

**Acids & Bases**

Describe these household substances:

- a) acidic  
b) basic  
c) neutral
- Sugar water \_\_\_\_\_
  - Vinegar \_\_\_\_\_
  - Rubbing Alcohol \_\_\_\_\_
  - Milk of Magnesia \_\_\_\_\_
  - Household ammonia \_\_\_\_\_

**Questions 6 - 10**

Match the household chemical with its formula

- |                        |  |
|------------------------|--|
| ___ 6. Vinegar         | a) NaOH  |
| ___ 7. Pool Acid       | b) NaHCO <sub>3</sub>                            |
| ___ 8. Rubbing Alcohol | c) HCl   |
| ___ 9. Drano           | d) HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> |
| ___ 10. Baking Soda    | e) C <sub>3</sub> H <sub>7</sub> OH              |

11. A substance that turns cabbage juice blue and only slightly lights up a light bulb is a:
- a) strong acid      c) weak acid  
b) strong base      d) weak base

12. Which of the following substances is a base?
- a) H<sub>2</sub>O                  c) Ca(OH)<sub>2</sub>  
b) HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub>          d) H<sub>2</sub>SO<sub>4</sub>

**PRACTICE QUESTIONS**

13. When an acid and a base react, the products are
- a) salt and water      c) base and acid  
b) salt and base      d) water and acid
14. When NaOH is mixed with H<sub>2</sub>SO<sub>4</sub>, one of the products is
- a) NaSO<sub>4</sub>                  c) H<sub>2</sub>  
b) H<sub>2</sub>OH                  d) Na<sub>2</sub>SO<sub>4</sub>
15. A property of acids are that they
- a) taste sour              c) feel slippery  
b) taste bitter             d) neutralize water
16. How many grams of sodium hydroxide pellets, NaOH, are required to prepare 50.0 mL of a 0.150 M solution?
- a) 0.300                      c) 3.00  
b) 2.00                      d) 200.
17. A common laundry bleach is 0.700 M sodium hypochlorite, NaOCl. Which one of the following statements is true?
- a) NaOCl is the solvent.  
b) The solution can be made by mixing 0.700 moles of NaOCl with 1.00 liter of water.  
c) A 0.500 Liter sample of bleach would contain 0.350 moles of NaOCl.  
d) Each of these statements is true.
18. What is the hydrogen ion concentration, [H<sup>+</sup>], of a solution in which the pH is 5?
- a) 5 x 10<sup>2</sup> M                  c) 5 x 10<sup>-1</sup> M  
b) 1 x 10<sup>5</sup> M                  d) 1 x 10<sup>-5</sup> M

19. When an acid is added to a solution of a base, what change in pH of the solution could be observed?
- An increase from 7 to 8
  - An increase from 3 to 8
  - A decrease from 7 to 6
  - A decrease from 9 to 5
20. What is the pH of 0.001 M HCl, assuming complete ionization?
- 1
  - 2
  - 3
  - 4

Consider the household product:

Vinegar,  $\text{HC}_2\text{H}_3\text{O}_2$

21. Is it an **acid** or a **base**? \_\_\_\_\_
22. **Circle** the portion of the formula that makes it an acid or a base.
23. Write an **equation** that shows why it is an acid or a base. (dissociation)
- \_\_\_\_\_
24. This substance is a \_\_\_\_\_ (weak/strong) \_\_\_\_\_ (acid/base).
25. A solution has an  $[\text{H}^+] = 0.000100 \text{ M}$ . What is the  $[\text{OH}^-]$ ? \_\_\_\_\_
- $1 \times 10^{-3}$
  - $1 \times 10^{-4}$
  - $1 \times 10^{-14}$
  - $1 \times 10^{-10}$
26. A  $1 \times 10^{-3} \text{ M}$  NaOH solution has an  $[\text{H}^+] =$  \_\_\_\_\_
- $1 \times 10^{-3}$
  - $1 \times 10^{-7}$
  - $1 \times 10^{-11}$
  - $1 \times 10^{-14}$
27. A  $1 \times 10^{-2} \text{ M}$  HCl solution has an pH = \_\_\_\_\_
- 2
  - 3
  - 7
  - 12
28. Write an equation that shows how  $\text{Ba}(\text{OH})_2$  neutralizes  $\text{HNO}_3$ .

Questions 29 - 31 refer to the following data collected in a titration experiment.

<b>Titration Data:</b>	
molarity of base	0.185 M
final volume of acid	22.75 mL
initial volume of acid	12.75 mL
final volume of base	25.25 mL
initial volume of base	3.50 mL

Calculate the **concentration** of the **acid**.  
Show **all work** including:

- the mathematical formula used
- values substituted into the formula
- units on all numbers, and a box around the answer.