Acids and Bases Review

Honors

1. Classify each of the following properties as characteristics of an acid (A) or base (B).
   a. Dissociates to produce H^+ ions
   b. Dissociates to produce OH^- ions
   c. Tastes sour
   d. Tastes bitter
   e. Turns pH paper red
   f. Turns pH paper blue
   g. Feels slippery
   h. Reacts with metals to produce hydrogen gas
   i. Turns pink with phenolphthalein
   j. Turns yellow with bromothymol blue
   k. Turns cabbage juice blue/green
   l. Turns cabbage juice pink.

2. Complete the following table.

$[H^+]$	pH	pOH	$[OH^-]$	Acidic or basic
		2.25		
0.050 M				

3. Classify the following substances as acidic or basic and determine the $[H^+]$ and $[OH^-]$.
   a. Milk, pH =6.40

   b. Lye, pOH= 2.64

4. Determine the pH and pOH of the following solutions.
   a. 0.014 M HCl

   b. 4.8×10^{-5} M $Ba(OH)_2$

5. A titration is carried out between strontium hydroxide and nitric acid. Give the balanced chemical equation for this reaction. A 15.00 mL of 0.20 M strontium hydroxide is used to titrate 10.00 mL of nitric acid. Determine the concentration, pH and pOH of the nitric acid solution. Calculate the mass of the salt produced in the reaction.

6. An acid called "benzoic acid" (HA) is titrated with a solution of sodium hydroxide. The balanced equation for the neutralization reaction can be written as follows: HA + NAOH → NaA + H_2O

A sample of benzoic acid is weighted and the mass is recorded. The acid is then dissolved in water to make a solution. The solution is titrated using sodium hydroxide and the volume required for the reaction to be complete is recorded. The data collected for the experiment is shown below.

Concentration of NaOH = 0.500 M
Average Volume of NaOH = 20.60 mL
Mass of benzoic Acid = 1.30 g

a. Determine the moles of sodium hydroxide used in the experiment.

b. How many moles of benzoic acid are required in the reaction?

c. From the moles and the mass of benzoic acid, determine the molar mass of benzoic acid.

d. Benzoic acid has the following composition: 68.84 % carbon 4.95% hydrogen, and 26.20 % oxygen. Determine the formula for benzoic acid.

e. From the formula, calculate the actual molar mass for benzoic acid. Calculate the percent error for this experiment.