PRACTICE PROBLEMS (general equilibria and acid/base equilibria)
Chem II

Weak Acids and Strong Acids Problems,

1. Calculate the [H+] and [OH]] in a 0.010 M solution of HCN.

2. A solution is made by dissolving 18.4 g of HNO_3 in enough water to make a 662 mL of solution. Calculate the pH of the solution.

3. The K_A of chloroacetic acid ($ClCH_2COOH$) is 1.36×10^{-3} . Calculate the pH, the pOH, the [H+], and the [OH-] of a 1.00 M solution of chloroacetic acid. (Hint: take the H+ off the end of this ORGANIC acid in the dissociation rxn)

4. Calculate the K_A of a 0.060 M weak monoprotic acid with a pH of 3.44.

5. Calculate the pH of a 7.0×10^{-2} M HCl solution.

6. Calculate the pH of a 2.8×10^{-5} M HNO_3 solution.

7. If 0.10 mol of HCl is added to enough water to produce 1.0 L of solution, calculate the concentrations of H+ and OH- and the pH of the solution.

A few general equilibrium questions and LeChatelier's,

8. When a reaction has reached equilibrium: A) the molecules are in a passive state, therefore no more prodcuts are formed, B) the products are reacting, while the reactants are passive, C) the reactants are reacting, while the products are passive, D) both reactants and products are formed continuously.
9. Which of the following changes will change the position of equilibrium? A) allow more time to pass, B) remove some products, C) add a catalyst, D) temperature of the system changes, E) two of these

10. What effect on equilibrium will there be when the partial pressure of ammonia is increased? Why?
NH_4Cl (s) -----→ NH_3 (g) + HCl(g)

11. The reaction of nitrogen gas with HCl is:
N_2 (g) + 6HCl (g)----→ $2NH_3$ (g) + 3 Cl_2 (g) $\Delta H = +461$ KJ (endothermic)

Predict the effect of each of the following changes to the system on the direction of equilibrium:

A) triple the volume of the system
B) the amount of nitrogen is doubled
C) heat is added to the system