

**Acid and Base Practice Test** - Name: \_\_\_\_\_ Period: \_\_\_\_ Date: \_\_\_\_\_

- A solution in which the hydroxide-ion concentration is  $1 \times 10^{-5}$  M is:  
a. acidic                      b. basic                      c. neutral                      d. none of these
- The formula of the hydrogen ion is often written as:  
a.  $\text{H}_2\text{O}$                       b.  $\text{OH}^-$                       c.  $\text{H}^+$                       d.  $\text{H}_3\text{O}^+$
- What is the pH of a solution in which  $[\text{H}^+] = 1 \times 10^{-12}$ ?  
a. -1.0                      b. -2.0                      c. 2.0                      d. 12.0
- What is the pH of a 0.01 M hydrochloric acid solution?  
a.  $10^{-2}$                       b. 12.0                      c. 2.0                      d.  $10^{-12}$
- What is the name of the acid whose formula is  $\text{H}_2\text{SO}_4$ ?  
a. hydrosulfuric acid    b. sulfurous acid                      c. sulfuric acid                      d. hyposulfurous acid
- A solution in which the  $[\text{H}^+] = 1.0 \times 10^{-4}$  mol/L is said to be:  
a. acidic                      b. basic                      c. neutral                      d. none of these above
- When 42.5mL of 1.03M NaOH is added to 50.0mL of vinegar (acetic acid), the indicator changes color. (hint:  $M_1V_1 = M_2V_2$ )  
$$\text{CH}_3\text{COOH}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CH}_3\text{COONa}(\text{aq})$$
  
What is the concentration of acetic acid in vinegar?    a. 3.45M    b. 2.44M    c. 0.88M    d. 1.24M
- A solution with a pH of 9 has a  $[\text{OH}^-]$  concentration of:  
a.  $1.0 \times 10^{-14}$  mol/L                      b.  $1.0 \times 10^{-9}$  mol/L                      c.  $1.0 \times 10^{-5}$  mol/L                      d.  $1.0 \times 10^{-7}$  mol/L
- Which of the following is true about bases?  
a. have a bitter taste                      b. feel slippery  
b. react with acids to form water and salt                      d. all of these

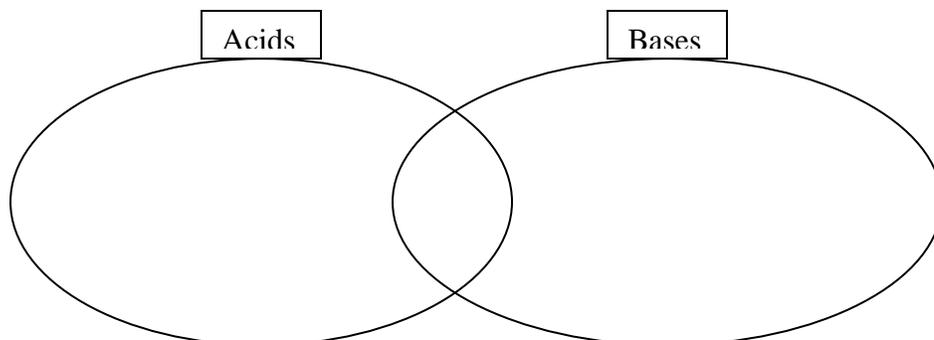
**Short Answer: you must show your work to get full credit.**

Name the following acids:

- |                             |                   |
|-----------------------------|-------------------|
| a. HI                       | b. KOH            |
| c. $\text{Mg}(\text{OH})_2$ | d. $\text{HNO}_2$ |

1. Compare and contrast strong and weak acids. What is it that makes an acid strong?

2. and 3. Draw a Venn diagram showing two properties of acids, two of bases, and two that acids and bases have in common.



4. What is the pH of a 4.2 L solution containing 0.51 g of nitric acid?

5. Explain how **water** can act as an acid or a base.

6. Describe both the Arrhenius Theory and Bronsted-Lowery Theory for acids and bases.  
What is the advantage of the Arrhenius Theory?  
What is the advantage of the Bronsted-Lowery Theory?

7. What is a buffer (also provide an example)?

**BCR:** Muriatic acid (concentrated HCl) is commonly used to remove excess mortar from the surface of newly erected brick structures. Suppose a new fireplace has been built in your home. The brick mason accidentally spills some of the muriatic acid on the floor. Fearing that the floor will be permanently damaged, and knowing that you have recently completed a chemistry course, he asked for your advice on cleaning up the spill.

- Suggest a common household chemical that could be used to safely clean up the spill.
- Provide the formula for the chemical you chose and explain your choice.
- Describe the chemical reaction that takes place between the acid and the household chemical.