

## Laboratory Report

Mass of Salicylic Acid	
Mass of Filter Paper and Watch Glass	
Mass of Watch Glass, Filter Paper, and	
Aspirin Product	

Properties of Aspirin		Salicylic Acid	Aspirin Product	Aspirin Tablet
Melting Point				
Fe <sup>3+</sup> Observations (Color of solution)				
Thin Layer Chromatography	Spot distance			
	Solvent front distance			
	$R_{\rm f}$ value (calculated)			

- 1. Calculate the number of moles of salicylic acid used in this experiment.
- 2. Calculate the maximum amount of acetylsalicylic acid in grams that may be obtained from this amount of salicylic acid. This is the theoretical yield. **Hint:** See *Pre-Laboratory Questions* 3–5.
- 3. Determine the mass of aspirin obtained in this experiment and calculate the percent yield.
- 4. Iron(III) ions are used as a qualitative test for phenols (aromatic compounds containing an –OH functional group). (a) What compound was used as a positive control for the Fe<sup>3+</sup> test in this experiment? (b) Did the reaction product give a positive or negative test result with Fe<sup>3+</sup> ions? Explain.

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5. Old aspirin tablets often have a faint vinegar (acetic acid) smell and give a positive test with iron(III) ions. Write a balanced chemical equation for the **hydrolysis** of aspirin (reaction of aspirin with water) to explain these observations.

6. Acetic anhydride was used in excess in this experiment. What does this mean, and how was the excess acetic anhydride decomposed at the end of the reaction?

7. Look up the melting points of salicylic acid and aspirin (acetylsalicylic acid) in a reference book or online and compare with the melting point of the reaction product.

8. Describe the results of TLC analysis of the aspirin product obtained in this experiment. Compare the purity and  $R_{\rm f}$  values of the product against commercial aspirin and the starting material.