Introduction to Natural Science, Fall 2006
Chemistry Workshop – Week 8

1. Assign oxidation states for all atoms in each of the following compounds.
    - $KMnO_4$
    - NiO_2
    - $Na_4Fe(OH)_6$
    - P_4O_6
    - $XeOF_4$
    - $C_6H_{12}O_6$
    - NO_3^-
    - NH_4^+

2. Specify which of the following are redox reactions and determine the oxidizing agent and the reducing agent.

    - $Cu(s) + 2\,Ag^+\,(aq) \rightarrow 2\,Ag\,(s) + Cu^{2+}\,(aq)$

    - $HCl(g) + NH_3\,(g) \rightarrow NH_4Cl(s)$

    - $SiCl_4(l) + 2\,H_2O\,(l) \rightarrow 4\,HCl(aq) + SiO_2(s)$

3. Calculate the molarity of each of the following solutions.

    - A 5.623 g sample of $NaHCO_3$ is dissolved in enough water to make a 250.00 mL solution.
    - A 184.56 mg sample of $K_2Cr_2O_7$ is dissolved in enough water to make a 500.00 mL solution.

4. Calculate the concentration of all ions present in the following solutions.

    - 0.124 mol of $Ca(NO_3)_2$ in 100.00 mL of solution
    - 5.34 g of NH_4Cl in 450.00 mL of solution

5. What mass of NaOH is contained in 250.00 mL of 0.400 M sodium hydroxide solution?

6. How would you prepare 2.00 L of 0.250 M KOH starting from solid KOH?

7. How would you prepare 250.00 mL of 0.700 M NaOH starting from 2.00 M NaOH solution?