**Acid-Base Water, pH and pOH Worksheet**

(from http://www2.ucdsb.on.ca/tiss/stretton/CHEM2/acidwk01.htm)

1. Calculate the pH of a solution with [H+] = 5 x 10-5 M.

2. Calculate the pH of a solution with [H+] = 1 M.

3. Calculate the pH of a 0.01 M solution of HCl.

4. What is the pH of 0.0010 M HCl?

5. If you have a 0.0050 M solution of nitric acid, what is the pH of this solution?

6. A certain brand of beer had a hydrogen ion concentration equal to 1.9 X 10-5 mol/L. What is the pH of this beer?

7. A soft drink was put on the market [H+]=1.4 X 10-5 mol/L. What is its pH?

8. Calculate the pH of a 0.0500 M solution of **NaOH**.

9. Calculate the pH of a 7.5 x 10-6 M solution of **KOH**.

10. Determine the pH of acetic acid in solutions with concentrations of (a) 0.000010 M and (b) 0.0000010 M.

11. Calculate the value of both pH and pOH of the following solutions:

(a) 0.020 M HCl

(b) 0.0020 M **NaOH**

(c) A blood specimen containing 7.2 x 10-8 H+ mole/L. Is the blood specimen slightly acidic or

slightly basic?

(d) 0.00035 M **LiOH**

12. Find [H+] of a solution with pH = 3.

13. "Calcareous soil is soil rich in calcium carbonate (lime). The pH of such soil generally ranges from just over 7 to as high as 8.3. What value of [H+] corresponds to a pH of 8.3? Is the soil slightly acidic or slightly basic?

14. What is the [H+] of a solution having a pH of 3.4?

15. Find **[OH-]** of a solution with **pH** = 8.

16. Determine the [OH-], [H+], pOH and pH of a 0.01 mol/L **LiOH** solution.

17. Determine the [OH-], [H+], pOH and pH of a 0.045 mol/L HCl solution.

18. Find the values of [H+], pOH and [OH-] that correspond to each of the following values of pH.

(a) 2.90 (the approximate pH of lemon juice)

(b) 3.85 ( the approximate pH of sauerkraut)

(c) 10.81 (the pH of milk of magnesia)

(d) 4.11 (the pH of orange juice, on the average)

(e) 11.61 (the pH of dilute, household ammonia)

19. What is the pOH of a 0.0000050 M **NaOH** solution?

What is the pH of this solution?

20. Determine the [OH-], [H+], pOH and pH of a 0.5 M **KOH** solution.

**Answers (in random order):**

2.0×10-14 M 2.0×10-13 M 1×10-12 M 2.45×10-12 M 7.94×10-12 M 1.5×10-11 M 6.31×10-11 M 1.29×10-10 M

5.00×10-9 M 1.0×10-6 M 7.76×10-5 M 0.000141 M 4.0×10-4 M 0.000646 M 0.001 M 0.00126 M 0.00407 M 0.01 M 0.045 M 0.0 0.3 0.5 M 1.3 1.7 2 2.0 2.3 2.39 2.7 3.0 3.19 3.5 4.3 4.7 4.9 5 5.3 6 6.9 7.1 8.7 8.9 9.89 10.2 10.5 11.1 11.3 12 12.3 12.7 12.7 13.7