Data

Weight of salicylic acid added	
Volume of acetic anhydride	
Density of acetic anhydride	
Molecular Weight of acetic anhydride	
Molecular Weight of salicylic acid	
Theoretical Yield of aspirin	
Actual Yield of crude aspirin	
Actual Yield of recrystallized aspirin	
Percent Yield of recrystallized aspirin	
Melting Point of pure aspirin (literature)	
Melting Point of recrystallized aspirin	
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Discussion Questions:

- 1. Determine the percentage yield of your crude product.
- 2. As in many organic reactions, the synthesis in this experiment is an equilibrium reaction. What steps could you take to improve the yield of aspirin in this particular experiment?

3. If the aspirin crystals were not completely dried before the melting point was determined, what effect would this have on the observed melting point?

4. *(Optional)* Discuss the purity of your final product. How pure (or impure) is your aspirin based on literature values? Comment on how your IR spectrum parallels the spectrum of pure acetylsalicylic acid, making certain to LABEL and discuss all characteristic absorption peaks. You should turn in the labeled IR spectrum of your product with this report.

5. Consider the reaction shown below. Predict the product(s) of this reaction.



Post-Lab Questions: Synthesis and Characterization of Aspirin

1. Determine the theoretical yield of aspirin that can be obtained from the addition of 2.0 grams of salicylic acid and 5.0 mL of acetic anhydride (density = 1.08 g/mL). What is the limiting reagent?

2. Determine the percentage yield of the reaction if 1.9 g of aspirin is obtained in this experiment.

3. What is the purpose of recrystallization?

4. Draw and name two different structural isomers for esters (RCOOR) with an empirical formula $C_3H_6O_2$.