

CHEM 243 STUDY GUIDE for EXAM #2

Exam: Thursday, May 21st **Extra Office hours:** On Wednesday May 20th. I will have office hours from 11 am- 1 pm (in my office) I will also be at the Zoka coffee shop on Blakeley st (near u-village) from 7-8:30 am on Thursday..

The exam will be over selected sections of chapters 17, 18, and 19. The best items to study and review are in-class assignment #2, problem set (on website) and problem from the text (listed on the chem. 243 web page).

Sections to focus on: Chap 17: 17.8-17.10, 17.16. **Chap 18:** 18.1, 18.2, 18.8, 18.9, 18.11-18.15, 18.17-18.20. **Chap 19,** 19.1, 19.2, 19.3, 19.5 (KMnO₄ only)

Reactions (& mechanisms) to Know:

Formation of an imine from a carbonyl and a primary amine (know mechanism)

Formation of enamine from carbonyl and secondary amine (know mechanism)

Acetal and Ketal formation and hydrolysis of acetals and ketals (know the mechanism)

Michael reaction enolate attack of unsaturated carbonyl sec 18.11. (know mechanism)

Alkylation of carbonyls using LDA 18.8, 18.9 & 18.14. Know structure of LDA

Aldol Addition and dehydration (aldol condensation). (know mechanism)

Claisen Condensation (know mechanism).

Intramolecular condensations, (Know mechanisms) sec18.17

Decarboxylation of 3-oxocarboxylic acids 18.18 (know mechanism)

Malonic Ester synthesis 18.19 (know mechanisms of all steps)

Reduction of carbonyls with hydrogen 20.1—you do not need to know the mechanism

Oxidation of alcohols & aldehydes using sodium dichromate. 19.2 & 19.3 You do not need to know the mechanisms.

Hydroxylation of Alkenes using potassium permanganate sec 19.5. You do not need to know the mechanism. Do know the stereochemistry of the reaction.

Misc

Acidity of the alpha Hydrogens of carbonyls. 18.1 Understand (K_a values) of table 18.1 on pg 851. Know when an acid will be completely deprotonated by hydroxide ion or LDA.

Enol Tautomers 18.2. Be able to draw an enol of an aldehyde or ketone.

Mechanism. I will have a question showing some 'faulty' mechanism steps mixed in with legitimate one—be able to tell the difference and not the erroneous step.

Oxidation states: Be familiar with the various oxidation states of Carbon (see chart on pg 909). Which states are high potential energy (fuels) and which are low potential Energy. Know if a certain reaction is an oxidation or a reduction of the organic compound (e.g a ketone being converted to an alcohol is a reduction)

Intramolecular aldol reactions. Be able to draw the cyclization product of a dicarbonyl compounds undergoing an intramolecular aldol condensation