

Name: \_\_\_\_\_

Locker Number: \_\_\_\_\_

## Experiment 58

### FRIEDEL-CRAFTS ACYLATION

1. Write a balanced chemical equation for the preparation of your Friedel-Crafts acylation product. Show the starting material that you chose, and draw the complete structure of the product formed in your experiment.
2. Report the **grams** of acylation product that you obtained in this experiment.
3. Report the **percentage yield**. Show your calculation. Use the actual yield that you reported in **2**, above.
4. Attach the infrared, proton NMR and  $^{13}\text{C}$  NMR spectra to this report sheet. On a separate page provide a careful discussion of what you learned about your acylation product from each of the spectra. Assign as many peaks as possible for each spectrum and explain all important features, including the NMR splitting patterns. **Remember:** The object of this discussion is to provide a *proof* that your structure is the one that you claim!
5. On a separate sheet, draw the complete mechanism for aromatic substitution (using your starting material) to show why the substitution occurred at the ring position that you observed. Also explain why the acylation occurs only **once** with your starting material.
6. Be sure to submit a sample of your acylation product. Use a properly labeled sample vial.

ANSWER EACH OF THE FOLLOWING QUESTIONS

1. The following are all relatively inexpensive aromatic compounds that could have been used as substrates in this reaction. Predict the product that would be obtained on acylation of each of them, using acetyl chloride.



