**Notes on Acids and Bases**

**Pgs. 243-255**

**Properties of Acids and Bases (p. 243-245)**

1. An **Acid** is a compound that produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when dissolved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. List 2 Properties of Acids:

3. A **Base** is a compound that produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when dissolved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. List 2 Properties of Bases:

5. Define **Indicator:**

6. Litmus paper turns \_\_\_\_\_\_\_\_\_\_\_\_\_ when dipped in an ACID and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ when dipped in a BASE.

7. Adding and ACID to water increases \_\_\_\_\_\_\_\_\_\_\_\_\_, while adding a BASE to water increases \_\_\_\_\_\_\_\_.

8. You test an unknown solution in the lab with 3 different indicators and get the results listed below. Use the table below to determine the approximate pH of the solution.

 Methyl Red – solution turns Yellow

 Litmus Paper – paper turns Blue

 Thymol Blue – solution turns Yellow

|  |  |  |
| --- | --- | --- |
| **Indicator** | **pH Range** | **Color Change** |
| Methyl Red | 4.8-6.0 | Red-Yellow |
| Litmus Paper | 5.0-8.0 | Red-Blue |
| Thymol Blue | 8.0-9.6 | Yellow-Blue |

**pH Scale (p. 246-249)**

9. Label the pH Scale below with the following terms and fill in the boxes and blanks blanks:

Acid pH of pure water

Base H+

Neutral OH-

[H+] < [\_\_\_\_\_]

[\_\_\_\_] > [OH-]

[H+] = [OH-]

10. Fill in the blank spaces on the table below **(notice the numbers are not the same as in the book)**:

|  |  |  |
| --- | --- | --- |
| [H+} in mol/L | [H+] in mol/L (scientific notation) | pH |
| 0.1 |  | 1 |
|  | 1.0 x 10-2 |  |
| 0.0001 |  | 4 |
| 0.000001 |  |  |
|  | 1.0 x 10-11 |  |
|  |  | 14 |

11. The pH scale is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ scale.

12. What is the formula used to calculate pH?

13. As the concentration of Hydrogen ions [H+] increases, the pH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

14. Use the formula in #11 to **calculate** the pH of following solutions and decide if they are acidic, basic, or neutral.

1. [H+] = 1.3 x 10-12
2. [H+] = 3.0 x 10-3

**Combining Acids and Bases (p. 251-254)**

15. Define Neutralization:

16. Write the general formula for the reaction between an Acid and a Base (this is called a neutralization reaction)

17. Examples of formulas for some Acids are:

18. Examples for formulas for some Bases are:

19. All acid-base reactions also produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compounds.

20. What is the purpose of a Titration?

21. Describe the process of Titration.

22. Suppose you **Titrate** 50 mL of Hydrochloric Acid (HCl) with 30 mL of 0.4M Sodium Hydroxide (NaOH), use the formula below to calculate the concentration of the Hydrochloric Acid.

**Formula**: (**Ma)(Va)= (Mb)(Vb)** Ma = Molarity (concentration) of Acid Mb = Molarity (concentration) of Base

Va = Volume of Acid Vb = Volume of Base