

Chem 226/ Fall 2008

Dr. Rusay

Demonstration Observations & Experiment #1 Prelab Questions

Extraction & Separation

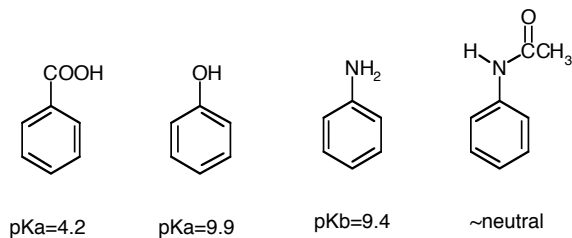
Read and refer to handout: <http://chemconnections.org/organic/chem226/Labs/extraction-08.html>

Answer the following 4 questions, check the appropriate boxes on the *Lab Skills & Operations* check list form, provide a brief pre-lab report in your lab notebook (particularly a Data Table for the chemicals that are to be used in your experiment plus a flow chart for the separation scheme), bring everything to Dr. R. who will initial the pages. *(This page, after being initialed, is to be attached to your lab notebook pages and turned in as part of your final report.)*

1. Describe the colors of the two liquid phases before mixing, and before and after each extraction. Draw a picture of the separatory funnel labeling the aqueous and dichloromethane layers. Describe the color differences between the first and second extractions and how they relate to the concentration of iodine in the layers.
2. An analgesic sample thought to contain 500 mg of acetanilide was dissolved in 100 mL of water to remove all of the sugar binder. The entire amount of acetanilide was to be recovered through an ether extraction. One student, *Hydie*, used 50 mL of ether and extracted the water layer one time. A second student, *Ethyl*, also used 50 mL of ether but divided it in half and extracted twice (2x 25 mL). Would the results be the same or not? If not, which student had the better procedure. The partition coefficient for acetanilide in ether versus water is $K = 10.3$; briefly explain your answer.

3. Before beginning the lab develop a plan to separate the following four compounds.

Provide a separation scheme starting with a mixture containing 1.0 gram of each of the following compounds. Draw a test tube showing two layers next to each step. Indicate which layer is which (eg. ether top, water bottom) and the respective chemical structures for what is in each layer. Use any of the following reagents and solvents: NaOH (aq), HCl (aq), CH_2Cl_2 , $\text{CH}_3\text{CH}_2\text{OCH}_3$, Na_2CO_3 (aq), and NaHCO_3 (aq). You do not need to indicate the amounts of each.



4. Benzoic acid is in the scheme and in the experiment, chloroaniline behaves as aniline does. Which of the remaining structures has solubility properties similar to dibromobenzene?