Exam 4 Study Guide

Chapter 10

- Hydration reaction – predict the product(s) given the reactants
- Role of enzymes in biochemical reactions
- Relate physical properties (boiling point and solubility) of alcohols to their structure
- Recognize chiral carbons in molecules
- Predict the products formed when an alcohol is dehydrated
- Identify thiol and phenol functional groups in organic compounds and relate the physical properties of thiols and phenols to those of alcohols and alkanes

Chapter 11

- Recognize and identify oxidation and reduction reactions that involve hydrocarbons
- Classify alcohols as primary, secondary or tertiary;
    - predict the product of the oxidation of an alcohol
    - predict the product of the reduction of an aldehyde or ketone
- Relate physical properties of aldehydes and ketones to their structure (boiling point & solubility)
- Predict the product of oxidation and reduction reactions that involve thiols
- Predict the product of oxidation of aldehydes and relate the physical properties of carboxylic acids to aldehydes, alcohols and alkanes
- Describe in general terms the role of the common redox coenzymes in biological oxidation reduction reactions (oxidize or reduce?)

Chapter 12

- Predict the products for the reactions of organic acids with water and with bases
- Recognize primary, secondary and tertiary amines and relate the structure of amines to their physical properties
- Predict the products for the reactions of amines with water and with acids; recognize the zwitterion form of molecules that contain both acid and amine groups
- Recognize the structures of organic acids and bases as they exist under physiological conditions

Chapter 13

- Predict the products of the condensation of two alcohols
- Predict the products of the condensation reactions that form esters and amides
- Predict the structures of polymers that are formed by the condensation reactions
- Predict the products of hydrolysis reactions of ethers, esters and amides
- Understand the effect of physiological buffers on the structures of the products of a hydrolysis reaction and predict the products of a saponification reaction
- Describe the role of ATP cycle in metabolism and predict whether ATP is formed or broken down in a reaction

Additional material

- Isomers
    - Develop structures of constitutional isomers given a molecular formula
    - Develop cis / trans isomers given the name of a compound
    - Identify constitutional vs cis / trans isomers
- Predict the type of intermolecular force (dispersion, dipole-dipole, hydrogen bonding) given a structure and the impact on physical properties