

Pre-AP CHEMISTRY Unit Objectives
General Equilibrium and Acid Base Equilibrium
Textbook Chapters and Sections 19.2, 20 and 21

General Equilibrium

1. Use Le Chatlier's principle to predict changes in the equilibrium position due to changes in concentration, temperature, and pressure. (19.2)
2. Write equilibrium constant expressions for monophasic reactions and calculate K_{eq} from experimental data. (19.2)

Acids and Bases

3. Use the acid naming rules to name and write the formulas for acids. (20.1)
4. List the properties and common examples of acids and bases (20.1)
5. Write the equation for the self-ionization of water (20.2)
6. Calculate the pH of a solution given the $[H^+]$ or $[OH^-]$ and vice versa (20.2)
7. Calculate the pH of a solution given the concentration of a strong acid or strong base (20.2)
8. Define and give examples of Arrhenius, Bronsted-Lowry, and Lewis acids and bases. (20.3)
9. Use the Bronsted-Lowry theory to classify substances as acids, bases, conjugate acids, and conjugate bases. (20.3)
10. Predict products and write equilibrium reactions for aqueous solutions of Bronsted-Lowry acids and bases. (20.3)
11. Identify strong and weak acids and bases including oxyacids. (20.4)
12. Use the extent of ionization and the K_a or K_b to distinguish between strong and weak acids and bases. (20.4)
13. Calculate an acid dissociation constant (K_a or K_b) from concentration measurements, pH measurements, or % dissociation. (20.4)
14. Complete and balance a neutralization reaction (21.1)
15. Perform calculations involving acid-base reactions (21.1)
16. Explain the steps of a titration (21.1)
17. Calculate the gram equivalent mass of any acid or base (21.1)
18. Use the concept of hydrolysis to explain why aqueous solutions of some salts are acidic or basic. (21.2) *Pre-AP only*
19. Define a buffer, and show with equations how a buffer system works. (21.2) *Pre-AP only*
20. Calculate concentrations of ions of slightly soluble salts. (21.2) *Pre-AP only*
21. Use Le Chatlier's principle to explain the common ion effect. (21.2) *Pre-AP only*
22. Calculate the solubility product constant (K_{sp}) of a slightly soluble salt. (21.2) *Pre-AP only*

