Exam 2 Test Prep

% Ionization	Buffer	pH	Common-Ion Effect	Irreversible Reaction
Cation	Oxyacid	Anion	pOH	Equivalence Point
Binary Acid	Lewis Acid	Titration	Reversible Reaction	Bronsted-Lowry Base
Lewis Base	Hydrolysis	Carboxylic Acid	Amphoteric	Bronsted-Lowry Acid

1. An acid that consists of an H, O, and one other element, which is a nonmetal, is an: _____

2. An acid that consists of an H and one other element is a: _____

3. A proton donor: _____

4. The quantity of weak acid that ionizes in a solution, expressed as a percentage: _____

5. A negatively charged ion: _____

6. When the amount of acid is equal to the amount of base in a titration/reaction: _____

7. A proton acceptor: _____

8. A positively charged ion: _____

9. An organic acid that contains the -COOH group: _____

10. Represents the hydrogen ion concentration: _____

11. If we have a solution containing several types of ions and equilibrium is achieved, when we add another species containing the same ion, to the existing solution, reduction in the degree of dissociation of the first species is observed. _____

12. A solution of a weak conjugate acid-base pair that resists drastic changes in pH: _____

13. The chemical breakdown of a compound due to its reaction with water: _____

14. Represents the hydronium ion concentration: _____

15. An e^- pair acceptor: _____

16. A technique in which an acid or base of known concentration is added to an acid or base of unknown concentration: _____

17. The system must take another path to return to the original state: _____

18. An e^- pair donor: _____

19. A compound that can act as either an acid or a base: _____

20. The system can follow the same path in reverse to get back to the original state: _____

1. Calculate the pH of 0.00125 M HCl ($K_a = 3.5 \times 10^{-2}$)

$$HCl \leftrightarrows H^+ + Cl^-$$

2. What is the pH of a buffer that is 0.12 M in lactic acid ($HC_3H_5O_3$) and 0.10 M in sodium lactate? For lactic acid, $K_a = 1.4 \times 10^{-4}$

$$HC_3H_5O_3\ (aq) \leftrightarrows H^+\ (aq) + C_3H_5O_3^-\ (aq)$$

3. The K_a for niacin (C_5H_4NCOOH) is 1.6×10^{-5}. What is the pH of a 0.010 M solution of niacin?

$$C_5H_4NCOOH \leftrightarrows C_5H_4NCOOH^- + H^+$$

4. Write the equilibrium equation for the base and solve for the pH:

$$NH_3 + H_2O \leftrightarrow NH_4^+ + OH^-$$

5. Calculate the pH of 0.119 M pyridine:

$$C_5H_5N + H_2O \leftrightarrow C_5H_5NH^+ + OH^-$$

6. Find the molar solubility of Ag_2CrO_4 in pure water if the solubility product constant for silver chromate is 1.1×10^{-12}.

$$Ag_2CrO_4 \rightarrow 2Ag^+ + CrO_4^{2-}$$

7. What are ways that we can make a buffer?

8. What is the concentration of [Cl^-] in the final solution if you pour 10.0 mL of 0.10 M NaCl, 10.0 mL of 0.10 M KOH, and 5.0 mL of 0.20 M HCl solutions together to make a total volume 100.0 mL.

9. If the pH of a saturated solution of $Ba(OH)_2$ is 12. What is the value of solubility product (Ksp) of $Ba(OH)_2$?

10. How do we determine if a precipitate will form if we have the values of the reaction quotient, Q, and the solubility product constant, K_{sp}?

11. What is the pH range of an acid? Of a base? Neutral?

12. What is the difference between weak and strong acids/bases?

13. Calculate the percent ionization in a 1.0M solution of nitrous acid. ($Ka = 4.5 \times 10^{-4}$)

14. Vinegar is a dilute solution of acetic acid ($HC_2H_3O_2$). If the concentration of $HC_2H_3O_2$ in a vinegar solution is 0.240M, calculate the percent ionization of acetic acid. ($K_a = 1.75 \times 10^{-5}$)