

## Chem. 218 Important Concepts, Exam 3

### Ch. 15.7-15.8

Spin-spin coupling  
coupling

complex splitting patterns (ex. dd, dt, ddd, etc)

### Ch. 21: Aldehydes and Ketones: Nucleophilic Addition

Nomenclature

Synthesis of hemiacetals, gem-diols (hydrates), acetals

Synthesis of imines and enamines

Hydrolysis of hemiacetals, gem-diols, acetals, imines and enamines

Synthesis of cyanohydrins

Nucleophilic addition to nitriles

Wittig, Horner Emmons

Olefin metathesis

### Ch. 22: Carboxylic Acids and Derivatives

Nomenclature

Nucleophilic Acyl Substitution

Conversion of acid chlorides  $\rightarrow$  anhydrides, acids, esters, amides

Conversion of anhydrides  $\rightarrow$  acids, esters, amides

Conversion of esters  $\rightarrow$  acids

Conversion of carboxylic acids into:

Acid chlorides ( $\text{SOCl}_2$ )

Anhydrides (heat)

Esters ( $\text{H}^+$ , ROH)

Amides (DCC)

Nitriles

Hydrolysis

Nucleophilic addition ( $\text{H}^-$ , R-Li, R-MgX)

### Ch. 28: Amino Acids and Proteins:

Generic structure of amino acids

Generic structure of peptides

Solid phase peptide synthesis

### Ch. 23

Keto-enol tautomerization

Formation of enolates

Thermodynamic and kinetic enolates

Halogenation

Alkylation of enolates