

Post-lab for Experiment 1

Name:

Date:

Lab day:

1. Reaction:

2. Amount of eugenol: _____ g _____ mmol

3. Theoretical yield of product: _____ g

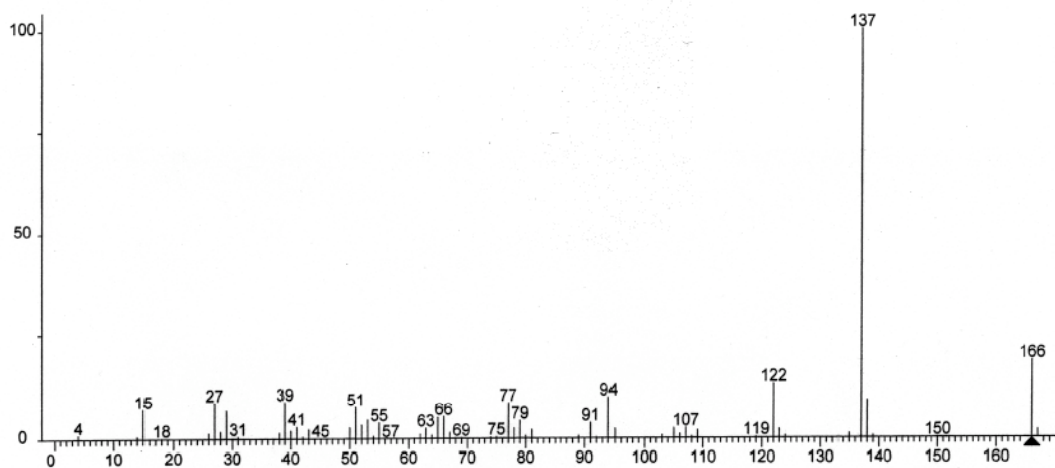
Isolated amount: _____ g, _____ mmol

4. Percent yield of product:

5. Draw the structure of the product, and label the protons. Then, construct a table of the ^1H NMR peaks below it. For each peak, give the chemical shift, integration, multiplicity, and peak assignment. Make sure you assign all peaks in the spectrum (except for CDCl_3 and TMS), including residual solvent or starting material.

6. Draw the structure of the product, and label the carbons. Then, construct a table of the ^{13}C NMR peaks below it. For each peak, give the chemical shift, and peak assignment. Make sure you assign all peaks in the spectrum (except for CDCl_3 and TMS), including residual solvent or starting material.

7. The mass spectrum for the product is shown below. Assign as many peaks as you can.



8. Questions:

In the early days of organic chemistry, hydrogenation was used to help determine the structure of unknown compounds. A hydrogenation was performed, and the volume of hydrogen reacted was measured. In this way, it was possible to determine the number of alkenes or alkynes in a molecule.

You obtain an unknown sample from the dregs of a beer cup and need to figure out the structure. The IR peaks are 3050, 2950, 1650, and 1700 cm^{-1} . The MS tells you that the MF is $\text{C}_9\text{H}_{14}\text{O}$. When 200 mg of the compound is submitted for hydrogenation at room temperature under 1 atm of pressure, 67 mL of H_2 is used up. Propose a structure for the compound.

Attach the ^1H and ^{13}C NMR spectra with the structure of the compound and all peak assignments. Staple the carbon copies of your lab notebook to the lab report.