

Acid-Base Review Worksheet-Accel

Name: _____ Per: _____

Complete the following. Show all of your work! Box or circle your answer.

- **Objective:** Identify & describe the properties of acids and bases

1. Compare and contrast the following:

- a. Acid properties and base properties
- b. Strong acid and weak acid (Include a list of strong acids)
- c. Strong base and weak base (include a list of strong bases)
- d. Acid-base indicator and pH meter
- e. Monoprotic acid and polyprotic acid
- f. Binary acid and ternary acid

- **Objective:** Identify the difference between Arrhenius' model and Bronsted-Lowry Model

2. Compare and contrast the following:

- a. Arrhenius acid and Arrhenius base
- b. Bronsted-Lowry acid and Bronsted-Lowry base
- c. Conjugate acid and conjugate base

3. Identify the acid/base pairs (use BA, BB, ca and cb):

- a. $\text{HC}_2\text{H}_3\text{O} + \text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{C}_2\text{H}_3\text{O}_2^-$
- b. $\text{H}_2\text{O} + \text{C}_2\text{H}_3\text{O}_2^- \leftrightarrow \text{HC}_2\text{H}_3\text{O}_2 + \text{OH}^-$

- **Objective:** Calculate pH and pOH

4. What are the hydroxide ion concentrations for solutions that have the following pH values?

- a. 4.0
- b. 8.0

5. What are the pH values for the following?

a. $[H^+] = 2.4 \times 10^{-6} \text{ M}$

b. $9.1 \times 10^{-9} \text{ M HCl}$

6. What are the $[H^+]$ for the following?

a. $\text{pH} = 13.2$

b. $\text{pOH} = 6.7$

c. $[OH^-] = 3.2 \times 10^{-6} \text{ M}$

d. $1.3 \times 10^{-12} \text{ M NaOH}$

7. Calculate the pH from the following $[OH^-]$.

a. $4.3 \times 10^{-4} \text{ M}$

b. $3.33 \times 10^{-7} \text{ M}$

- **Objective: Calculate using the ion product constant for water**

8. Calculate the $[OH^-]$ for the following.

a. $[H^+] = 1 \times 10^{-2} \text{ M}$

b. $2.7 \times 10^{-4} \text{ M H}_2\text{SO}_4$

9. What are the $[H^+]$ for the following?

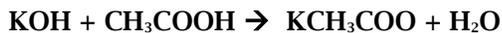
a. $[OH^-] = 3.2 \times 10^{-6} \text{ M}$

b. $1.3 \times 10^{-12} \text{ M NaOH}$

- **Objective:** Write balanced equations for neutralization reactions and do the calculations required for titrations

10. Determine the concentration of 15 mL of nitric acid (HNO₃) that is titrated with 10.5 mL of 2.5 M NaOH.

11. What volume of 0.25 M acetic acid would be necessary to neutralize 50.0 mL of 2.0 M potassium hydroxide?



12. 25.5 mL of 0.75 M hydrochloric acid is used to titrate 10.0 mL of calcium hydroxide. What is the concentration of the base? $2\text{HCl} + \text{Ca}(\text{OH})_2 \rightarrow \text{CaCl}_2 + 2\text{H}_2\text{O}$

13. When titrating, what would you expect the equivalence point pH to be for the following:

- a. A strong acid with a strong base _____
- b. A strong acid with a weak base _____
- c. A weak acid with a strong base _____

14. Complete the following statements.

- a. The process used to determine the concentration of an unknown solution is called _____.
- b. A reaction where an acid and a base react to form salt and water is called a _____ reaction.
- c. A substance that can act as both an acid and a base is called a(n) _____ substance.
- d. A hydrogen ion and a water molecule form a _____ ion.
- e. The equilibrium (ion product) constant of water has a symbol of _____ and a value of _____.
- f. The _____ has values of 0-14 and tells us whether a substance is an acid or a base.
- g. The _____ is reached when the [H⁺] and [OH⁻] are equal.
- h. The _____ is reached when the indicator changes color during a titration.