Name: _____ Date: _____

Acids & Bases (Mostly Review)

Homework Unit 10 - Topic 3

1. What produces hydrogen ions as the only positive ions in aqueous solution?

    1. KOH
    2. HBr
    3. NH_3
    4. NaCl

2. Which substance is an electrolyte?

    1. C_2H_5OH
    2. $C_6H_{12}O_6$
    3. $C_{12}H_{22}O_{11}$
    4. CH_3COOH

3. An example of a nonelectrolyte is

    1. $C_6H_{12}O_6(aq)$
    2. $K_2SO_4(aq)$
    3. NaCl(aq)
    4. HCl(aq)

4. A substance that conducts an electrical current when dissolved in water is called

    1. a catalyst
    2. a metalloid
    3. a nonelectrolyte
    4. an electrolyte

5. An aqueous solution of an ionic compound turns red litmus blue, conducts electricity, and reacts with an acid to form a salt and water. This compound could be

    1. HCl
    2. NaI
    3. KNO_3
    4. LiOH

6. Which species can act as an Arrhenius acid in aqueous solution?

    1. Cl^-
    2. KH
    3. Li^+
    4. HCl

7. A student was given four unknown solutions. Each solution was checked for conductivity and tested with phenolphthalein. The results are shown in the data table below.

Solution	Conductivity	Color with Phenolphthalein
A	Good	Colorless
B	Poor	Colorless
C	Good	Pink
D	Poor	Pink

    Based on the data table, which unknown solution could be 0.1 M NaOH?

    1. *A*
    2. *B*
    3. *C*
    4. *D*

8. A sample of $Ca(OH)_2$ is considered to be an Arrhenius base because it dissolves in water to yield

    1. Ca^{2+} ions as the only positive ions in solution
    2. H_3O^+ ions as the only positive ions in solution
    3. OH^- ions as the only negative ions in solution
    4. H^- ions as the only negative ions in solution

9. An Arrhenius acid has

    1. only hydroxide ions in solution
    2. only hydrogen ions in solution
    3. hydrogen ions as the only positive ions in solution
    4. hydrogen ions as the only negative ions in solution

10. Which substance can act as an Arrhenius base in an aqueous solution?

    1. LiCl
    2. $LiNO_3$
    3. LiBr
    4. LiOH

11. Which formula represents a salt?

    1. KOH
    2. KCl
    3. CH_3OH
    4. CH_3COOH

12. Given the following solutions:

    - Solution *A*: pH of 10
    - Solution *B*: pH of 7
    - Solution *C*: pH of 5

13. Which 0.1 M solution has a pH greater than 7?

    1. CH_3OH
    2. HCl
    3. KCl
    4. KOH

14. Which statement describes the characteristics of an Arrhenius base?

    1. It changes blue litmus to red and has a pH less than 7.
    2. It changes blue litmus to red and has a pH greater than 7.
    3. It changes red litmus to blue and has a pH less than 7.
    4. It changes red litmus to blue and has a pH greater than 7.

15. As an aqueous solution becomes more acidic, the hydroxide ion concentration

    1. decreases
    2. increases
    3. remains the same

18. Which are the relative ion concentrations in an acid solution?

    1. more H^+ ions than OH^- ions
    2. fewer H^+ ions than OH^- ions
    3. an equal number of H^+ ions and OH^- ions
    4. H^+ ions but no OH^- ions

16. A solution of a base differs from a solution of an acid in that the solution of a base

    1. is able to conduct electricity
    2. is able to cause an indicator color change
    3. has a greater $[H_3O^+]$
    4. has a greater $[OH^-]$

17. Which substance can be classified as an Arrhenius acid?

    1. HCl
    2. NaCl
    3. LiOH
    4. KOH

19. When the pH of a solution changes from a pH of 5 to a pH of 3, the hydronium ion (H^+) concentration is

    1. 0.01 of the original content
    2. 0.1 of the original content
    3. 10 times the original content
    4. 100 times the original content

20. Which solution will turn phenolphthalein from clear to pink? (Look at Table K and L!!)

    1. $H_2S(aq)$
    2. $NH_3(aq)$
    3. $SO_2(aq)$
    4. $CO_2(aq)$

21. A compound whose water solution conducts electricity and turns phenolphthalein pink is

    1. HCl
    2. $HC_2H_3O_2$
    3. NaOH
    4. CH_3OH

22. When phenolphthalein indicator is added to a colorless solution with a pH of 10, a student observes and concludes that the tested solution

    1. remains colorless and is basic
    2. remains colorless and is acidic
    3. turns pink and is basic
    4. turns pink and is acidic

23. Which reaction occurs when equivalent quantities of H^+ (a.k.a. H_3O^+) and OH^- are mixed?

    1. oxidation
    2. reduction
    3. hydrolysis
    4. neutralization

24. How many milliliters of 0.600 M HCl are required to exactly neutralize 100. milliliters of 0.300 M Li(OH)?

    1. 25.0 mL
    2. 50.0 mL
    3. 100. mL
    4. 200. mL

25. When NaOH(*aq*) reacts completely with HCl(*aq*) and the resulting solution is evaporated to dryness, the solid remaining is

    1. an ester
    2. an alcohol
    3. a salt
    4. a metal

26. If 20. milliliters of 4.0 M NaOH is exactly neutralized by 20. milliliters of HCl, the molarity of the HCl is

    1. 1.0 M
    2. 2.0 M
    3. 5.0 M
    4. 4.0 M

27. A neutral solution of a salt in water contains

    1. fewer H_3O^+ ions than OH^- ions
    2. more H_3O^+ ions than OH^- ions
    3. an equal number of H_3O^+ ions and OH^- ions
    4. neither H_3O^+ ions nor OH^- ions

28. Which salt is formed when hydrochloric acid is neutralized by a potassium hydroxide solution?

    1. potassium chloride
    2. potassium chlorate
    3. potassium chlorite
    4. potassium perchlorate

29. Which equation represents a neutralization reaction?

    1. $Ca(OH)_2 \rightarrow Ca^{2+} + 2OH^-$
    2. $CaCl_2 \rightarrow Ca^{2+} + 2Cl^-$
    3. $H^+ + OH^- \rightarrow HOH$
    4. $H^+ + F^- \rightarrow HF$

30. Which reaction represents the process of neutralization?

    1. $Mg(s) + 2HCl(aq) \longrightarrow MgCl_2(aq) + H_2(g)$
    2. $HCl(aq) + KOH(aq) \longrightarrow KCl(aq) + H_2O(l)$
    3. $Pb(NO_3)_2(aq) + CaCl_2(aq) \longrightarrow Ca(NO_3)_2(aq) + PbCl_2(s)$
    4. $2KClO_3(s) \longrightarrow 2KCl(s) + 3O_2(g)$

31. A solution with a pH of 11 is first tested with phenolphthalein and then with litmus. What is the color of each indicator in this solution?

    1. Phenolphthalein is colorless and litmus is blue.
    2. Phenolphthalein is colorless and litmus is red.
    3. Phenolphthalein is pink and litmus is blue.
    4. Phenolphthalein is pink and litmus is red.

32. Equal volumes of 0.1 M NaOH and 0.1 M HCl are thoroughly mixed. The resulting solution has a pH closest to

    1. 5
    2. 7
    3. 3