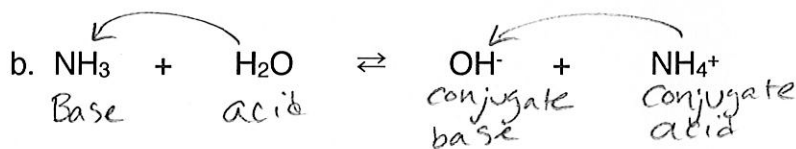
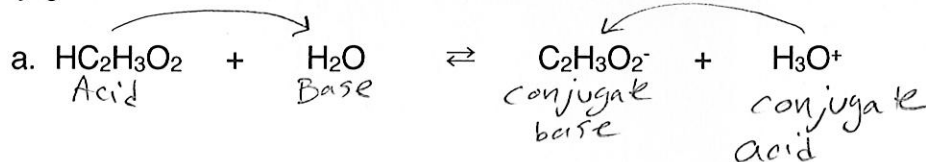


Name Key**Chapter 19 Review: Acids and Bases**

1. Label each property as that of an Acid, Base, or Both:

- a. H^+ donor Acid
- b. H^+ acceptor Base
- c. Produces H^+ ions Acid
- d. Produces OH^- ions Base
- e. pH is more than 7 Base

2. In the reactions below, label each substance as an acid, base, conjugate acid, or conjugate base. Draw arrows to show the movement of the H^+ ion.

3. What does it mean of a substance is amphoteric? Give an example of an amphoteric substance.

Amphoteric substances can act as acids or bases.
Water is an example.

4. $[H_3O^+] = 3.50 \times 10^{-4} M = [H^+]$

a. Calculate the pH value

$$pH = -\log(3.5 \times 10^{-4}) = \boxed{3.46}$$

b. Is this solution an acid or base?

(Because pH is less than 7)

CP Chemistry

5. $\text{pH} = 12.8$

a. Calculate the $[\text{H}^+]$

$$[\text{H}^+] = 10^{-\text{pH}} = 10^{-12.8} = \boxed{1.58 \times 10^{-13} \text{ M}}$$

b. Is this solution an acid or base? base Because pH is greater than 7

6. $[\text{OH}^-] = 1.8 \times 10^{-9} \text{ M}$

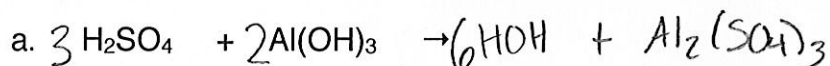
a. Calculate the pH

$$\text{pOH} = -\log([\text{OH}^-]) = -\log(1.8 \times 10^{-9}) = 8.74$$

$$\text{pH} = 14 - \text{pOH} = 14 - 8.74 = \boxed{5.26}$$

b. Is this solution an acid or base? Acid (pH is less than 7)

7. Predict the products of these neutralization reactions. Then balance.



8. If 25.0 mL of 0.500 M KOH are needed to neutralize 10.0 mL of HCl, what is the concentration of HCl?

$$\begin{aligned} V_B &= 25.0 \text{ mL} \\ M_B &= 0.500 \text{ M} \\ V_A &= 10.0 \text{ mL} \\ M_A &= ? \end{aligned} \quad \begin{aligned} M_A V_A &= M_B V_B \\ \frac{M_A V_A}{V_A} &= \frac{M_B V_B}{V_A} \end{aligned} \quad \begin{aligned} M_A &= \frac{M_B V_B}{V_A} = \frac{(0.500)(25.0)}{(10.0)} \\ M_A &= \boxed{1.25 \text{ M}} \end{aligned}$$

9. To determine the concentration of an HCl solution, 15.0 mL of this solution are titrated with a 1.00 M solution of KOH. Before titrating, a buret is filled with 1.00 M KOH to 3.35 mL. After reaching the equivalence point, the buret reading is 34.00 mL. Calculate the molarity of HCl.

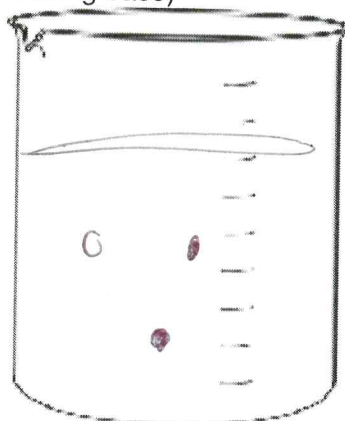
$$\begin{aligned} M_A &= ? \\ V_A &= 15.0 \text{ mL} \\ M_B &= 1.00 \text{ M} \\ V_B &= 34.00 - 3.35 = 30.65 \text{ mL} \end{aligned} \quad \begin{aligned} M_A &= \frac{M_B V_B}{V_A} = \frac{(1.00)(30.65)}{(15.0)} \\ M_A &= \boxed{2.04 \text{ M}} \end{aligned}$$

Honors Chemistry

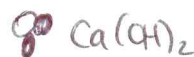
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9. Draw particle-level sketches of the following. Be sure to include a key.

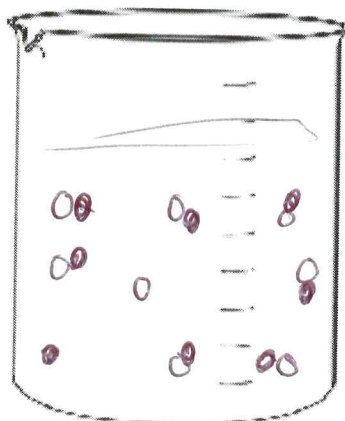
a. 0.05 M $\text{Ca}(\text{OH})_2$ (A dilute strong base)



key



b. 8.0 M $\text{HC}_2\text{H}_3\text{O}_2$ (a concentrated weak acid)



key



10. Write the ionization equations for both of the solutions you drew in question 9



11. What determines the strength of an acid or base?

extent of ionization. All ionized = strong
some ionized = weak