

## CHEM 243 STUDY GUIDE for EXAM #1

**Exam: Thursday, April 30.**

The exam will be over chapters 16 and parts of 10, 12, 15 and 17  
The best items to study and review are in-class assignment #1 and the problem sets #1 and #2 posted on the web sites.

Also study these problems from the text :

Chap 12 #37, 70a,b

Chap 15 #25, 26

Chap 16 # 7a,b, 9, 10,13, 14,15, 19-22, 24, 26, 28, 30, 31, 48, 53a, 58, 57, 62

Chap 17 #5-10, 13, 14

The most important sections for chap 16: 16.5--16.15, 16.17, 16.22 (ATP only).

For chap 17: 17.1—17.4, 16.6

For chap 10: 10.12 (Grignard only)

For chap 12: 12.18, 12.19

For chap 15: 15.9, 15.10 (Azo dye reaction)

Know and be able draw the arrow pushing **mechanism** for these reactions:

Electrophilic Aromatic Substitution (in making Azo dyes, sec 15.10),

Nucleophilic acyl substitutions

Acid catalyzed ester & amide hydrolysis, Fisher esterification, trans esterification

Hydroxide promoted ester hydrolysis

Nucleophilic addition to aldehyde/ketone with Grignard reagents (sec 17.4)

Be able to recognize the following functional groups: Aldehyde, Ketone, Carboxylic acid, ester, acid anhydride, amide and acyl halides.

Know the relative reactivities of the carbonyl compounds—which are most likely to undergo acyl substitution reactions.--Predict reaction products of acyl chlorides and acid anhydrides with alcohols, amines and water.

Know how Sodium Borohydride and Lithium Aluminum hydride react with aldehydes, ketones, esters, amides and acids (you do not need to know the mechanism) (sec 17.6)

Know how Grignard reagents are formed and how they react with aldehydes, ketones, esters, amides and acids.

Know how Soap is formed (sec 16.14)

Be able to recognize the structure of ATP and how it can activate an acyl group (sec 16.22)

Predict if a compounds would be a dye/colored. Be able to identify the **chromophore** and **Auxochrome** of a dye. Know the relationship of conjugation and wavelength of light absorbed (sec 12.18)