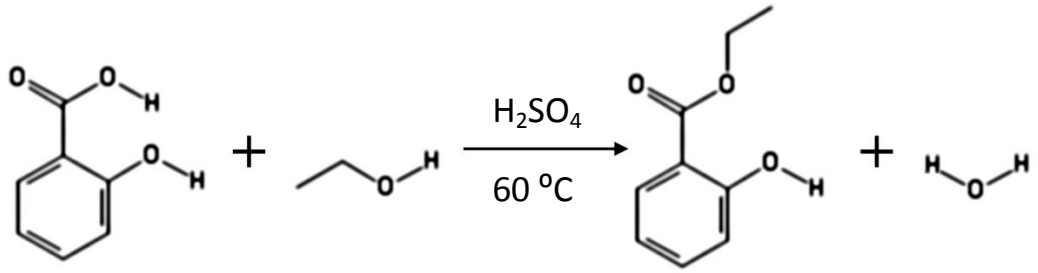
Lab: Synthesis of Ethyl Salicylate from Salicylic Acid

Name_____Lab Group Name_____

Part I: Reaction Setup



	$C_7H_6O_3$	C_2H_5OH	$C_9H_{10}O_3$	H_2O
Grams:	_____	_excess_	_____	_____
Molar Mass:	_____	__N/A__	_____	_____
Moles:	_____	_excess_	_____	_____

Obtain a sample of salicylic acid ($C_7H_6O_3$). Measure the mass by use of a tared weighing boat:

_____ - _____ = _____ grams

We have a 4M solution of H_2SO_4 (sulfuric acid) in C_2H_5OH (ethyl alcohol). This is a highly corrosive, irritating, and flammable mixture. Wear gloves and goggles and immediately rinse off under cold running water if contacted.

With your instructor's assistance, place your salicylic acid sample in a flask and add 15 mL of the H_2SO_4/C_2H_5OH mixture. Be sure to label it with the name of your group. It will be stoppered or corked, and then heated in a water bath at 60 C for 2 hours to complete the reaction.

Homework: Complete the reaction table above, in order to calculate the theoretical yield of ethyl salicylate ($C_9H_{10}O_3$) and water (H_2O) from this reaction.

Part II: Reaction Workup

Optional: With your instructor's assistance, evaporate as much of the ethyl alcohol solvent as you can under a gentle stream of compressed air. This is a dangerous operation as the solvent contains sulfuric acid! You do not want to risk spraying it around.

Add concentrated aqueous sodium carbonate (Na_2CO_3) to your reaction, slowly, with a dropper. Each addition will fizz as it neutralizes sulfuric acid. Swirl after each addition until the fizzing stops. Continue until you no longer see fizzing with each addition.

Your reaction should appear cloudy at this point. Transfer it into a large test tube, or two if absolutely necessary, and allow it to settle. The ethyl salicylate ($C_9H_{10}O_3$) is a liquid, heavier than water, which should settle at the bottom of the test tube.

Obtain a vial and measure the empty mass _____

Carefully pipet the ethyl salicylate from the bottom of the test tube into the vial. Weigh the vial again _____

Subtract to obtain actual yield of ethyl salicylate ($C_9H_{10}O_3$)_____

Using your theoretical yield from the first page, calculate %yield _____

Esters are commonly used in artificial scents and flavors. Carefully waft the vapors from your ethyl salicylate sample. What does it smell like?

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