Acid Base Homework 1

These questions are designed to help you go over the portion of the course which considered acids and bases. These questions are similar to those you might see on an exam.

1. What is the H^+ concentration in a 2.00 liter solution that is made with 2×10^{-7} moles HCl?

   a) 1×10^{7}

   b) 1×10^{-7}

   c) $1 \times 10^{-3.5}$

   d) none of these

2. What is the pH of the solution in part 1. Be as specific as you can be and give your reasons.

3. If you have a 0.0500 M NaOH solution and you need 50 ml of a 0.00100 M NaOH solution, how much of the 0.0500 M solution should you use to make the dilute solution?

4. Would the dilute solution in question 3 be acidic or basic?

5. Commonly small spills of acids or bases are cleaned up by diluting the acid or base with water. How much water would you need to add to 1ml of a 0.0500M NaOH solution in order to get a neutral solution? (A neutral solution has a [OH-] =1.00 x 10^{-7} M.) This is a dilution problem.

6. The acid H_2SO_4 has 2 protons that can be removed to form SO_4^{2-}. Write a balanced chemical equation for the reaction between H_2SO_4 and NaOH that produces SO_4^{2-} Then write a net ionic equation for this same reaction.

7. If 9.00×10^{-4} moles of H_2SO_4 react with NaOH, to form SO_4^{2-}, how many moles of NaOH are used?

8. If $Ba(OH)_2$ were used rather than NaOH, how many moles of $Ba(OH)_2$ would be needed?

9. The pH scale is a measure of the acidity of a solution, it is based on the $[H^+]$ concentration of the solution. Given this why does the pH increase when the $[H^+]$ concentration goes down?

10. Which is more acidic lemon juice which has a pH of 2.2 or orange juice that has a pH of 3.6?

11. What is the **approximate** [H^+] concentration of each of these solutions. (You will probably find it easiest to give your answer in scientific notation.

12. You need to measure the pH of a solution precisely. You have pH paper and a pH meter available. It will take longer to use the pH meter. Which method of measuring pH should you use and why?

13. HCl was titrated with a 0.099 M NaOH solution. The endpoint of the titration was reached when 27.89 ml of the NaOH solution had been added. What as the the number of moles of HCl in the solution. (The endpoint of the titration is when the number of moles of HCl = the number of moles of NaOH)

14. If the 30ml of a stock HCl solution was used in the titration, what is the concentration of HCl in the stock solution?