Due: Wednesday, 7-March-2007. Remember this is to be your own work.

1) A 2.750 g sample of a mixture of sodium carbonate and sodium chloride is dissolved in 25.00 mL of 0.879 M HBr. Some acid remains after the treatment of the sample.
   a) Write the net ionic equation for the complete reaction of sodium carbonate with hydrobromic acid.
   b) If 27.8 mL of 0.108 M NaOH were required to titrate the excess hydrobromic acid, how many moles of sodium carbonate were present in the original sample?
   c) What is the percent composition of the original sample?

2) Pure liquid ammonia ionizes in a way similar to that of water.
   a) Write the equilibrium reaction of liquid ammonia.
   b) Will potassium amide, KNH$_2$, be an acid or a base in liquid ammonia?
   c) Ammonium chloride can be used to titrate potassium amide in liquid ammonia. Write the chemical equation for the reaction of potassium amide with ammonium chloride in liquid ammonia.

3) A solution contains 0.775 g of ethylamine, C$_2$H$_5$NH$_2$, per 100.0 mL of solution. Electrically conductivity experiments show that 0.915% of the ethylamine has reacted with water. Write the equation for this reaction. Calculate the pH of the solution.

4) Hypophosphorous acid, H$_3$PO$_2$ and phosphoric acid, H$_3$PO$_4$, have approximately the same acid strengths. From this information, and noting the possibility that one or more hydrogens may be bonded directly to the phosphorus atom, draw the structural formula of hypophosphorous acid. How many grams of sodium hydroxide would be required to neutralize completely 1.00 g of this acid?