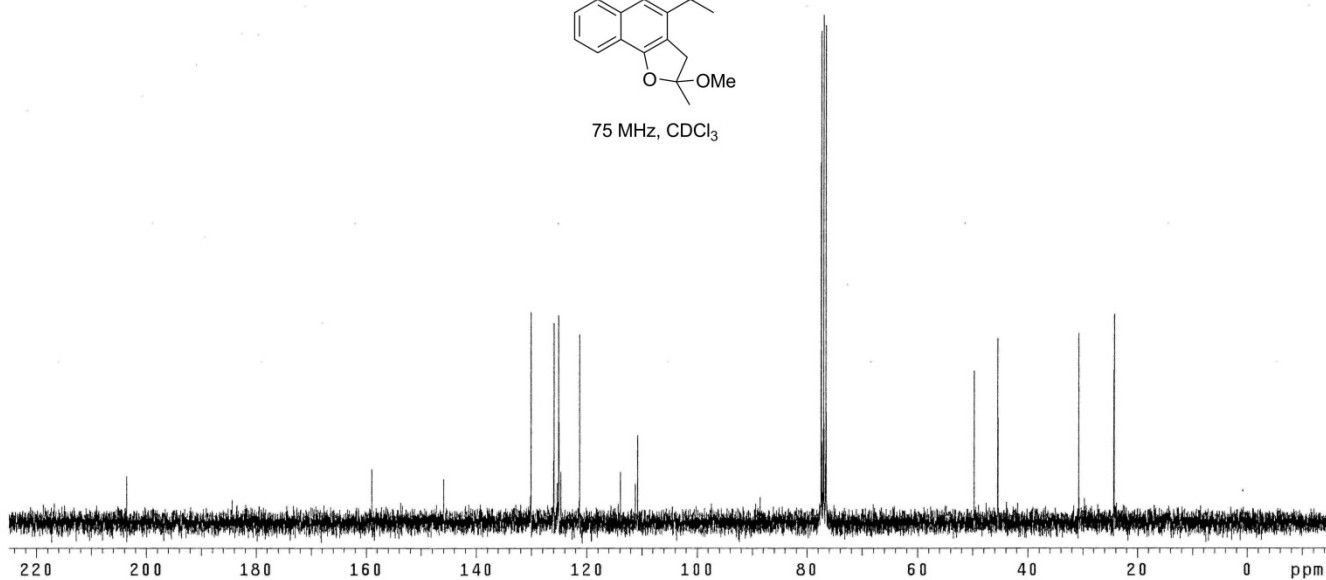
300 MHz, CDCl<sub>3</sub>



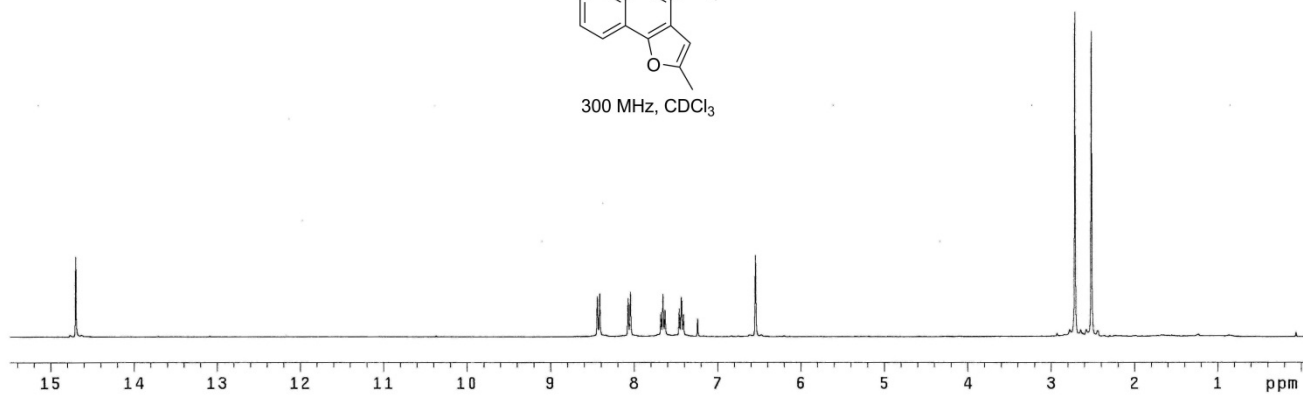
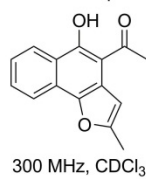
<sup>13</sup>C NMR of Compound 25



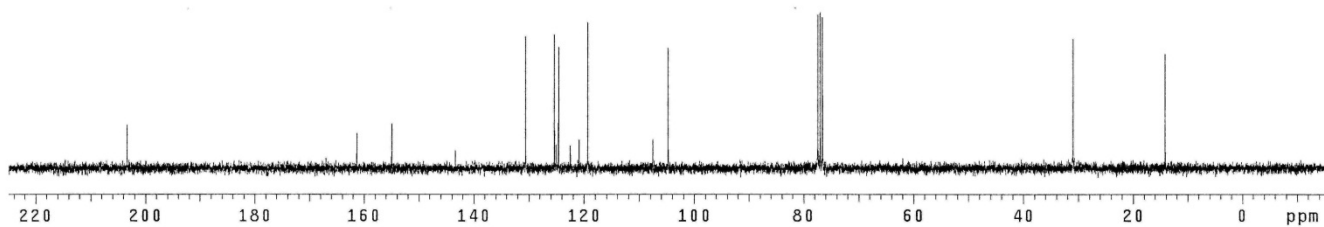
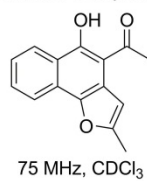
75 MHz, CDCl<sub>3</sub>



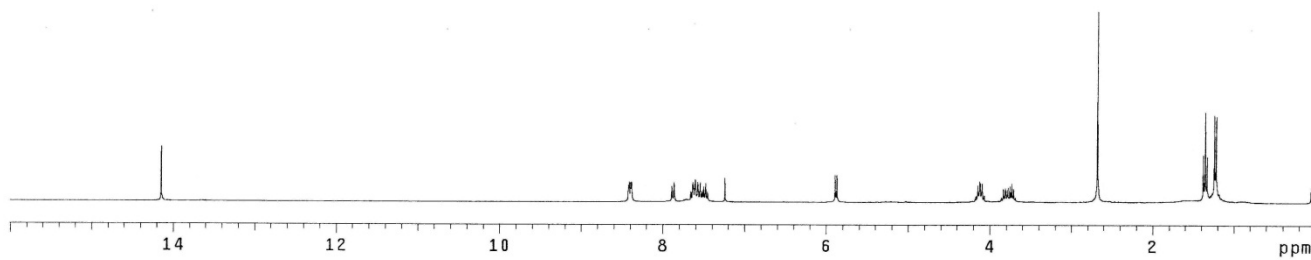
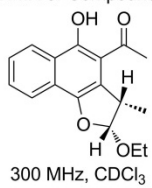
<sup>1</sup>H NMR of Compound 26



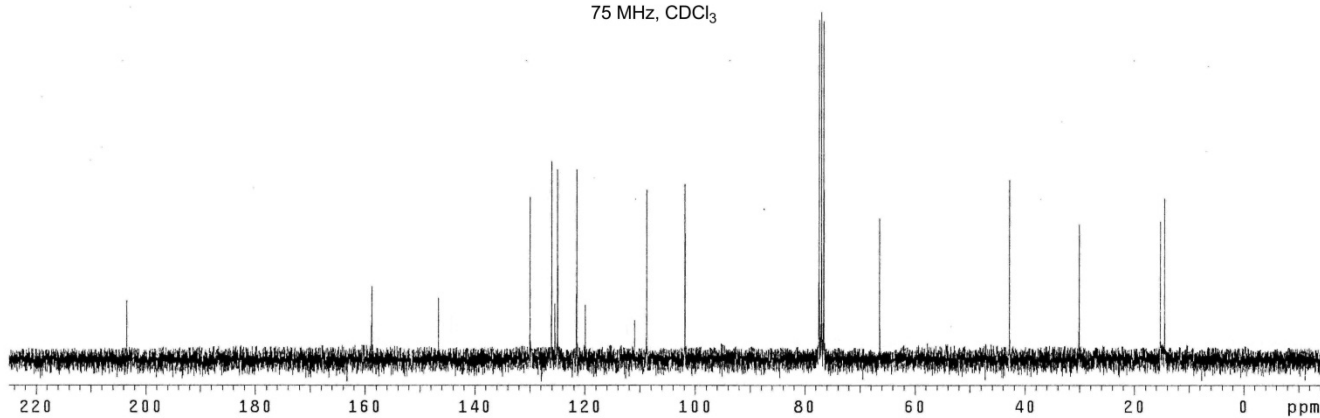
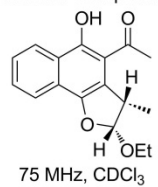
<sup>13</sup>C NMR of Compound 26



<sup>1</sup>H NMR of Compound 27

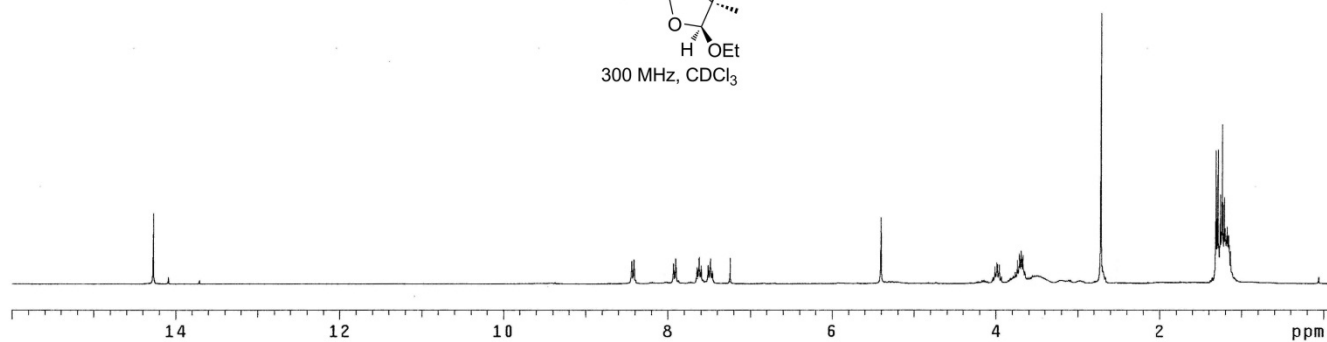
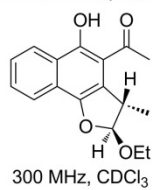


<sup>13</sup>C NMR of Compound 27

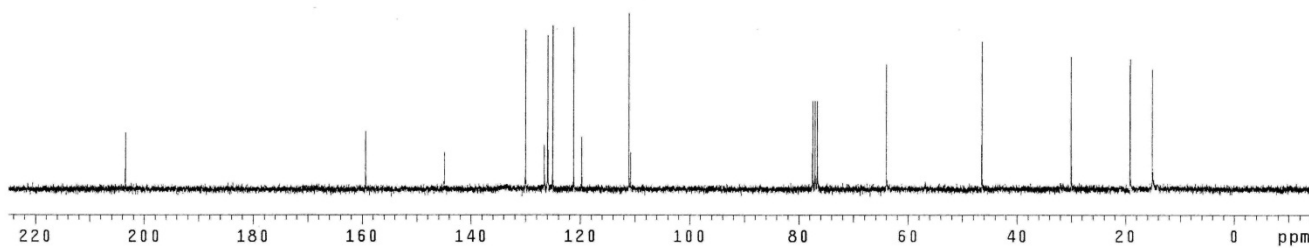
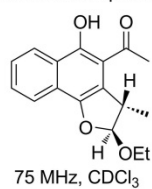




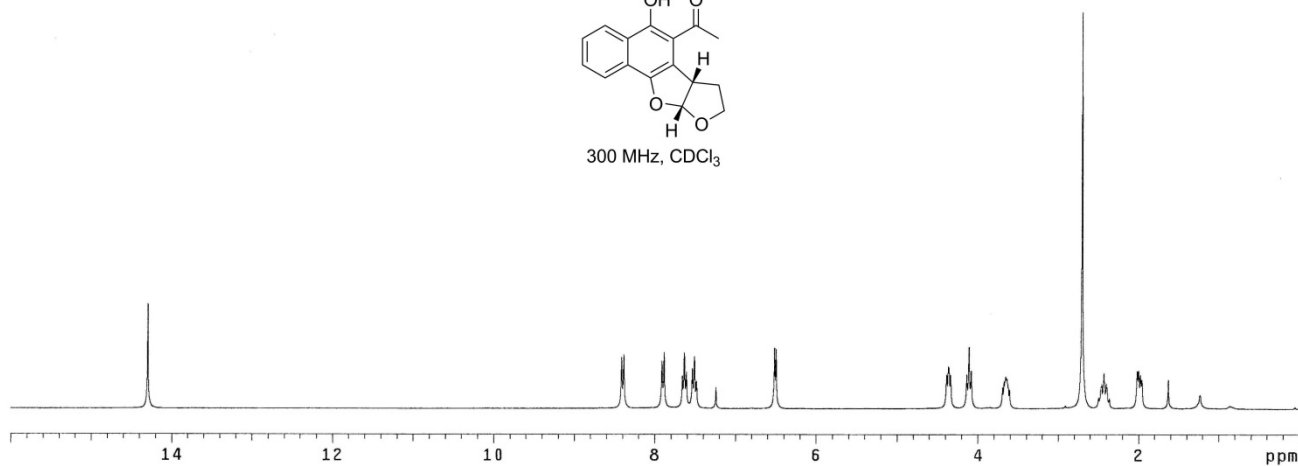
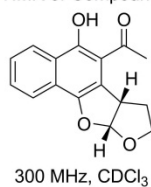
<sup>1</sup>H NMR of Compound **28**



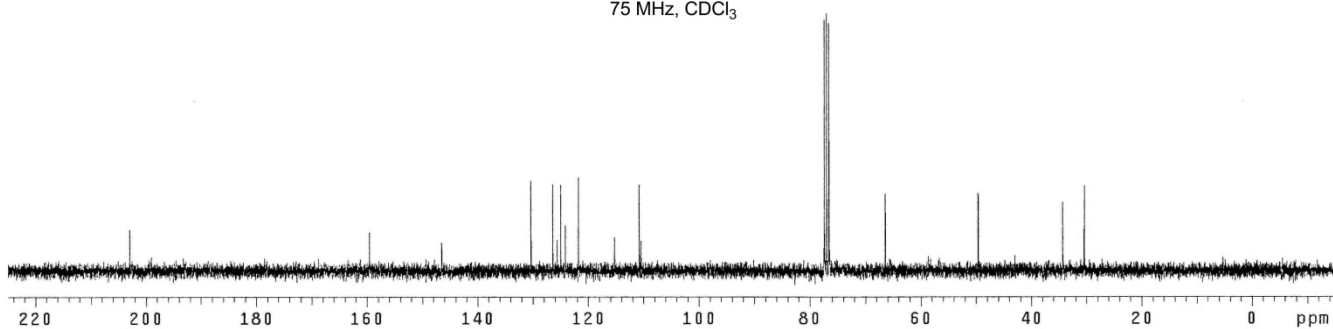
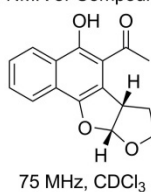
<sup>13</sup>C NMR of Compound **28**



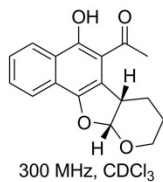
<sup>1</sup>H NMR of Compound **29**



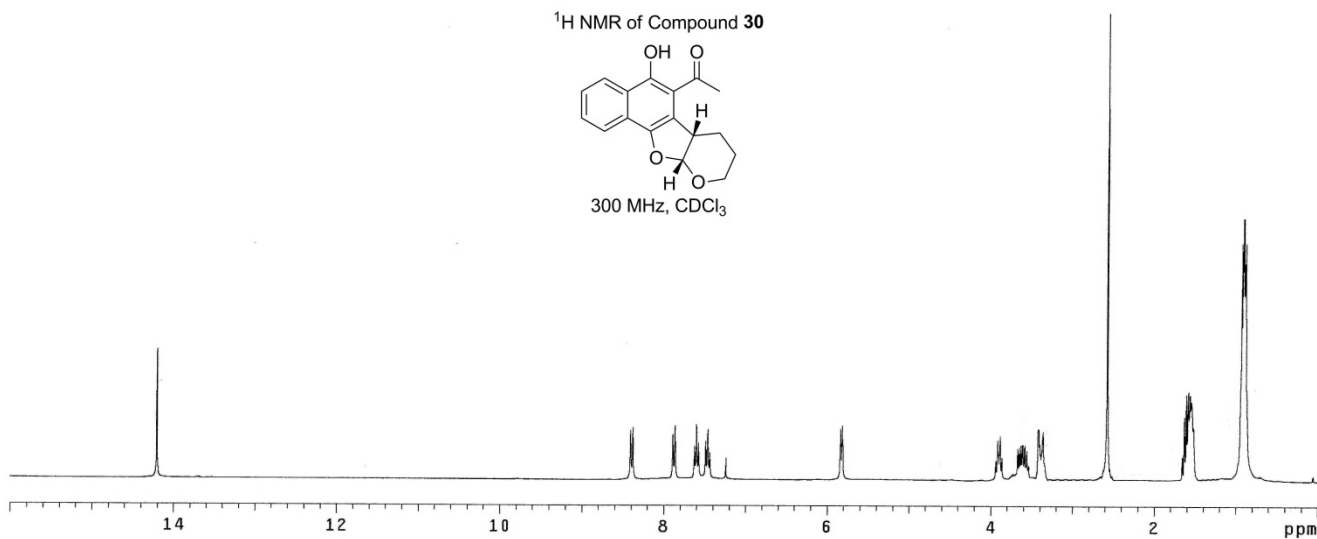
<sup>13</sup>C NMR of Compound **29**



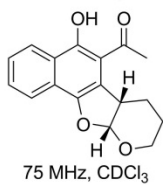
<sup>1</sup>H NMR of Compound 30



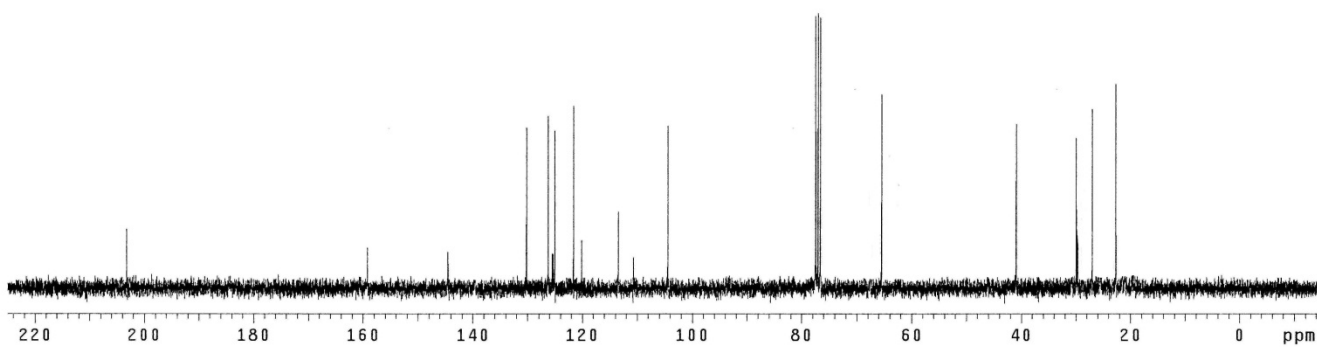
300 MHz, CDCl<sub>3</sub>



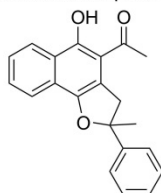
<sup>13</sup>C NMR of Compound 30



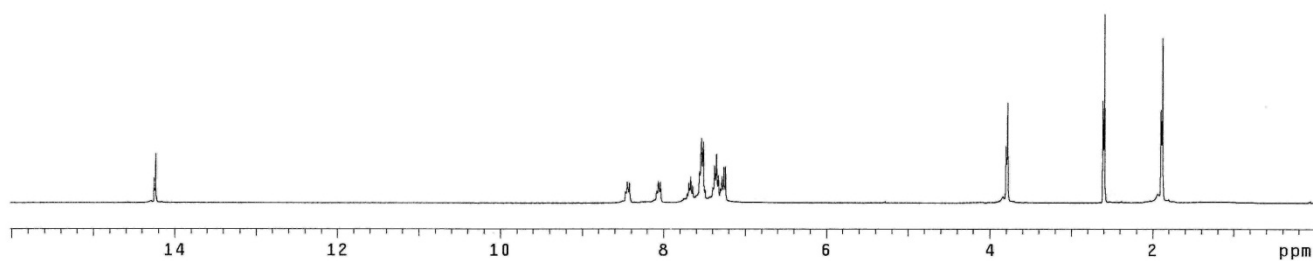
75 MHz, CDCl<sub>3</sub>



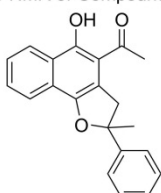
<sup>1</sup>H NMR of Compound 31



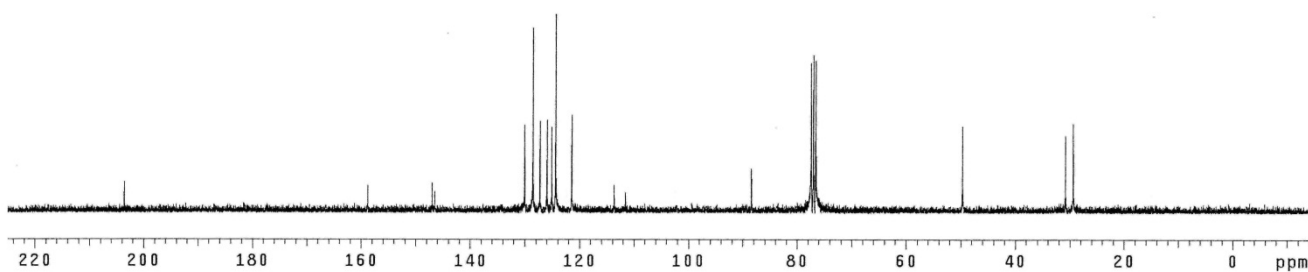
300 MHz, CDCl<sub>3</sub>



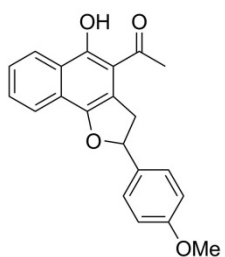
<sup>13</sup>C NMR of Compound 31



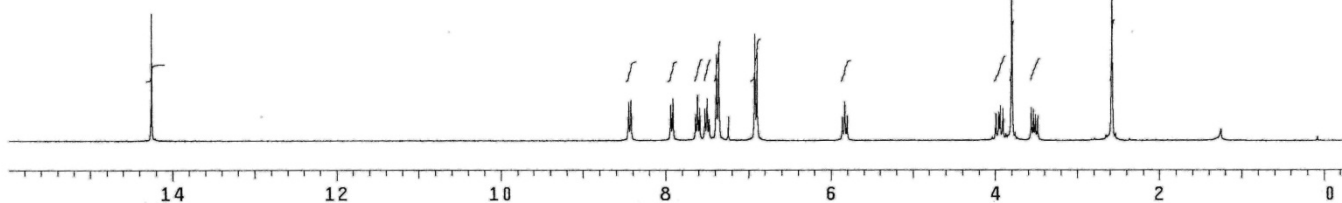
75 MHz, CDCl<sub>3</sub>



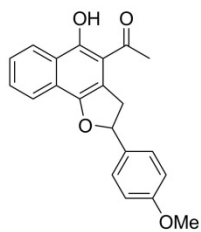
<sup>1</sup>H NMR of Compound **32**



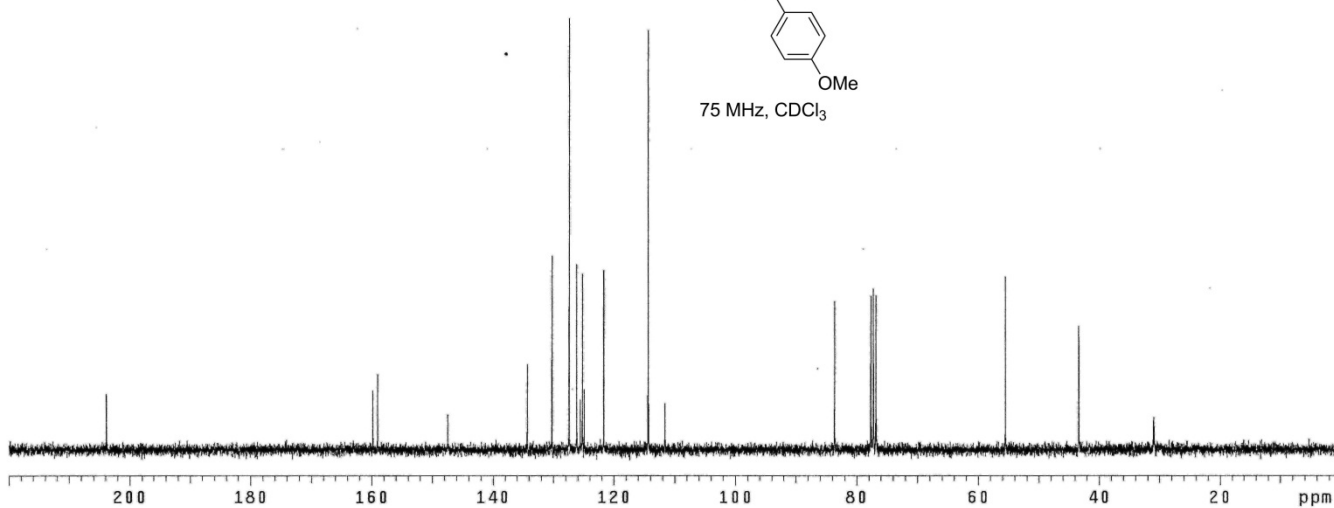
300 MHz, CDCl<sub>3</sub>



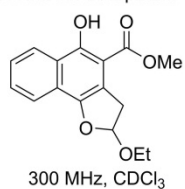
<sup>13</sup>C NMR of Compound **32**



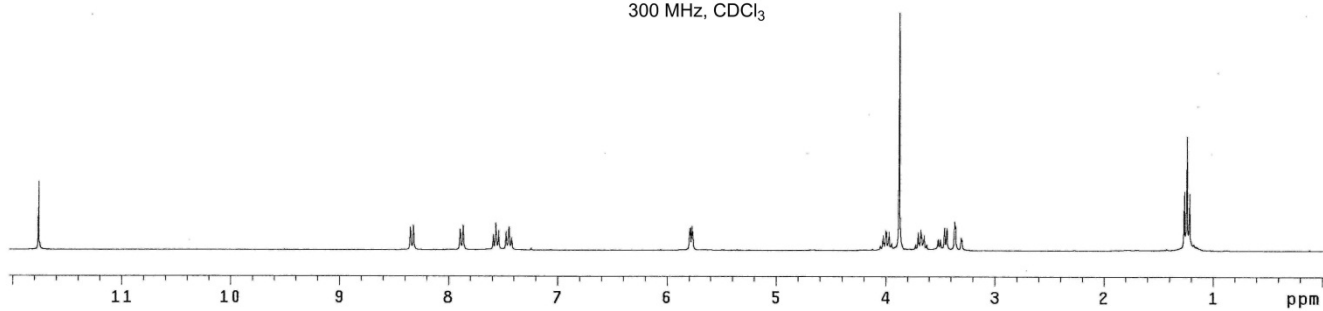
75 MHz, CDCl<sub>3</sub>



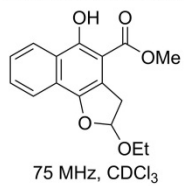
<sup>1</sup>H NMR of Compound **39**



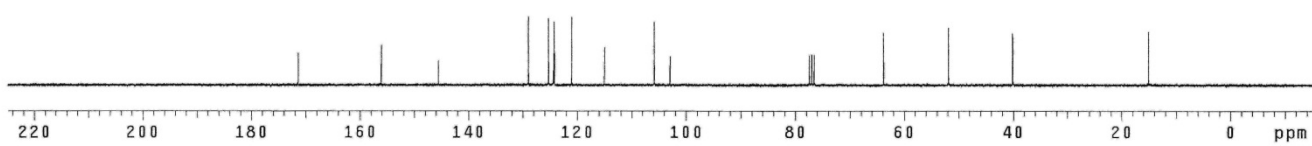
300 MHz, CDCl<sub>3</sub>



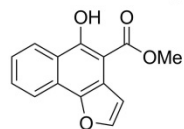
<sup>13</sup>C NMR of Compound **39**



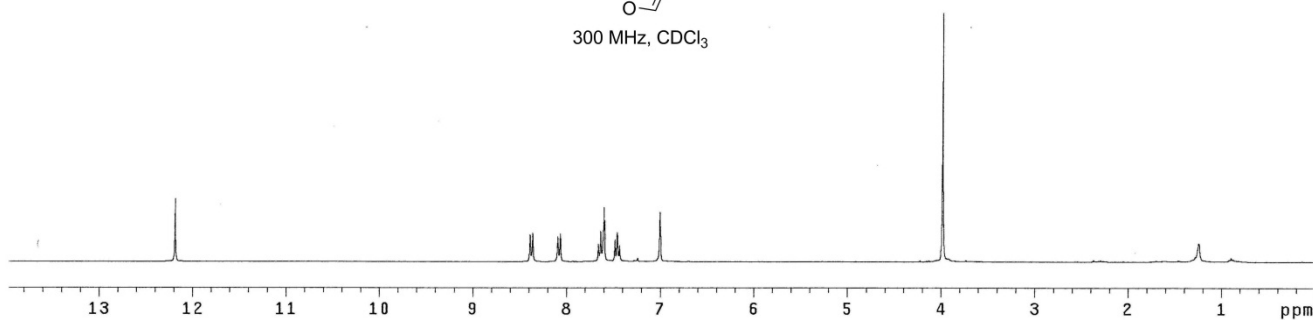
75 MHz, CDCl<sub>3</sub>



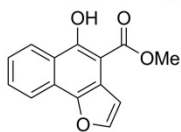
<sup>1</sup>H NMR of Furomollugin (5)



300 MHz, CDCl<sub>3</sub>



<sup>13</sup>C NMR of Furomollugin (5)



75 MHz, CDCl<sub>3</sub>

