

CH 221 Chapter Four Part 2 Study Guide

- Understand what an electrolyte is. Know the differences between strong electrolytes, weak electrolytes, and non-electrolytes. Be able to give examples of each category.
- Be able to predict the solubility of ionic compounds in water. Be able to recognize what types of ions are created upon dissolving ionic compounds or acids and bases in water. Know how to predict the products of precipitation reactions by looking at the cations and anions.
- Define acids and bases and know their characteristic behavior towards each other. Be able to recognize acid-base equations. Memorize the names of the common acids and bases.
- Understand the differences between strong and weak acids *and* strong and weak bases. Memorize the neutralization reaction and know when it applies. Understand that the net ionic equation for the reaction of a strong acid and strong base will *always* be $\text{H}^+_{(\text{aq})} + \text{OH}^-_{(\text{aq})} \rightarrow \text{H}_2\text{O}_{(\text{l})}$. Know how to calculate the pH of a solution with a strong acid. Know how to find $[\text{H}_3\text{O}^+]$ from the pH value.
- Know the general formula for combustion reactions, including anticipated products and reactants. Be able to recognize precipitation reactions and gas-forming reactions. Know the importance of H_2CO_3 . Understand net ionic equations and be able to derive them from normal chemical equations.
- Be able to give the oxidation number of any element or compound. Oxidation numbers are *very important* for many chemical systems.
- Know the definitions of reduced, oxidized, reducing agent and oxidizing agent. Be able to recognize an oxidation-reduction reaction.
- Define molarity, solute, solvent and solution. Know how to calculate molarity, volume and moles if only two of the three quantities are known.
- Understand the importance of dilution in the chemistry laboratory. Know how to utilize the formula $\mathbf{M}_1\mathbf{V}_1 = \mathbf{M}_2\mathbf{V}_2$ (also known as $\mathbf{c}_1\mathbf{V}_1 = \mathbf{c}_2\mathbf{V}_2$). Be able to derive this equation from moles₁ and moles₂ if required.
- Be able to solve stoichiometric problems using solution concentrations and volumes. Explain how a titration is performed. Understand the significance of standardization. Know the definitions for indicators and the equivalence point. Be able to calculate concentrations or amounts of reactants using titration data.
- Be able to solve and understand the assigned problems in problem set #4 and #5.