

## **Recyclable Heterogeneous Copper Oxide on Alumina Catalyzed Coupling of Phenols and Alcohols with Aryl halides under Ligand Free Conditions**

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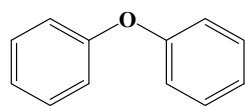
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**Representative Experimental Procedure for the Synthesis of Diaryl Ether by Using CuO on alumina as a Catalyst:** To a stirred solution of iodo benzene (**1a**) (1.0 mmol) and phenol (**2a**) (1.0 mmol) in dry DMSO (2.0 ml) were added CuO on alumina catalyst (13%, 120 mg) and KOH (2.0 equiv) and the reaction mixture was heated at 100 °C under nitrogen atmosphere for 18 h, The progress of the reaction was monitored by TLC. After completion of the reaction, the reaction mixture was extracted with ethyl acetate (3x10 ml). The combined organic layers were dried with anhydrous Na<sub>2</sub>SO<sub>4</sub>. The solvent was evaporated under vacuum to give the crude product, which was purified by column chromatography with hexane as eluent to yield the expected product **3a** (166 mg, 98%) as yellowish oil. The purity of the product was confirmed by <sup>1</sup>H, <sup>13</sup>C and Mass, IR spectroscopy.

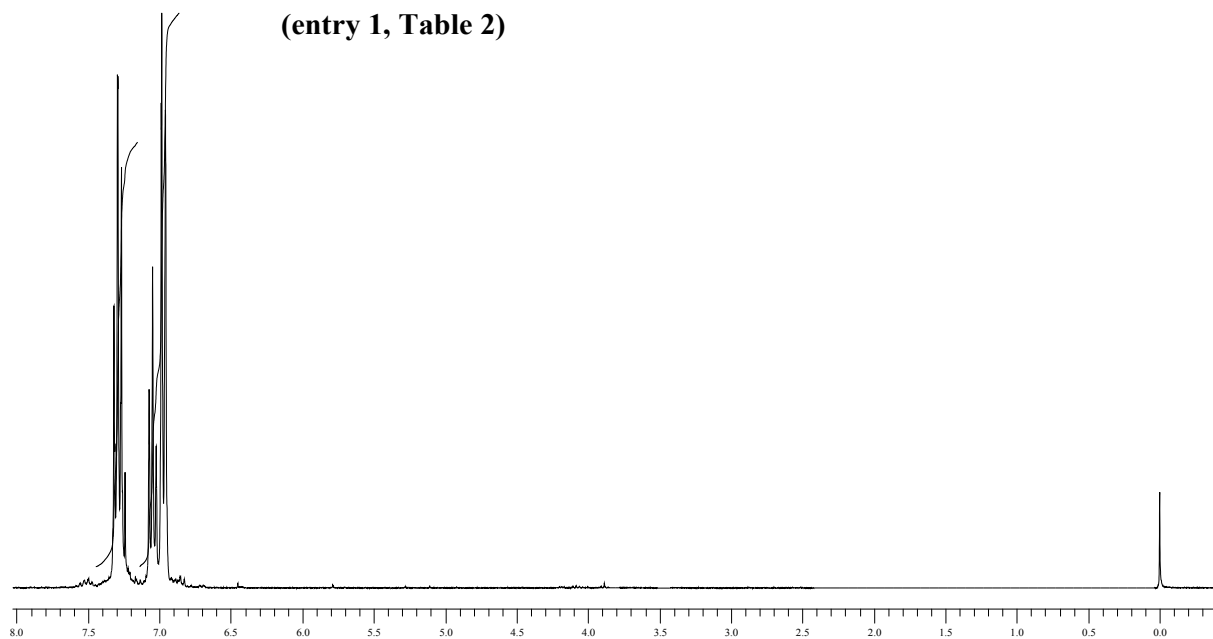
Supplementary Material (ESI) for Organic & Biomolecular Chemistry

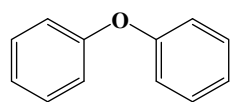
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## **Copies of $^1\text{H}$ NMR and $^{13}\text{C}$ NMR of Compounds**

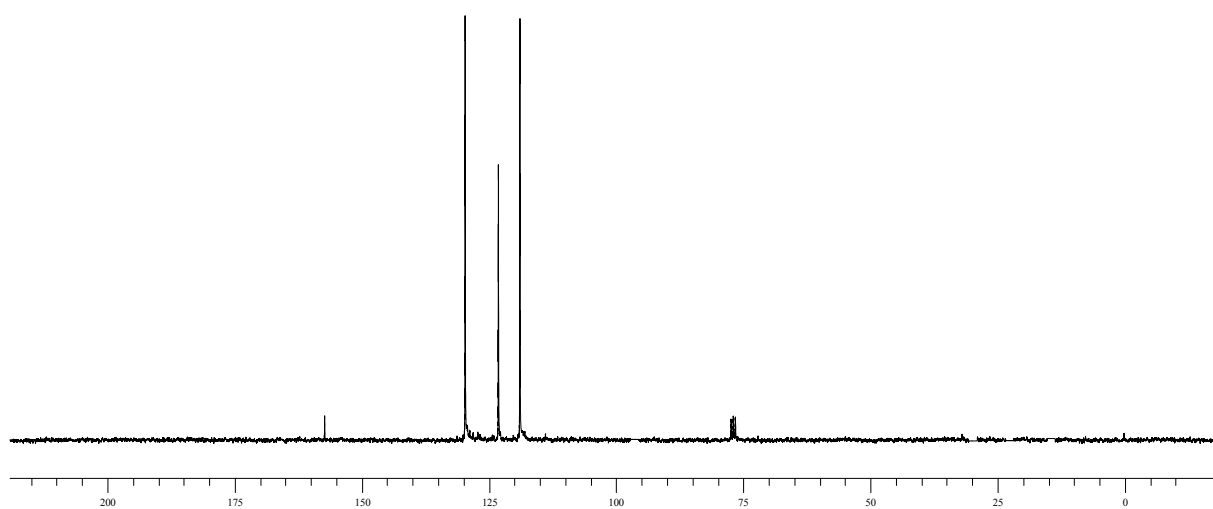


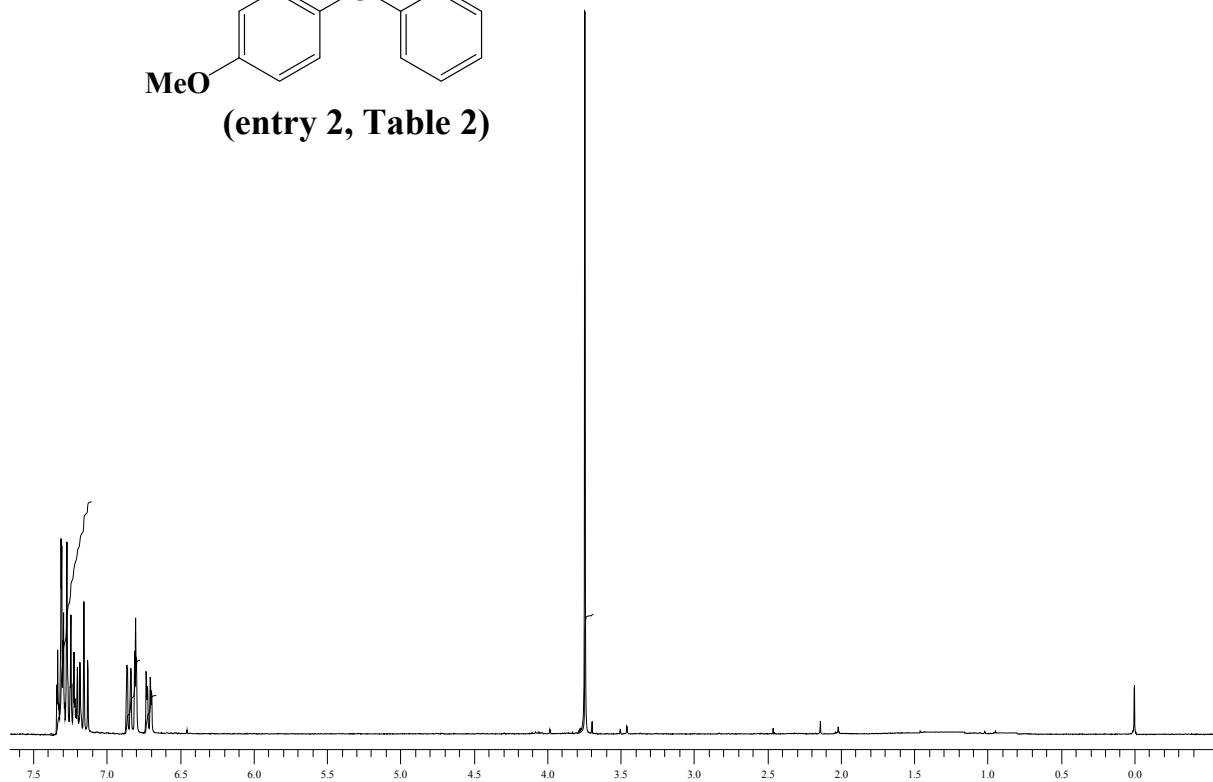
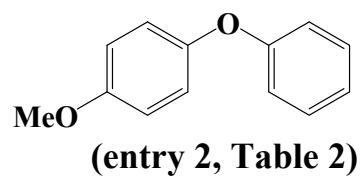
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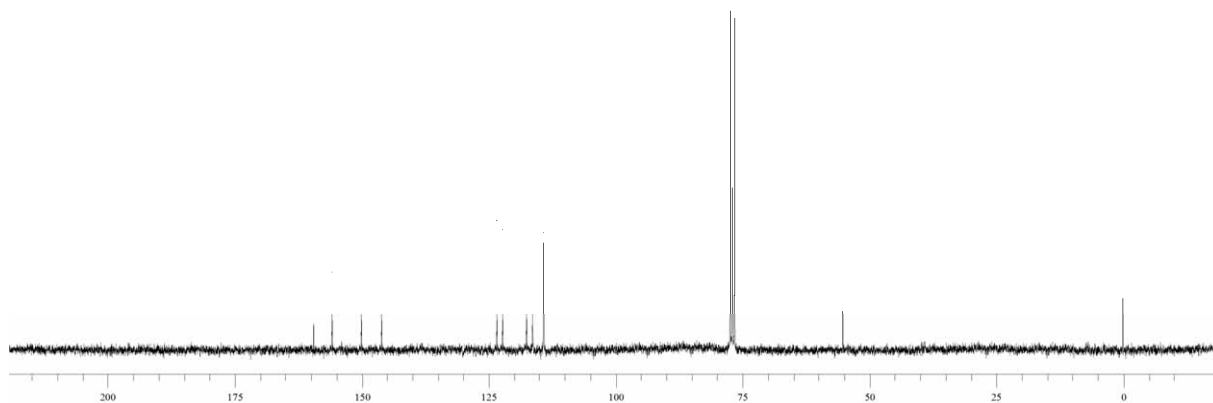
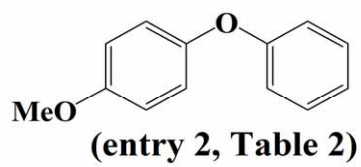




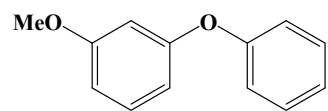
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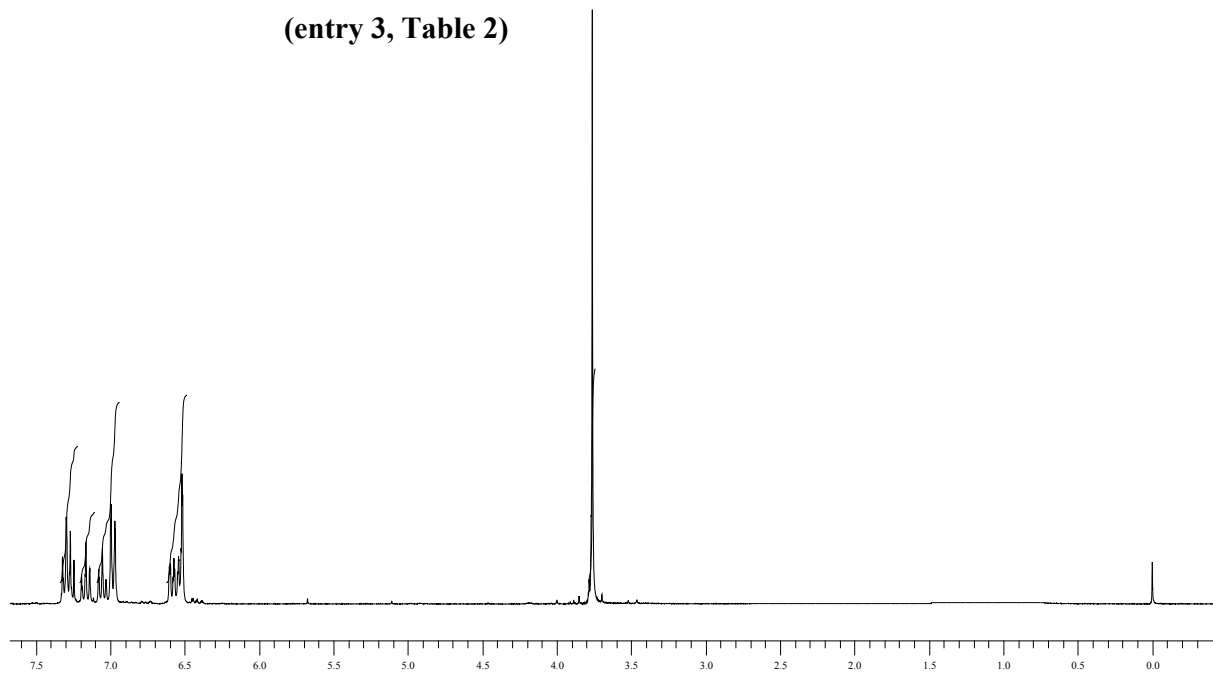


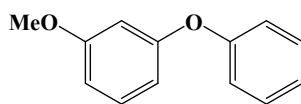




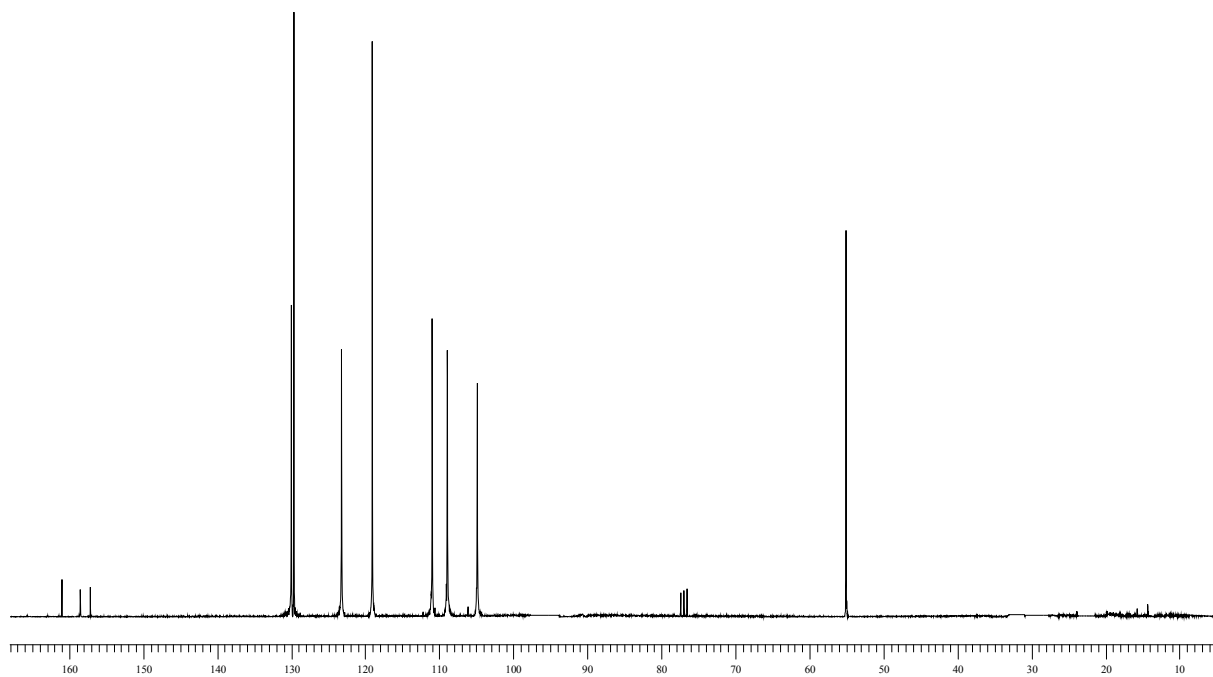


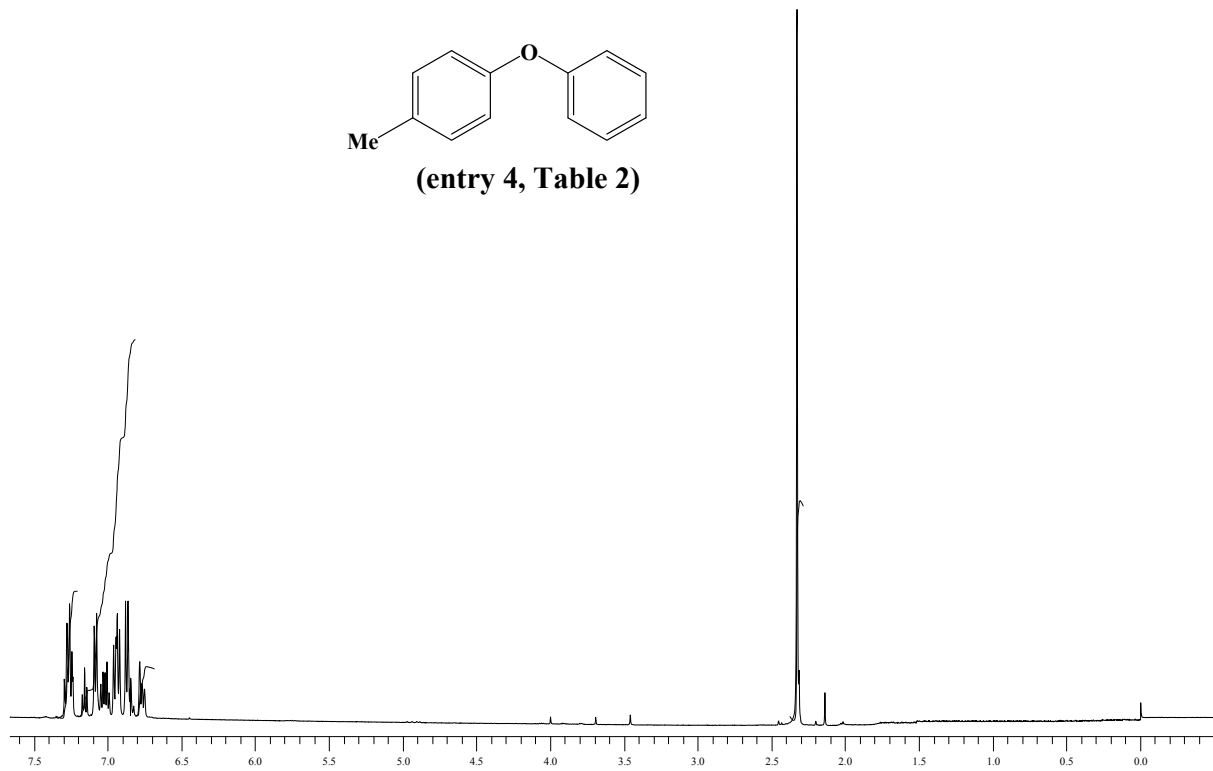
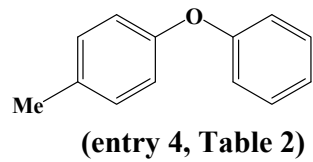
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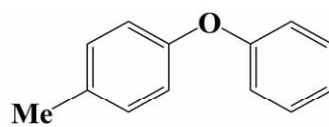




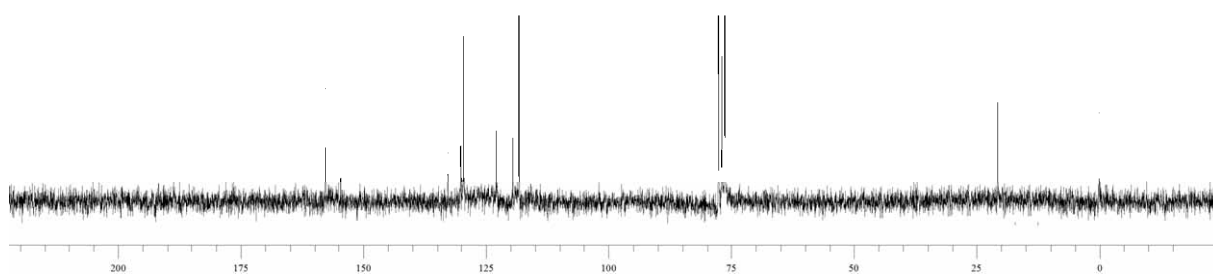
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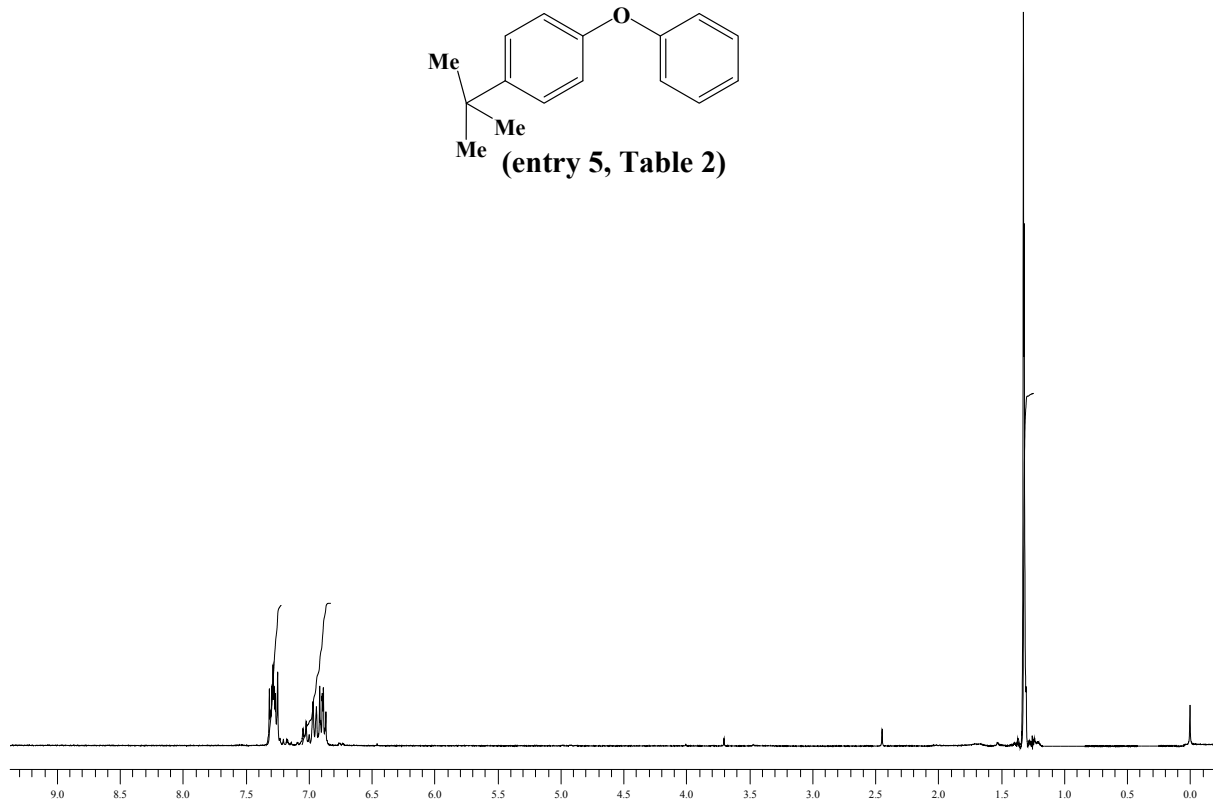
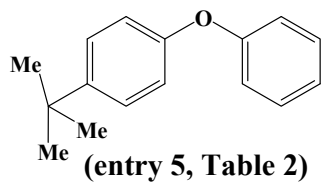


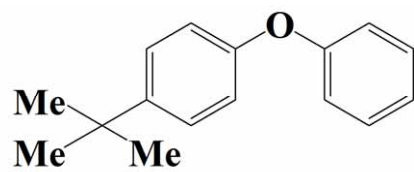




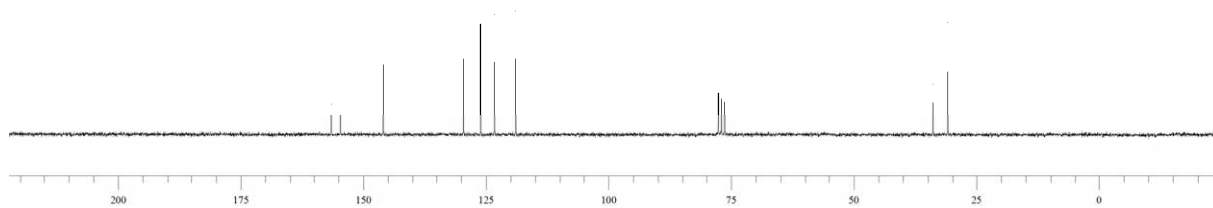
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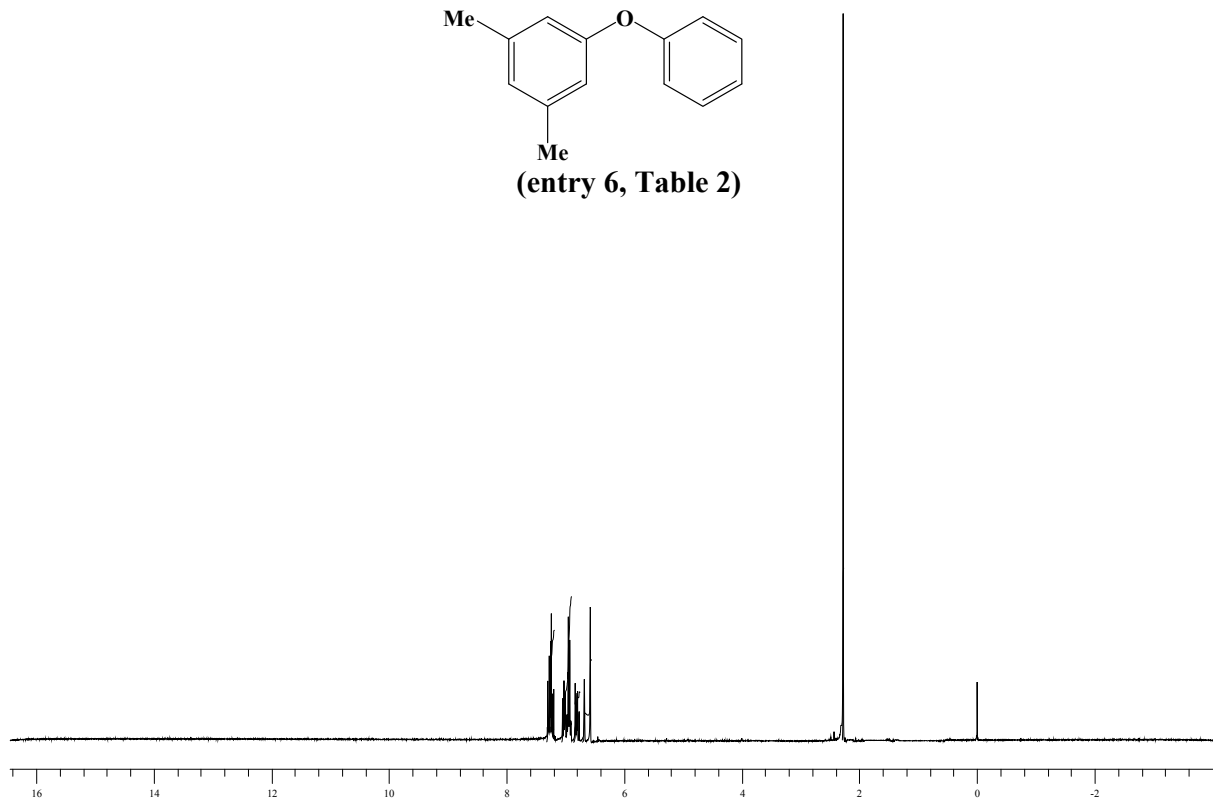
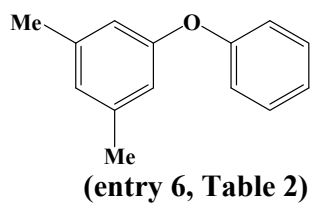


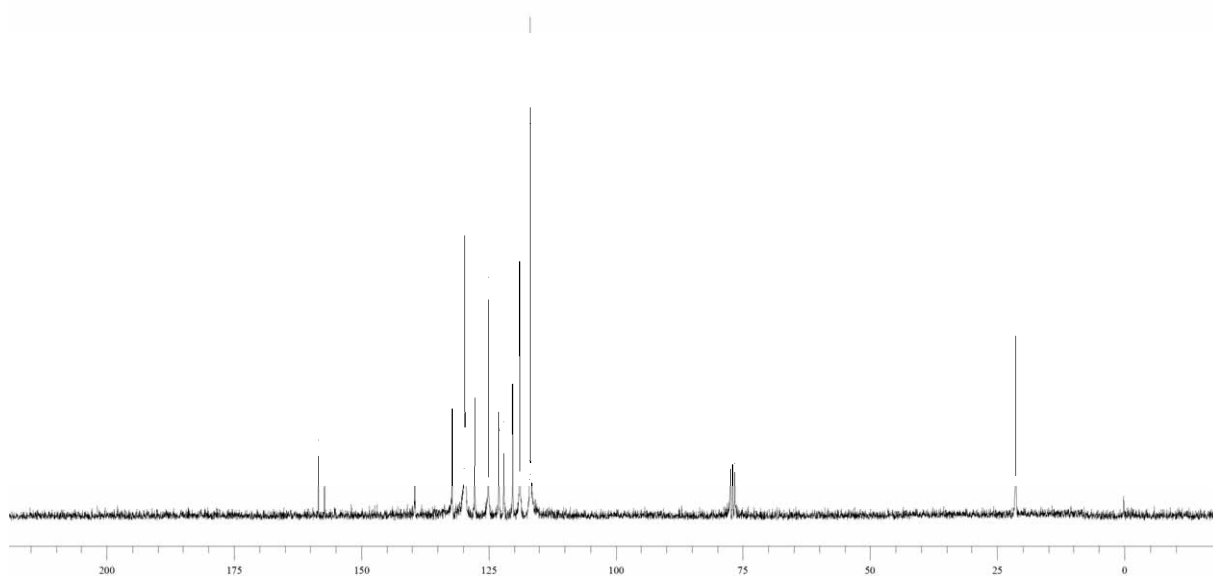
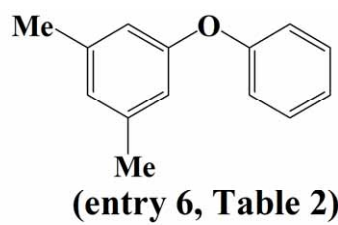




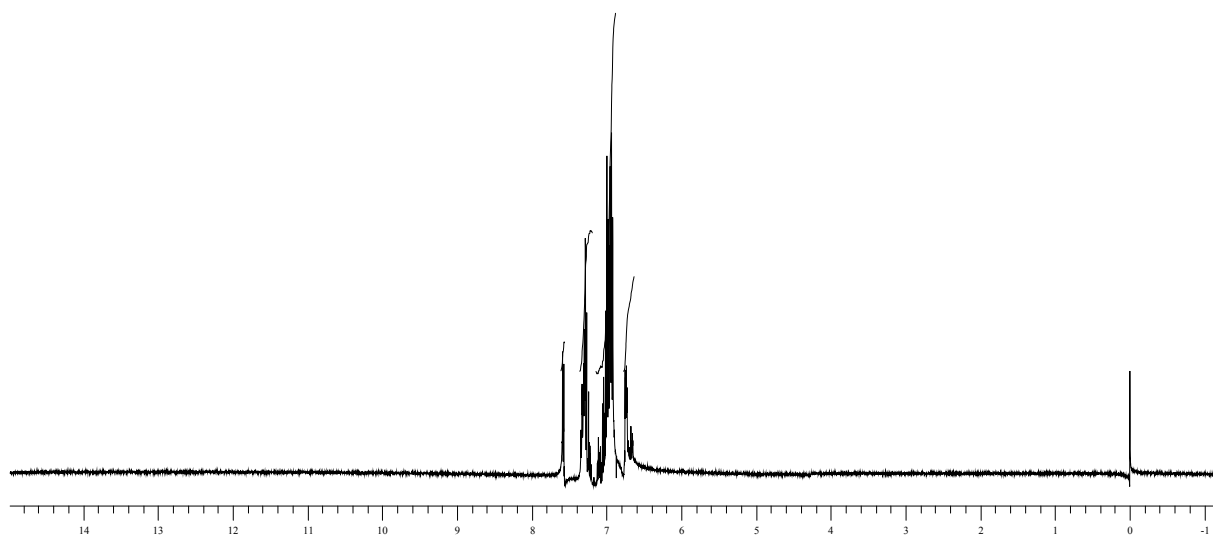
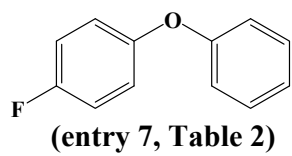
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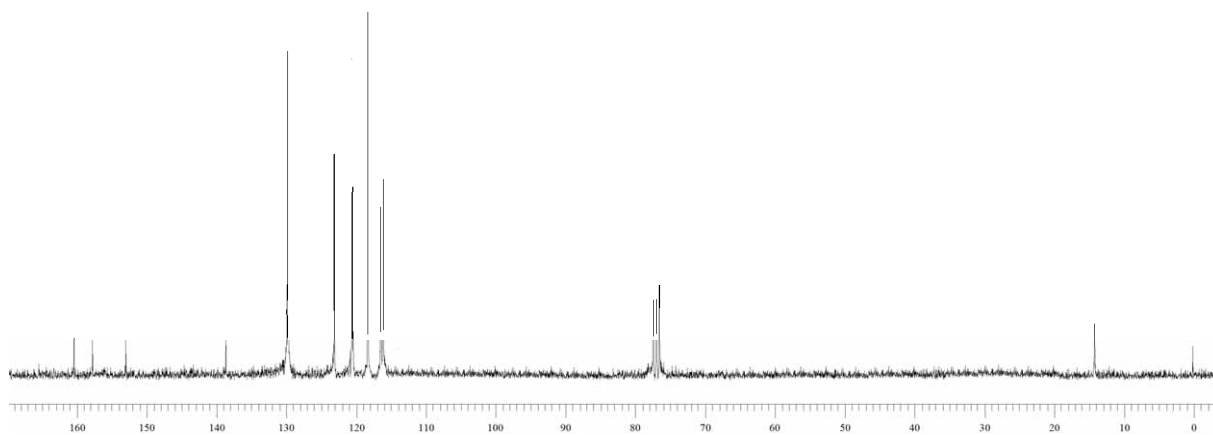
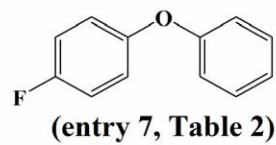


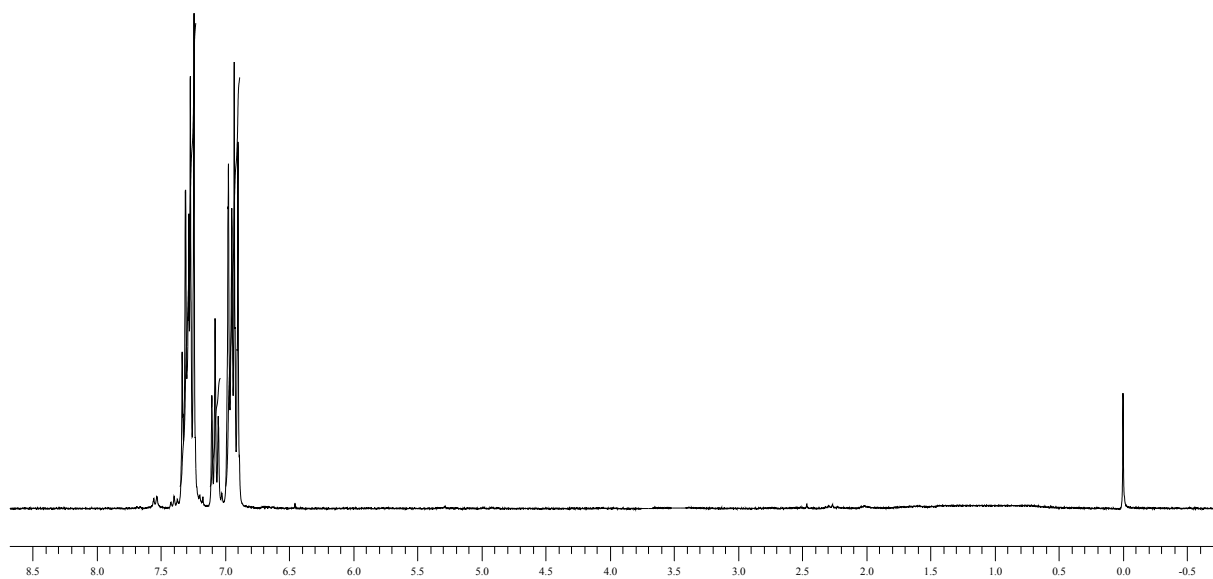
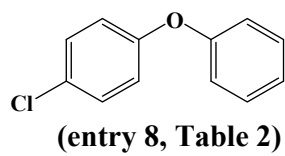


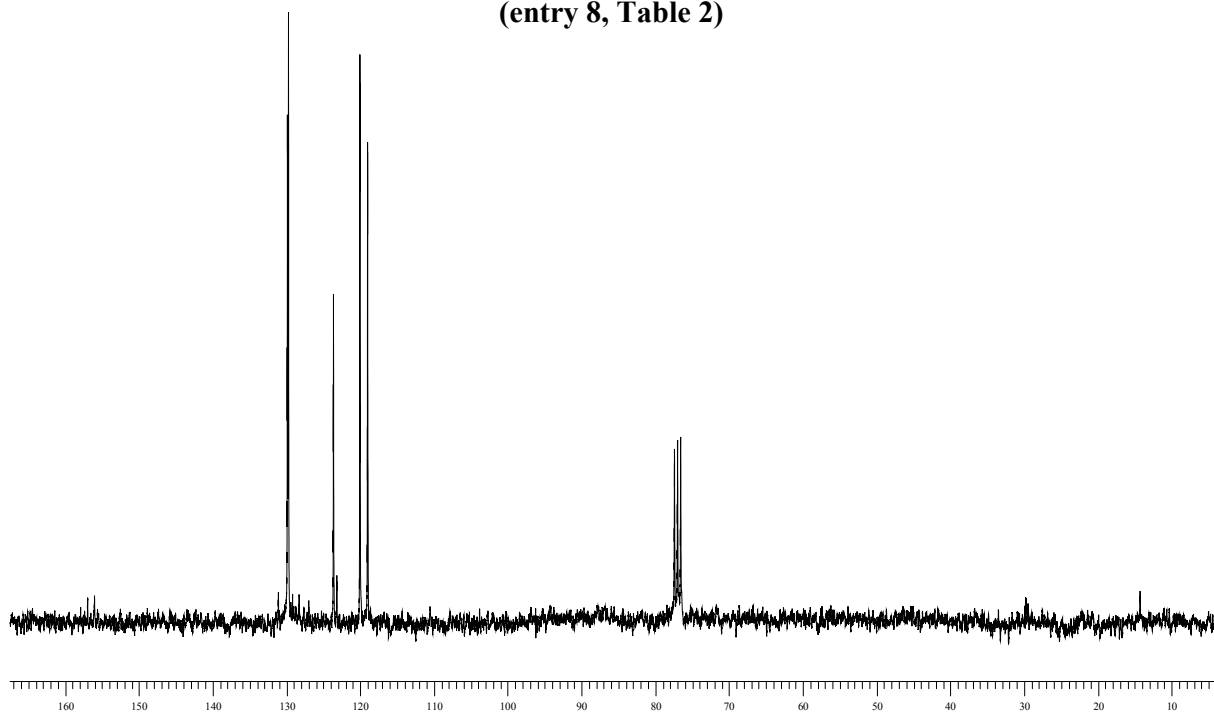
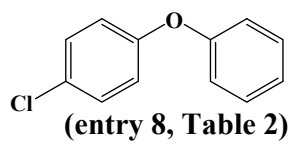


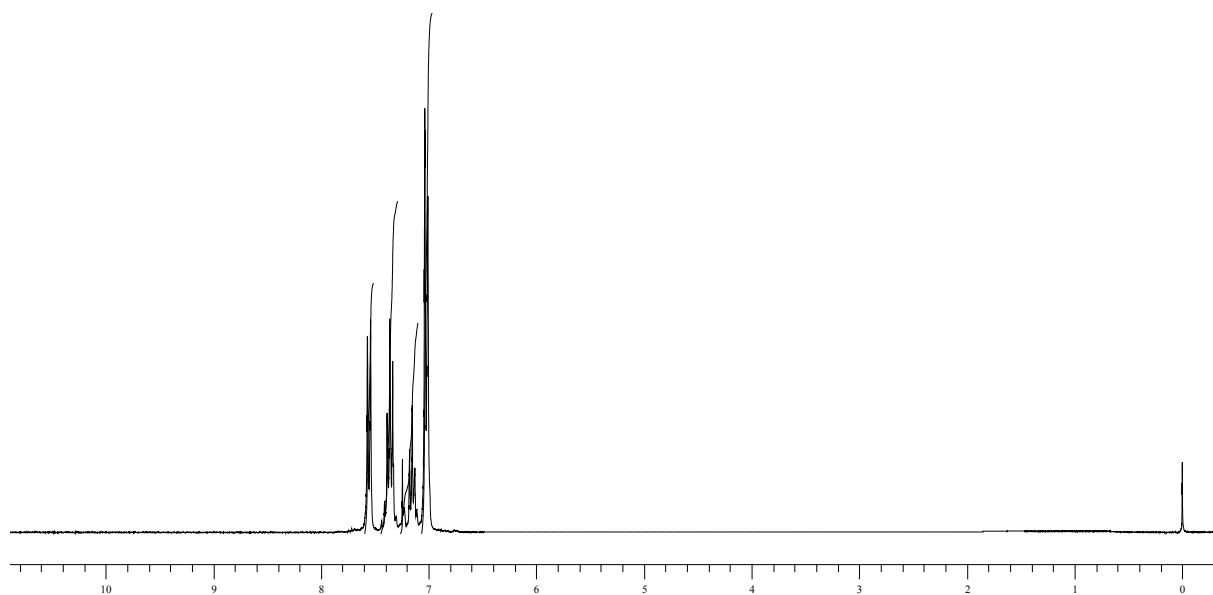
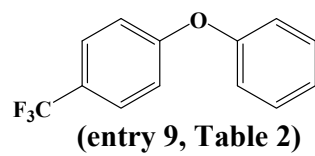


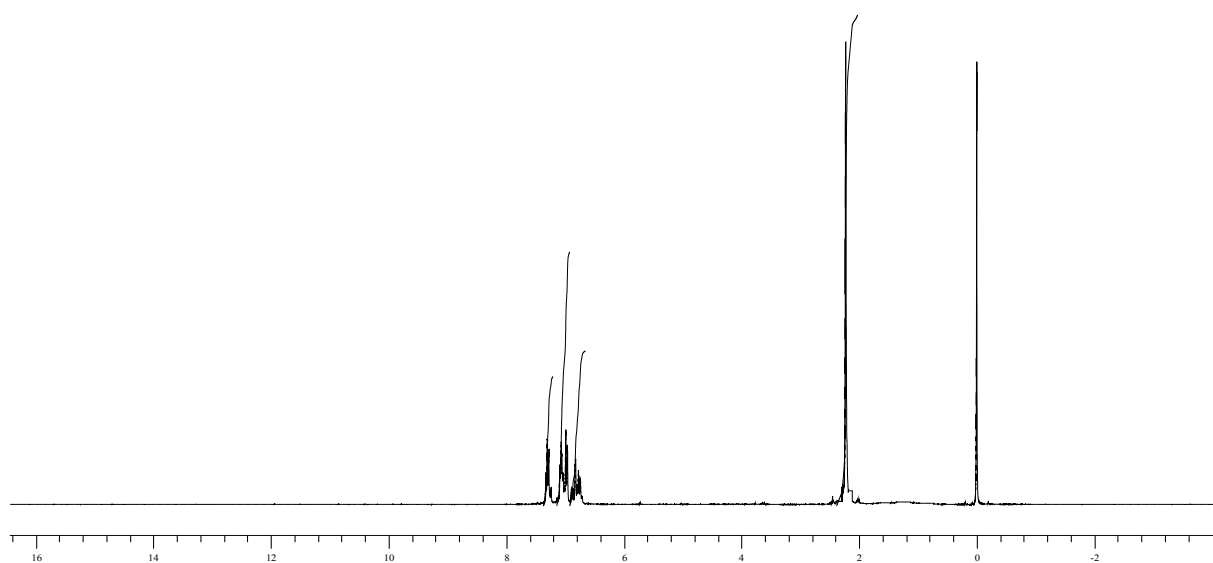
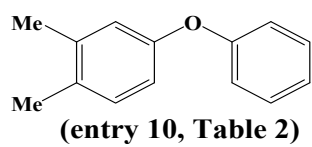
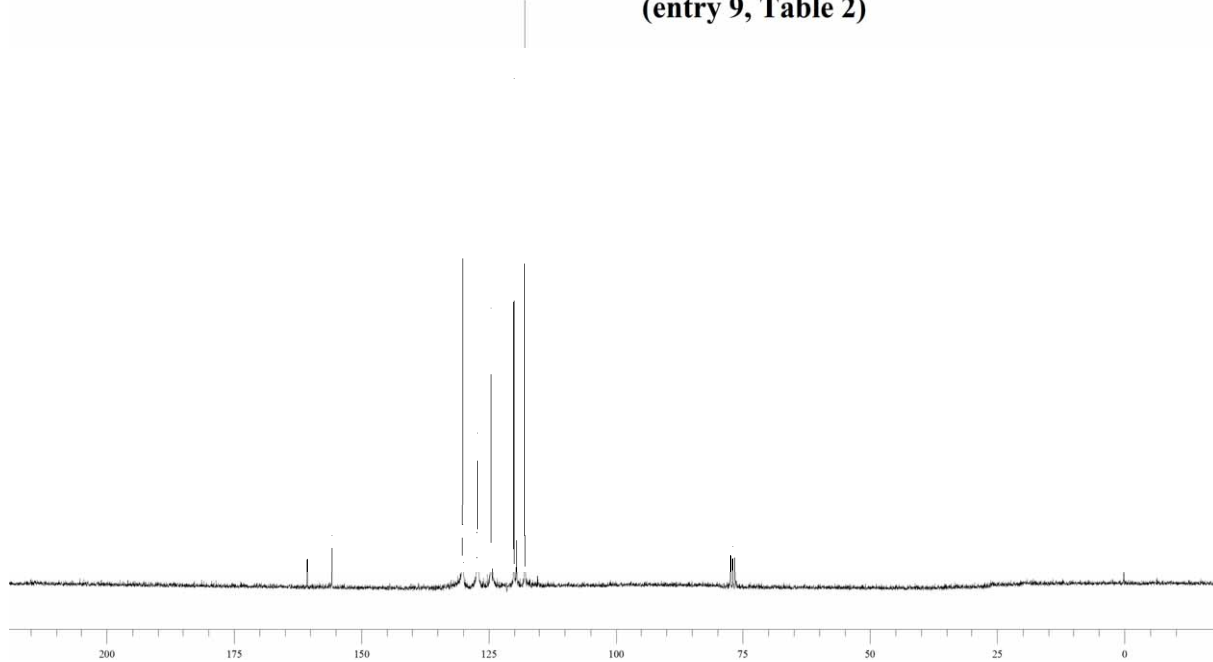
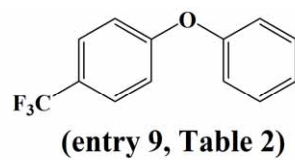


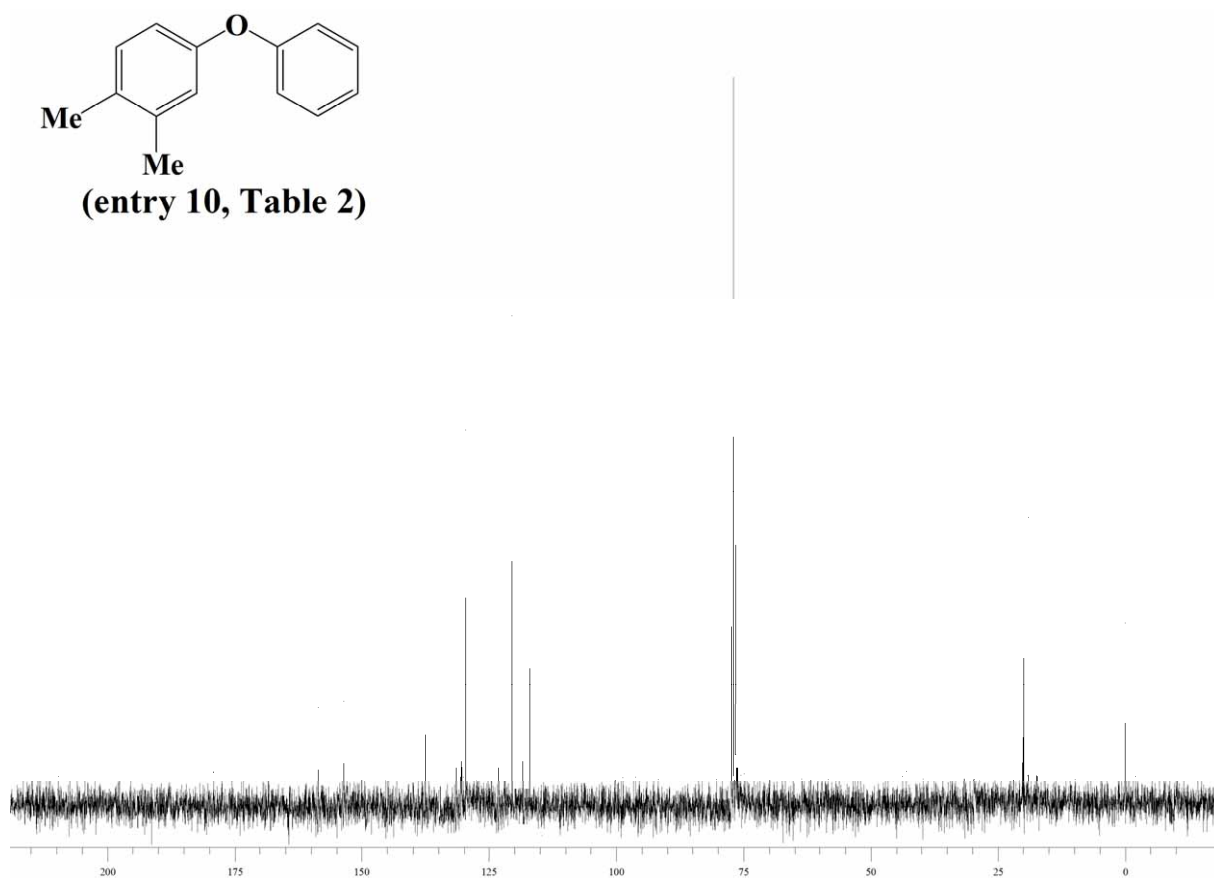


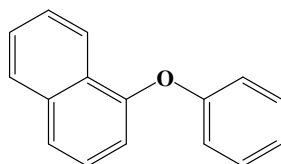




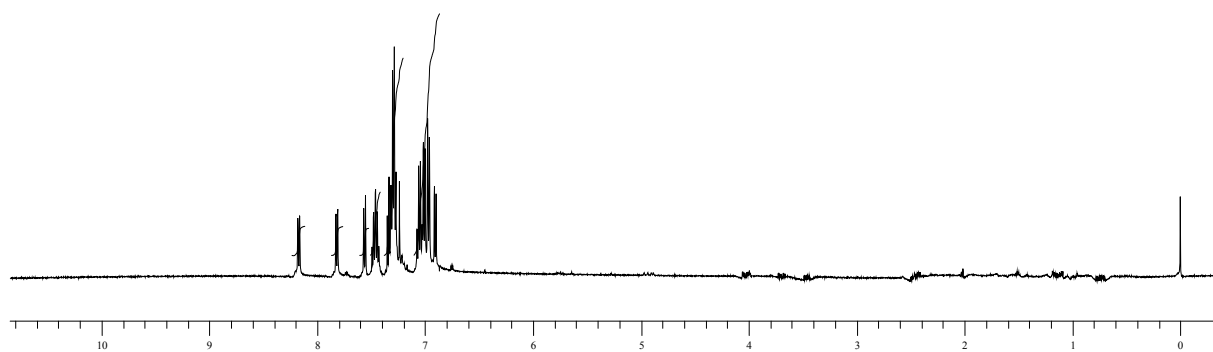




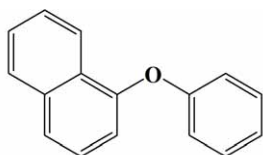




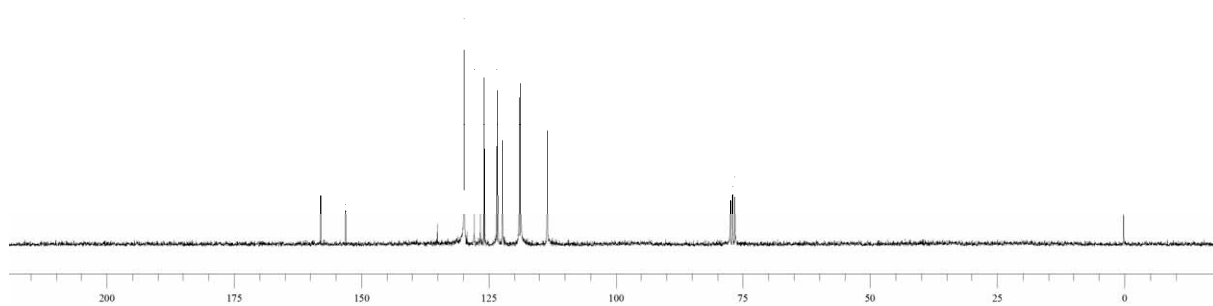
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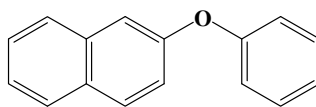




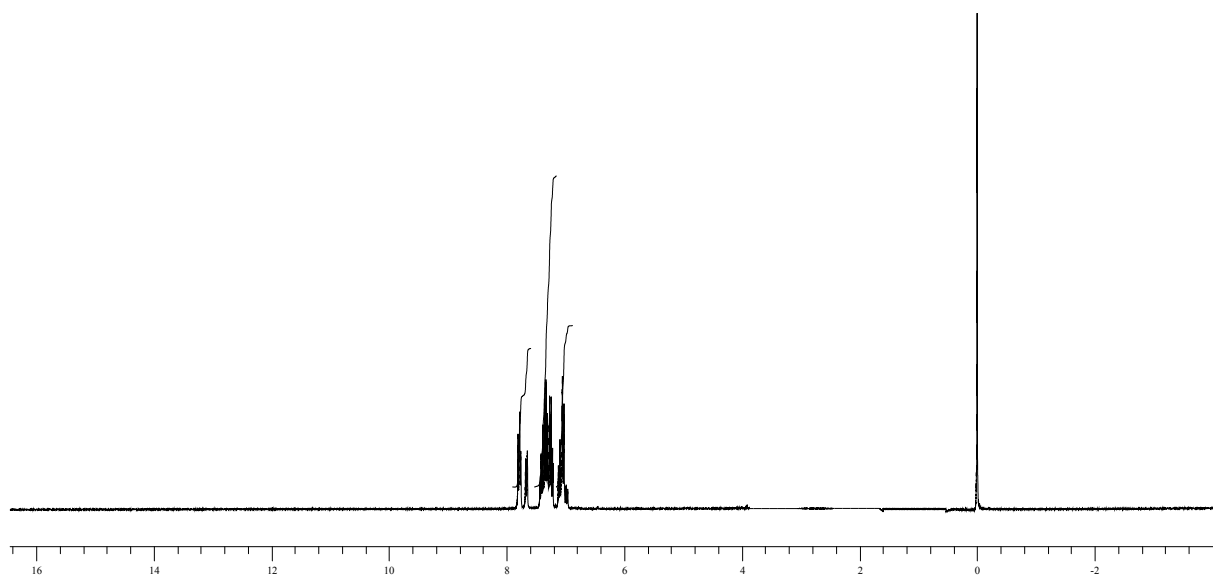


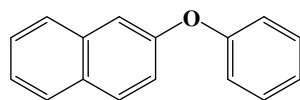
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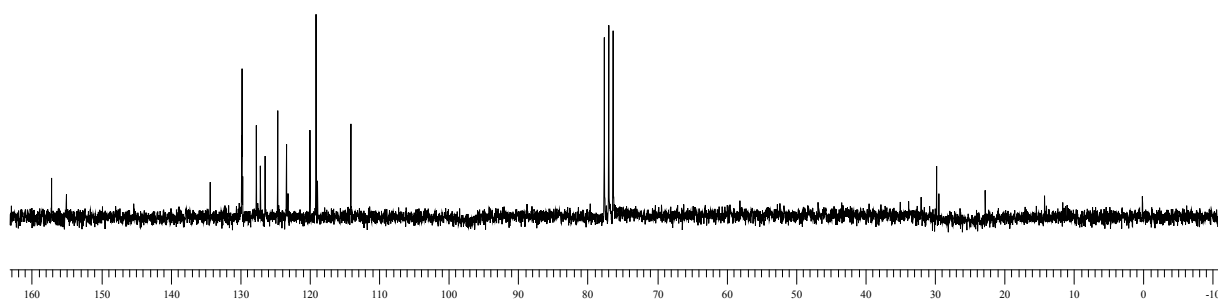


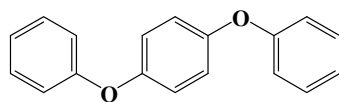
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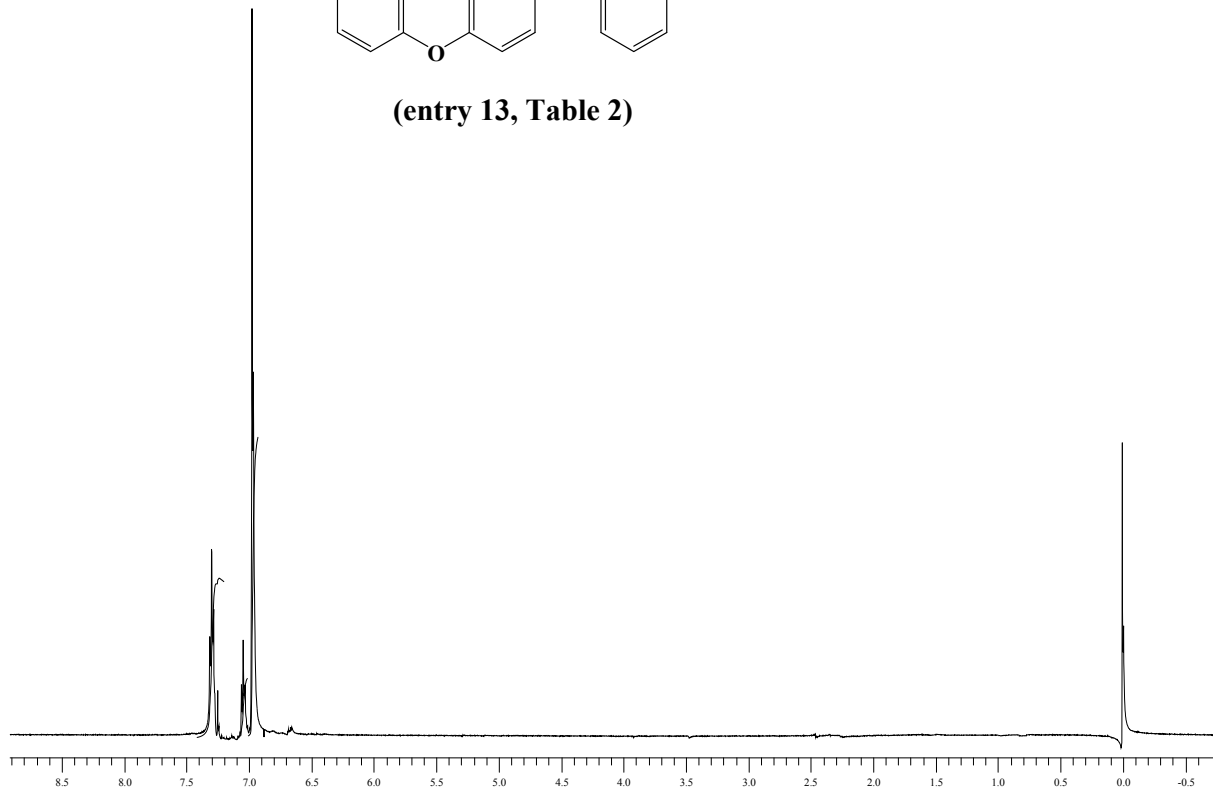


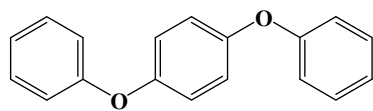
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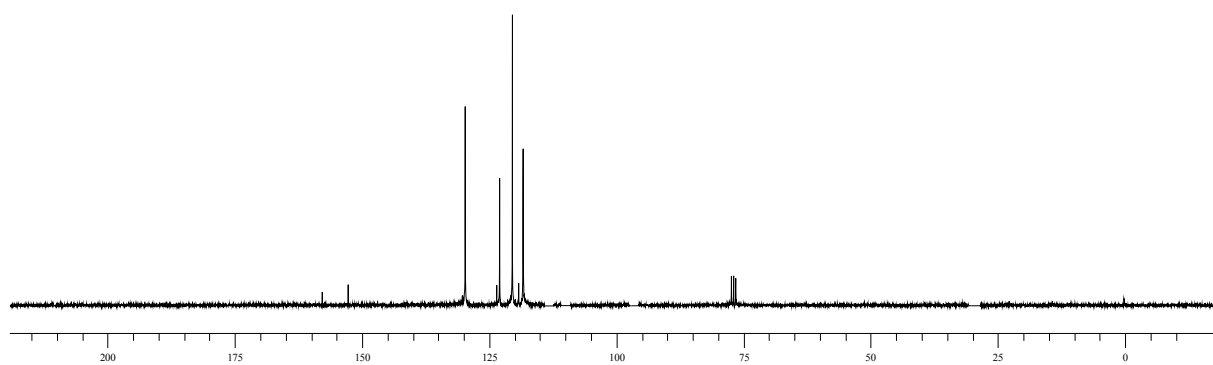


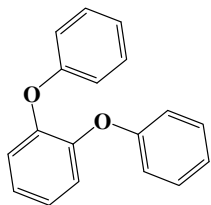
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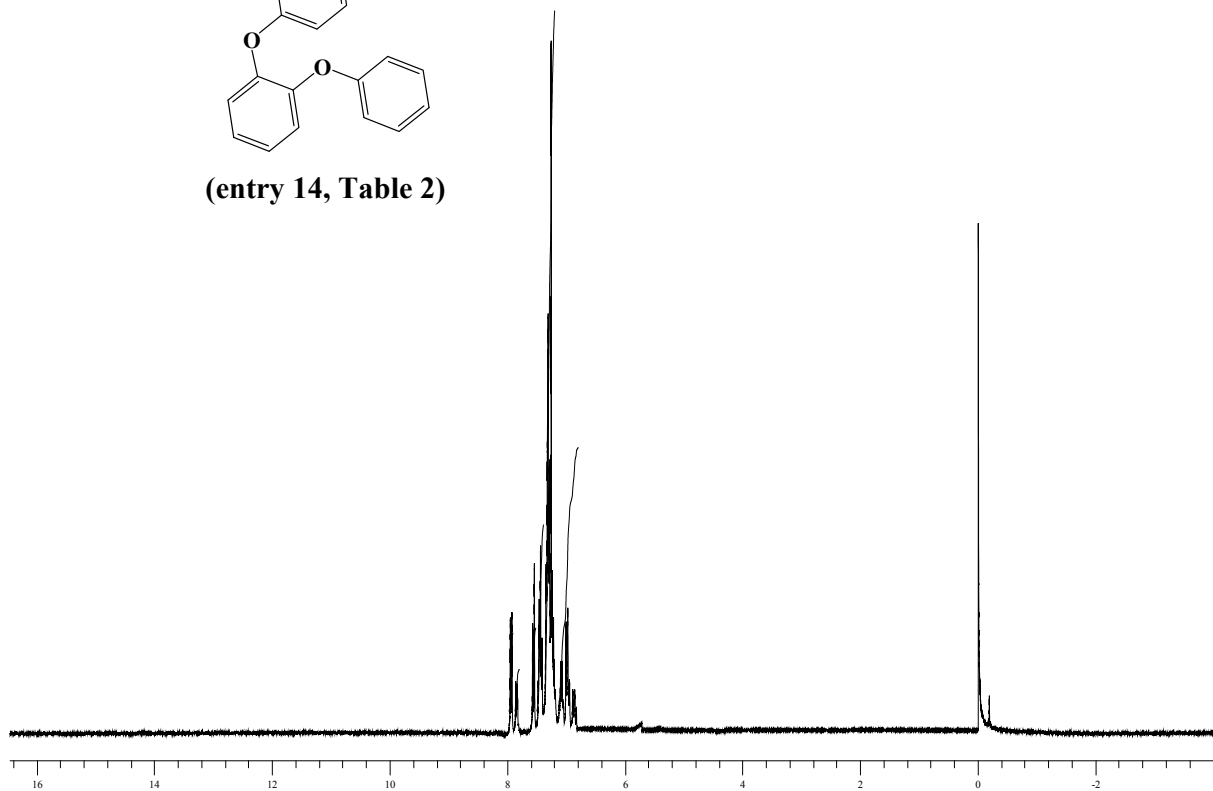


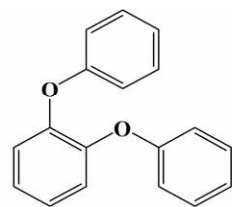
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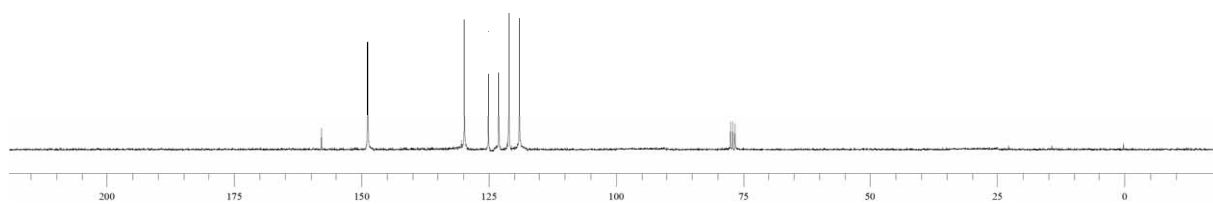


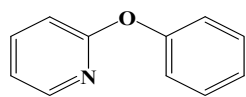
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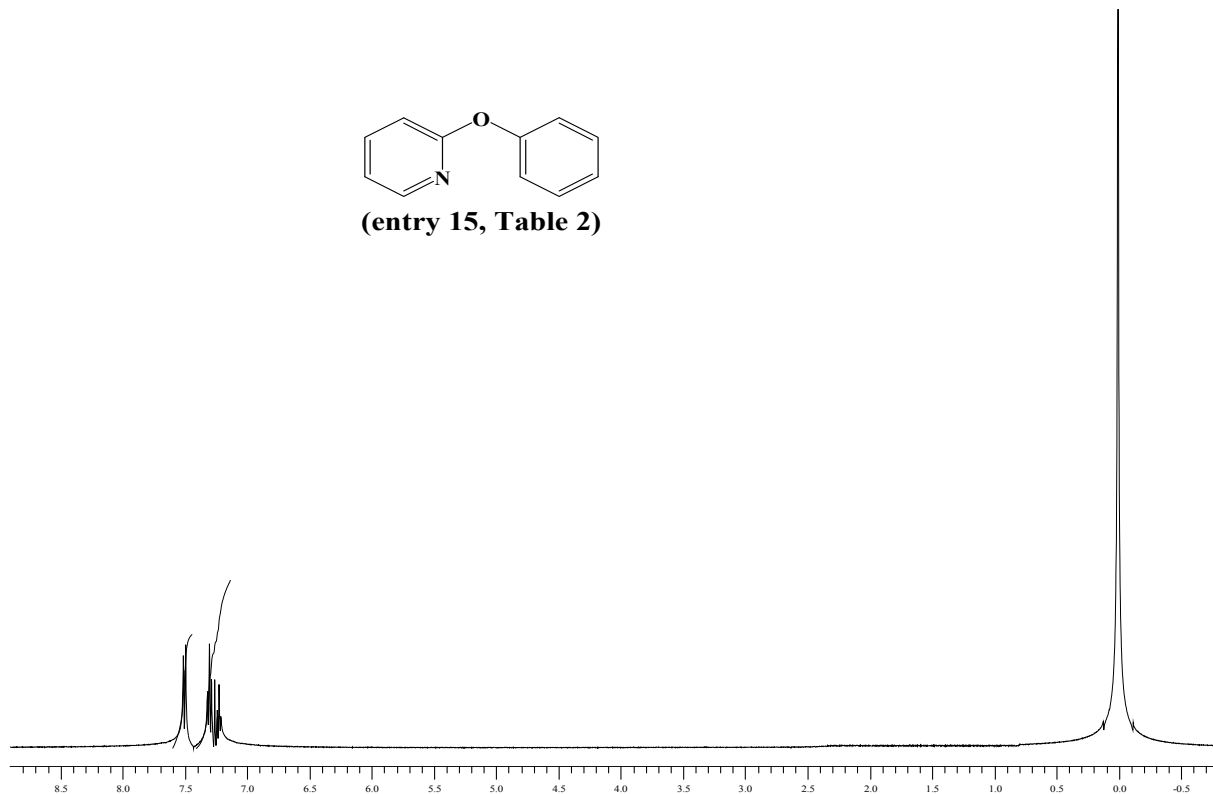


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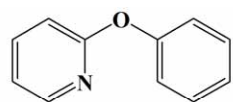




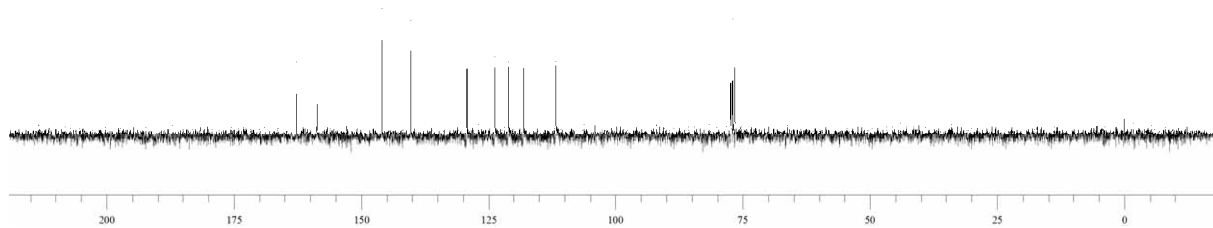
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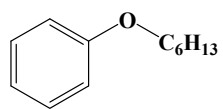




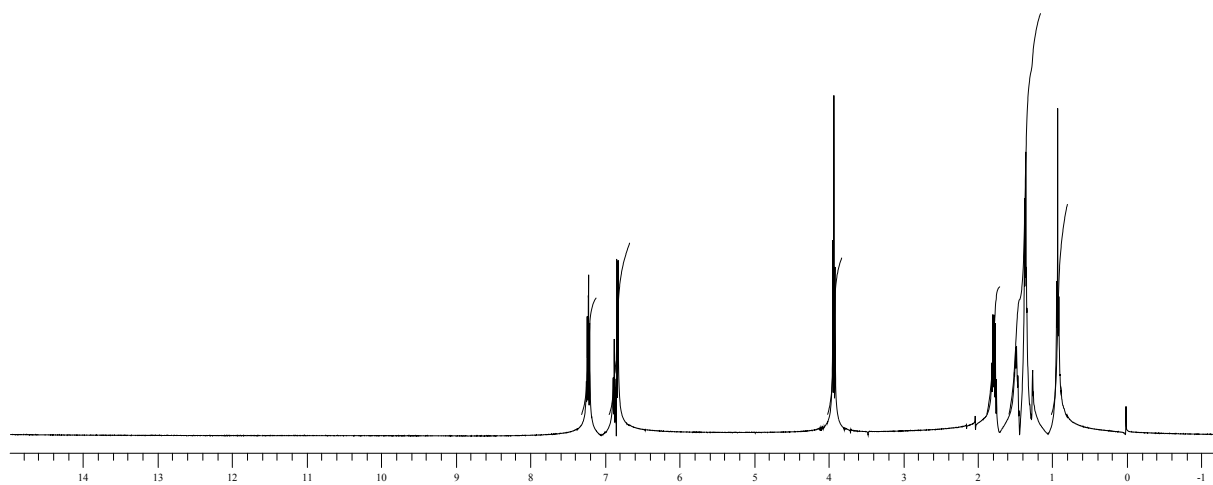


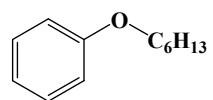
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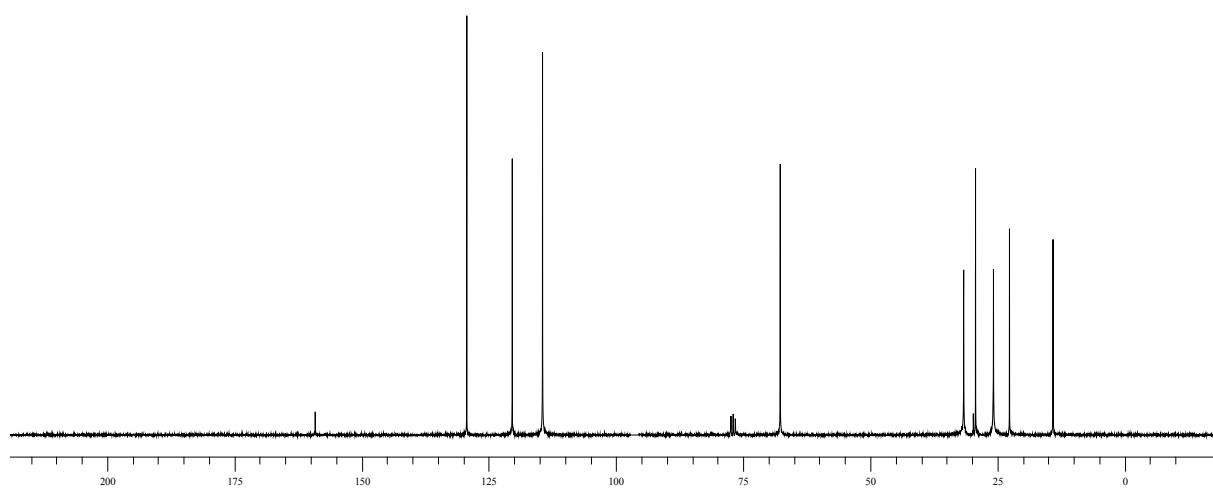


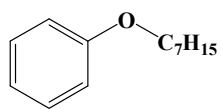
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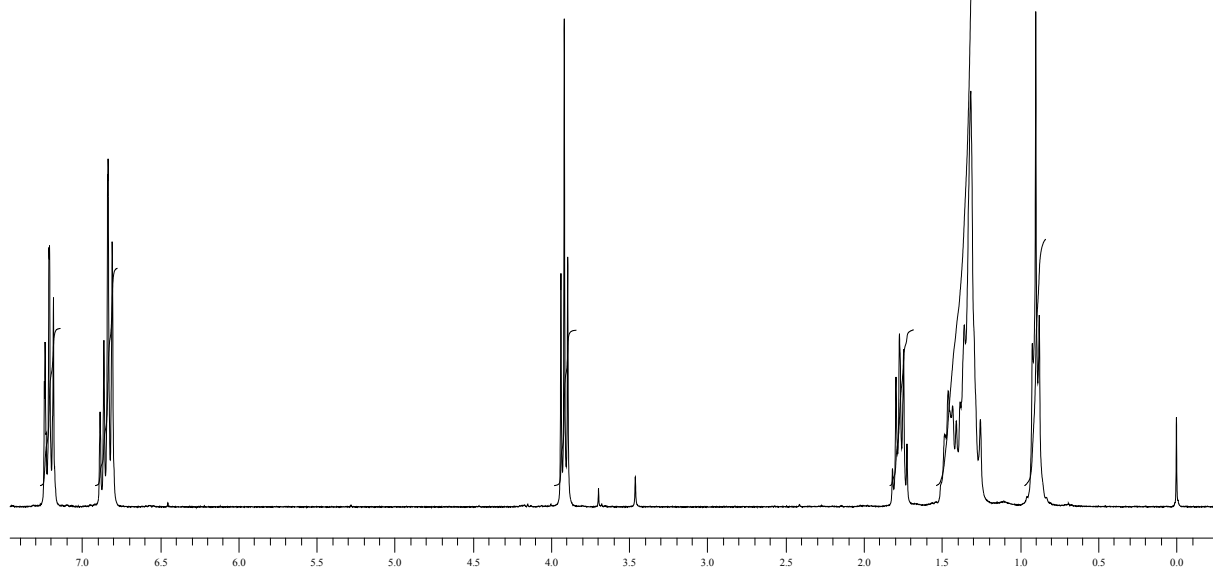


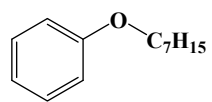
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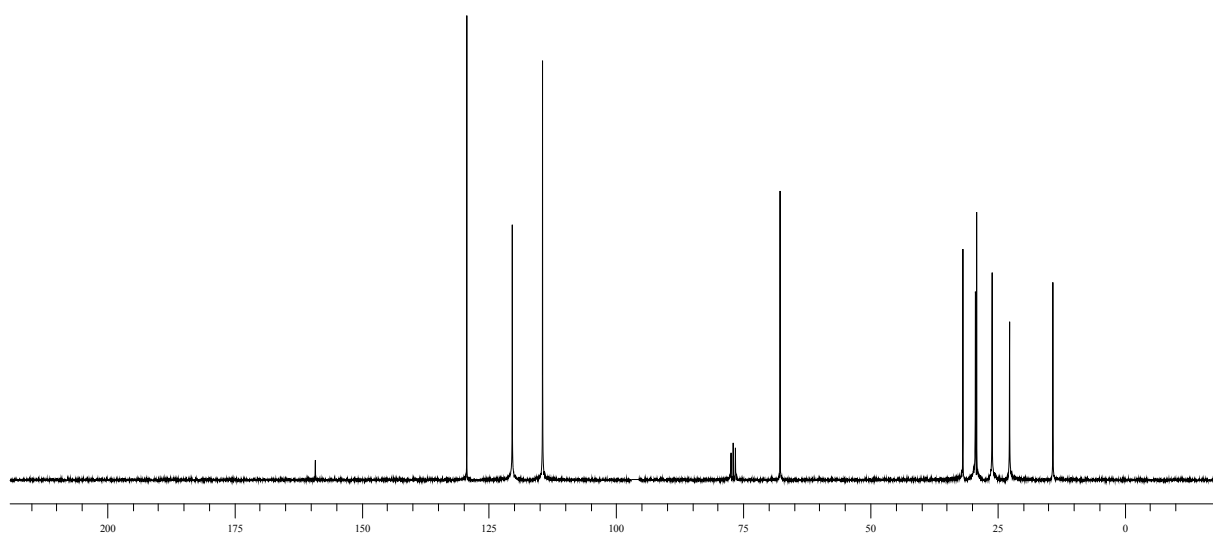


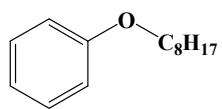
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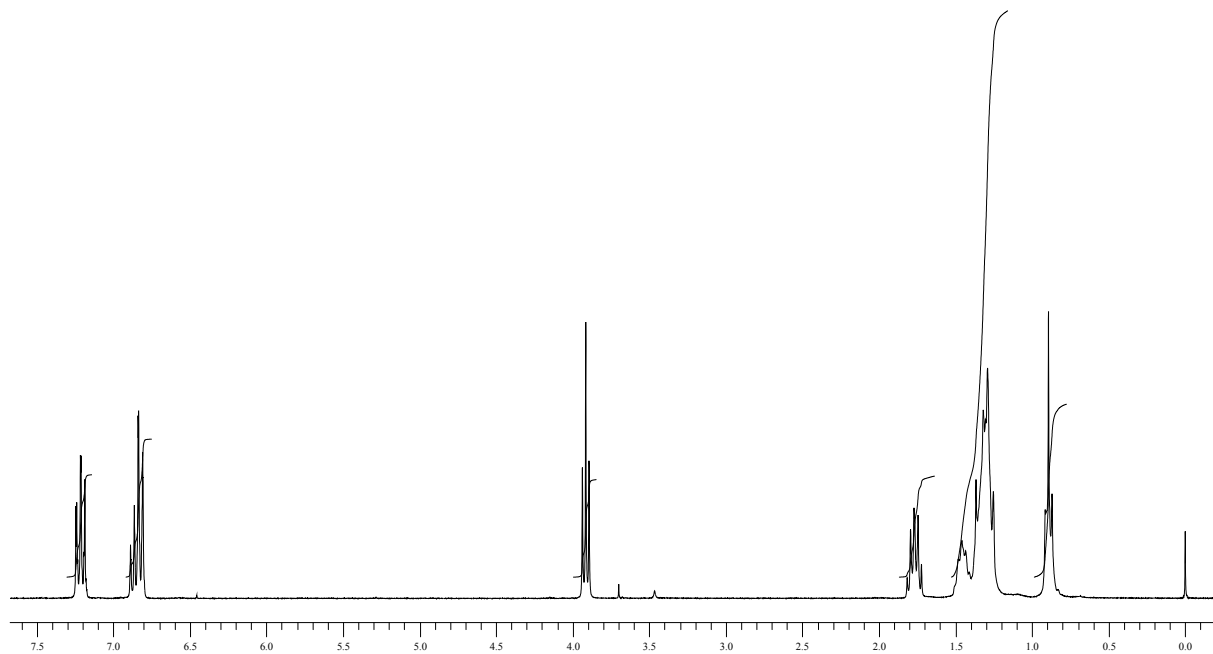


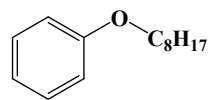
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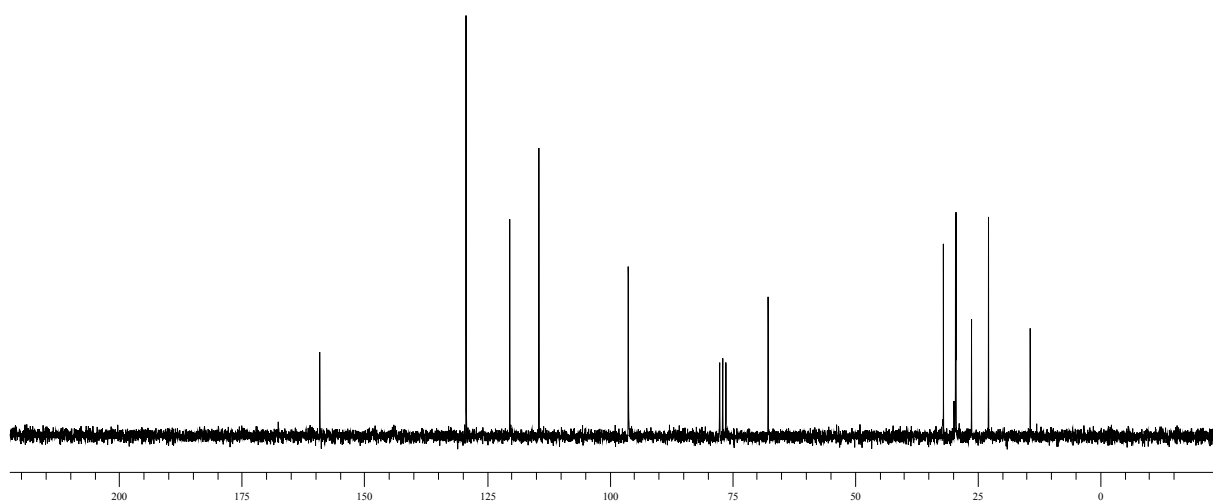


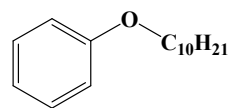
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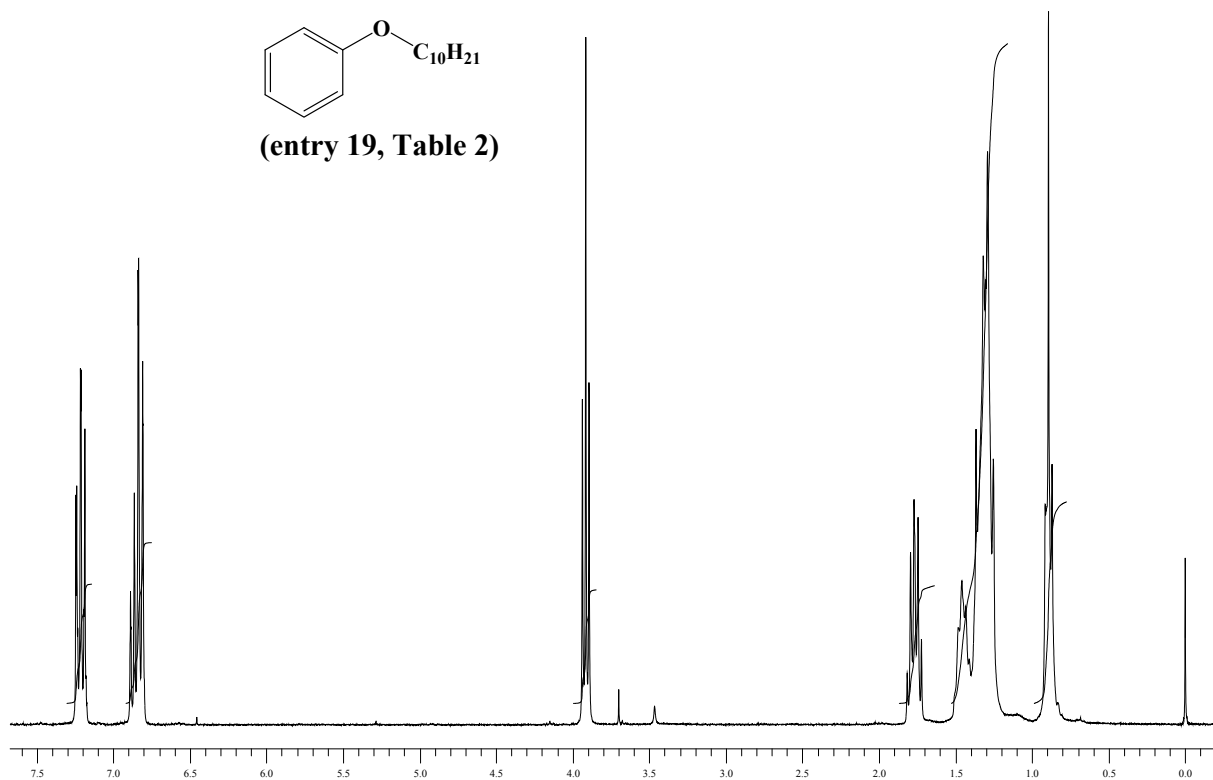


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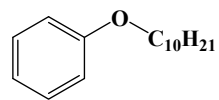




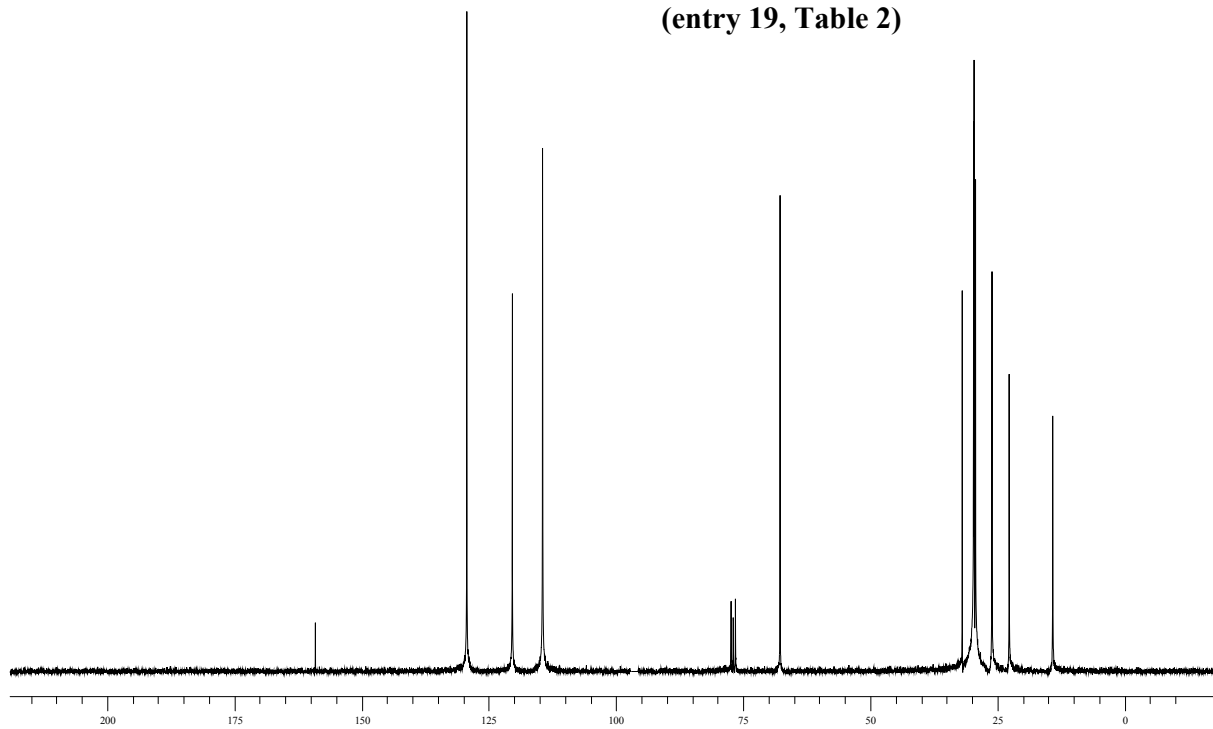
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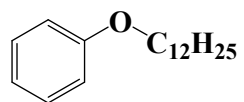




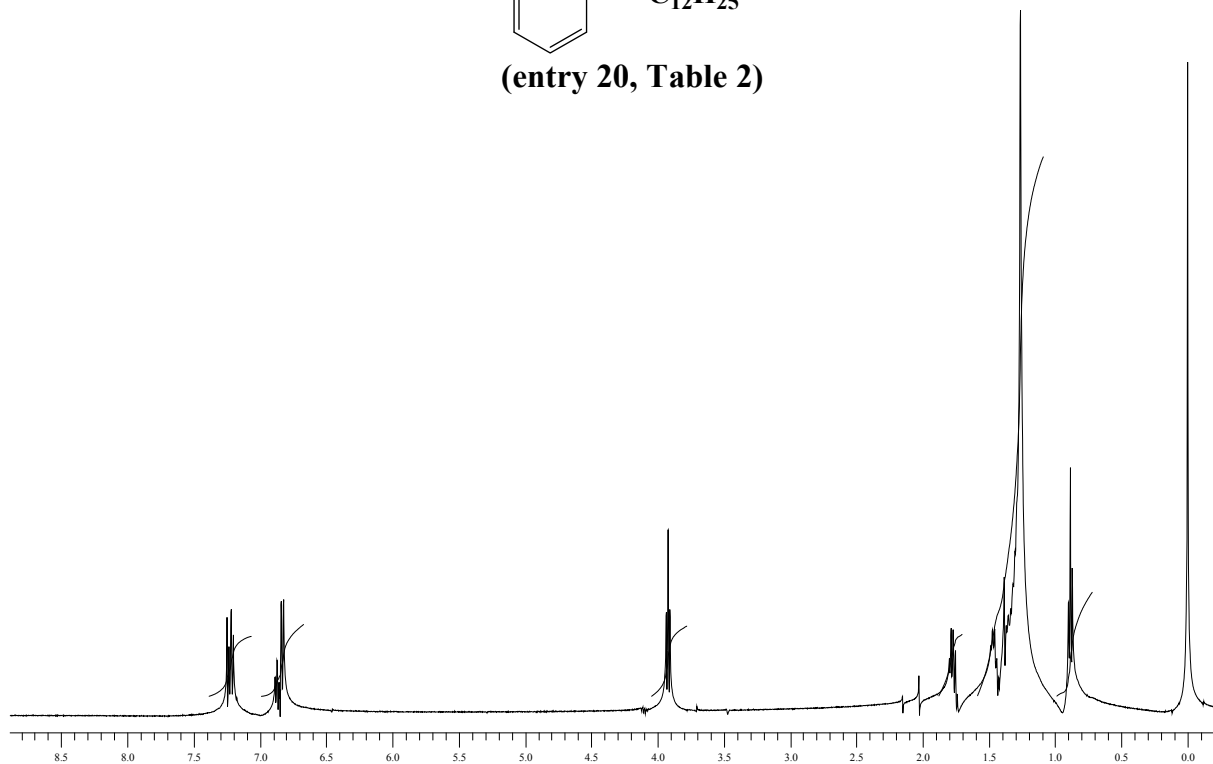


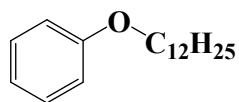
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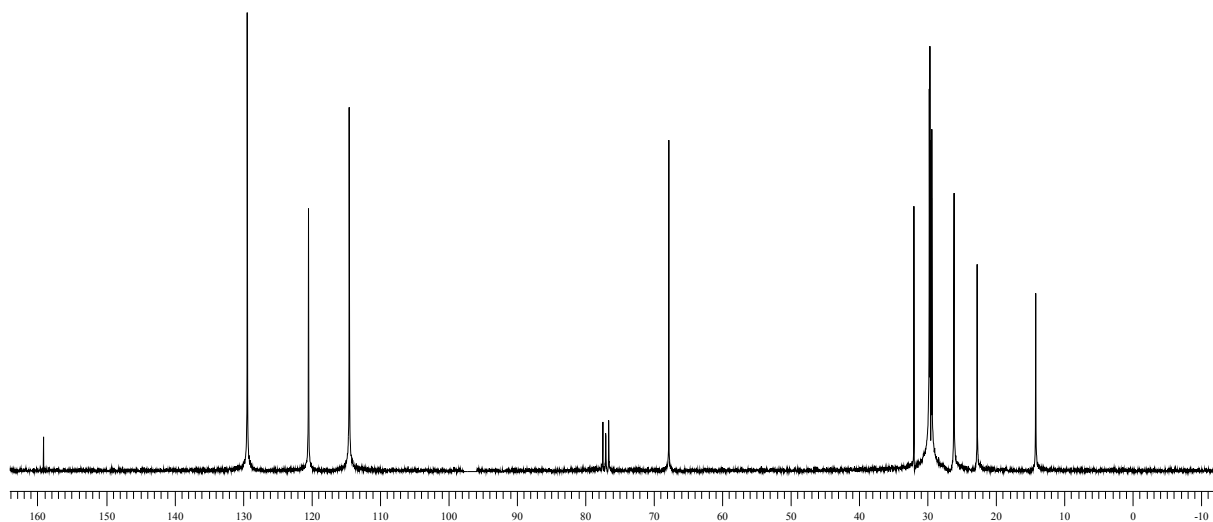


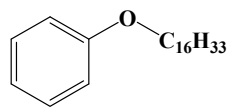
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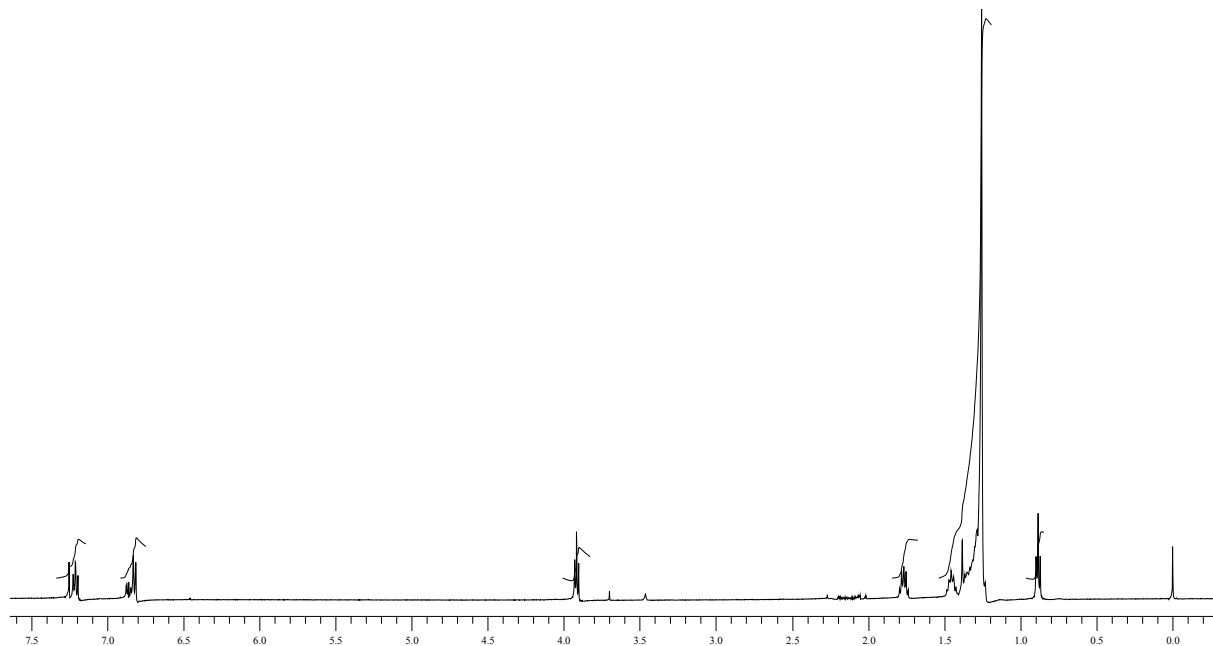


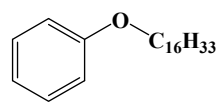
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(entry 21, Table 2)





(entry 21, Table 2)

