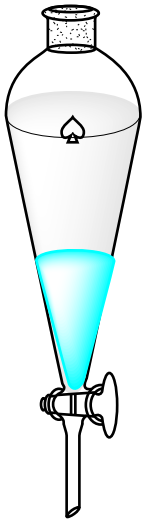
CHM2123 – Problem Set #1

1. In a beaker, you have a solution containing 50 mL ethyl ether, 3.1 g 4-amino acetophenone and 2.5 g 4-methylbenzyl alcohol. You are asked to add 50 mL H_2O to the beaker, along with five drops of concentrated HCl, and then to transfer the mixture to a 125 mL extraction funnel. Two phases appear in the extraction funnel. Indicate the contents of phase A and phase B *after* shaking. (**2 points**)

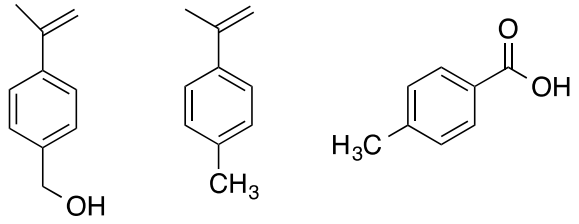


Phase A

Phase B

2. Why is Na_2CO_3 added to the tea mixture in step 5 of part A of this experiment? Justify your answer with a chemical equation. (**2 points**)

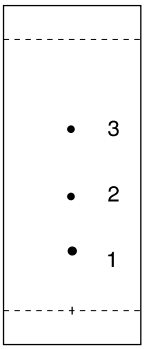
3. A dilute solution containing the following molecules is spotted onto a TLC plate. (**2 points**)



A **B** **C**

The plate was eluted with a mobile phase composed of 6:4 hexanes : ethyl acetate.

a) Calculate the R_f value for each spot.
b) Assign each compound to its corresponding spot onto the plate, and justify your reasoning.



4. Do you hypothesize that violaxanthin, a carotenoid found in spinach, would have a smaller or larger R_f value relative to that of chlorophyll *a*? Explain your reasoning. (**2 points**)

5. a) When recrystallizing a compound from a crude product, explain why it is necessary to allow a mixture to cool to room temperature prior to placing it on ice. (**1 point**)

   b) After having dissolved the crude product in 10 mL ethanol, and following step 17 of Part A, you do not observe crystal formation in your beaker after 15 minutes. Provide an explanation. (**1 point**)

   c) What will you do to solve the problem? (**1 point**)