Chem 141 Problem Set 3
Friday 26th September 2008

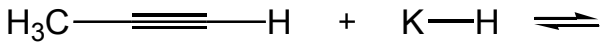
This problem set covers material to the end of Chapter 2 in McMurry.

1a. Write acid dissociation reactions of the form HA $\rightleftharpoons$ $H^+ + A^-$ for CH_3CH_2OH (ethanol) and for $(CH_3)_3NH^+$ (trimethylammonium ion)

b. Draw curved arrows to show the chemical reaction and predict the products for the reaction of ethanol with trimethylamine $(CH_3)_3N$:

c. If the pKa of ethanol is 15, and the pKa of trimethylammonium ion is 11, which side of the reaction is favored and by how much?

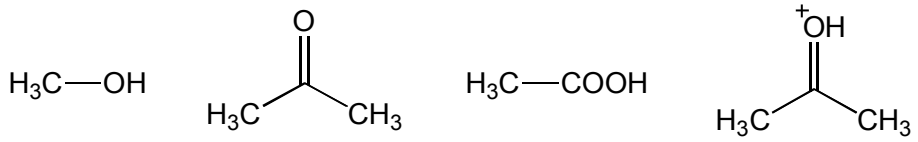
2a. Use curved arrows to predict the products of the following reaction:



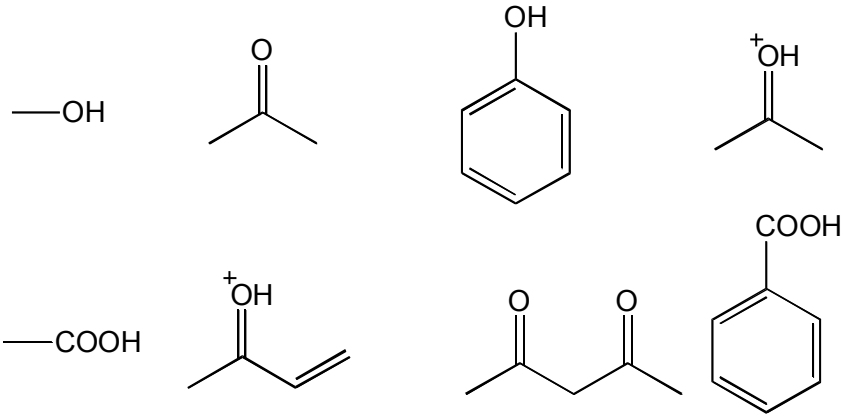
propyne potassium hydride

b. The pKa's for propyne and hydrogen are 25 and 35 respectively. Predict the favored products of the reaction (i) in hexane, and (ii) in water.

3. Rank the following acids strongest to weakest

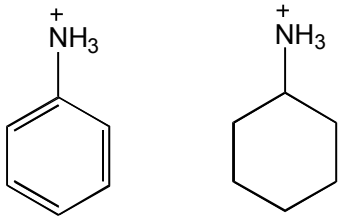


4. Rank the following acids strongest to weakest



5. Which of the acids in Q. 4 will react with sodium hydrogen carbonate, $NaHCO_3$? The pKa of carbonic acid, H_2CO_3, is 6.4.

6. Consider these conjugate acids and their pKa's:



5.2 10.5

Which is the stronger base, $C_6H_5NH_2$, or $C_6H_{11}NH_2$, and why?