

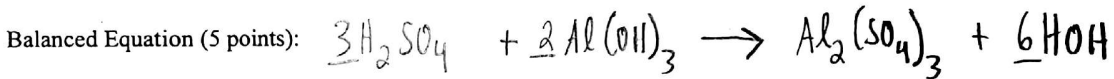
UNIT 13: ACIDS & BASES GROUP PRACTICE

1. B
2. D
3. C
4. C
5. B
6. C
7. A
8. A
9. D
10. B

11. B
12. B
13. A
14. C
15. C
16. C
17. B
18. B
19. C
20. D

21. B
22. B
23. B
24. B
25. D
26. A
27. B
28. C
29. C
30. D

31. SHOW YOUR WORK!



Calculation (5 points):

$$(H^+)M_A V_A = (OH^-)M_B V_B \rightarrow (2)(0.723)(82.5) = (3)M_B(34.0) \rightarrow M_B = 1.17M$$

32. Salt Hydrolysis problems: (2 pts. each)

- A) $CoCl_2$ Parent acid HCl Parent base $Co(OH)_2$
- B) $CuSO_4$ Parent acid H_2SO_4 Parent base $Cu(OH)_2$
- C) K_2CO_3 Parent acid H_2CO_3 Parent base KOH

pH Calculations. (2 pts. each)

	$[H^+]$	pH	$[OH^-]$	pOH	Acidic or Basic
33.	$2.5 \times 10^{-9} M$	8.60	$3.98 \times 10^{-6} M$	5.4	B
34.	$2.5 \times 10^{-6} M$	5.60	$3.98 \times 10^{-6} M$	8.4	A
35.	<u>$0.0011 M$</u> or <u>$1.1 \times 10^{-3} M$</u>	2.95	$8.9 \times 10^{-12} M$	11.05	A

Name _____ Date _____ Period _____

ACIDS AND BASES GROUP PRACTICE

Choose the best answer for each of the following. (2 points each)

1. According to Arrhenius, how do you recognize a base?
 - a. Contains H⁺
 - b. Contains OH⁻
 - c. Contains O₂
 - d. Contains Cl⁻
2. Which of the following is the most acidic?
 - a. pH = 13
 - b. pOH = 4
 - c. pH = 8
 - d. pOH = 12
3. Which of the following is most likely an amphoteric substance?
 - a. H₃PO₄
 - b. H⁺
 - c. H₂O
 - d. PO₄³⁻
4. In the reaction $\text{HC}_2\text{H}_3\text{O}_2 + \text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{C}_2\text{H}_3\text{O}_2^-$, the H₃O⁺ is the _____.
 - a. acid
 - b. base
 - c. conjugate acid
 - d. conjugate base
5. Reactions between an Arrhenius acid and an Arrhenius base _____.
 - a. produce a salt as the only product
 - b. produce a salt and water as the products
 - c. produce a salt and hydrogen gas as the products
 - d. do not produce a salt as a product
6. In the reaction $\text{HClO}_3 + \text{NH}_3 \leftrightarrow \text{NH}_4^+ + \text{ClO}_3^-$, the conjugate acid of NH₃ is _____.
 - a. HClO₃
 - b. ClO₃⁻
 - c. NH₄⁺
 - d. not shown
7. A solution that has a pH of 4 _____.
 - a. is always acidic
 - b. is always basic
 - c. is always neutral
 - d. may be either acidic, basic, or neutral
8. If the [H⁺] of a solution is greater than [OH⁻], the solution _____.
 - a. is always acidic
 - b. is always basic
 - c. is always neutral
 - d. may be either acidic, basic, or neutral
9. Bases can be neutralized when they _____.
 - a. melt
 - b. dissolve in water
 - c. react with a salt
 - d. react with an acid
10. An electron-pair acceptor is a(n) _____.
 - a. Brønsted-Lowry base
 - b. Lewis acid
 - c. Lewis base
 - d. Arrhenius acid
11. What is the conjugate acid of the base: HCO₃⁻?
 - a. CO₃²⁻
 - b. H₂CO₃
 - c. H₂O
 - d. H⁺
12. According to the Arrhenius definition, an acid contains _____.
 - a. hydrogen and does not ionize in water
 - b. hydrogen and ionizes to form hydrogen ions in water
 - c. oxygen and ionizes to form hydroxide ions in water
 - d. oxygen and ionizes to form oxygen ions in water
13. In the reaction $\text{HSO}_4^- + \text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{SO}_4^{2-}$, HSO₄⁻ acts as a(n) _____.
 - a. acid
 - b. base
 - c. spectator ion
 - d. salt
14. In the reaction $\text{HF} + \text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{F}^-$, the acid and its conjugate base are _____.
 - a. HF and H₂O
 - b. HF and H₃O⁺
 - c. HF and F⁻
 - d. H₂O and F⁻
15. Which of the following is a diprotic acid?
 - a. HNO₃
 - b. H₃PO₄
 - c. H₂SO₄
 - d. H₃P
16. Which of the following is the correct formula for chloric acid?
 - a. HClO
 - b. HClO₂
 - c. HClO₃
 - d. HClO₄
17. A compound that is formed when a base gains a proton is called a _____.
 - a. conjugate base
 - b. conjugate acid
 - c. strong base
 - d. strong acid
18. A Brønsted-Lowry base is a(n) _____.
 - a. producer of OH⁻ ions
 - b. proton acceptor
 - c. electron-pair donor
 - d. electron-pair acceptor
19. Which of the following do NOT represent a conjugate acid/base pair?
 - a. H₃O⁺/H₂O
 - b. H₂O/OH⁻
 - c. H₂CO₃/CO₃²⁻
 - d. all are conjugate pairs
20. What is the pH of a 5.0 x 10⁻³ M NaOH solution?
 - a. 5.0 x 10⁻³
 - b. 2.0 x 10⁻¹²
 - c. 2.30
 - d. 11.70
21. Arrhenius bases _____.
 - a. produce H₃O⁺ ions in water
 - b. produce OH⁻ ions in water
 - c. are electron-pair donors
 - d. are proton acceptors
22. What is the definition of a Lewis base?
 - a. accepts electrons
 - b. donates electrons
 - c. accepts protons
 - d. donates protons
23. Which of the following is NOT a property of a base?
 - a. feels slippery
 - b. tastes sour
 - c. turns litmus paper blue
 - d. is an electrolyte (conducts electricity in water)
24. Acids cause litmus paper to turn _____.
 - a. blue
 - b. red
 - c. yellow
 - d. colorless
25. A Brønsted-Lowry acid is _____.
 - a. an electron-pair acceptor.
 - b. an electron-pair donor.
 - c. a proton acceptor.
 - d. a proton donor.
26. Potassium chloride and water would be the products of the reaction between _____.
 - a. KOH and HCl
 - b. KClO₄ and H₂O
 - c. KOH and HClO₄
 - d. K and HClO₄
27. Which of the following represents a hydronium ion?
 - a. H₂O
 - b. H₃O⁺
 - c. OH⁻
 - d. H⁺
28. A salt contains an anion from the parent _____.
 - a. electron
 - b. base
 - c. acid
 - d. water
29. What is the correct name of this compound: Cr(OH)₃?
 - a. chromium hydroxide
 - b. chromium oxide
 - c. chromium (III) hydroxide
 - d. chromium (III) oxide
30. Which of the following is NOT considered an electrolyte?
 - a. acids
 - b. bases
 - c. ionic compounds
 - d. covalent compounds

Show all work for the following question for credit:

31. If 82.5 mL of 0.723 M H_2SO_4 titrates completely with 34.0 mL of $\text{Al}(\text{OH})_3$ solution, what is the molarity of the $\text{Al}(\text{OH})_3$ solution? Show the titration by writing the balanced equation between the acids and the base.

Balanced Equation (5 points):

Calculation (5 points):

32. What is the parent acid and parent base of the following salts (2 pts. each):

- A) CoCl_2 Parent acid _____ Parent base _____
- B) CuSO_4 Parent acid _____ Parent base _____
- C) K_2CO_3 Parent acid _____ Parent base _____

Fill in the tables below (2 points each box)

	$[\text{H}^{+1}]$	pH	$[\text{OH}^{-1}]$	pOH	Acidic or Basic?
33.	2.5×10^{-9}				
34.		5.60			
35.			8.9×10^{-12}		