

Review Sheet – CH 254, Exam #2

The exam will cover Chapters 14 and 15, parts of 12 and 13, and section 16.1.

Chapter 12 Topics

Basic Spectroscopy

- Be able to do a SODAR calculation

UV-Vis Spectroscopy

- Understand that UV-vis absorptions are caused by electronic transitions (HOMO→LUMO) and what the most common transitions are ($n \rightarrow \pi^*$; $\pi \rightarrow \pi^*$)
- Be able to interpret basic UV-vis spectra (understand the effects of conjugation on λ_{max})
- Know the color wheel
- Know the Beer-Lambert Law and be able to perform the associated math

Chapter 13 Topics

Be able to interpret a ^1H NMR spectrum and come up with a reasonable structure; show your work!

Combined Spectroscopy

Given a combination of various sorts of spectral data, be able to come up with a reasonable structure; show your work!

Chapter 14 Topics

Understand the concept of aromaticity.

Know Hückel's Rule.

Be able to classify compounds as aromatic, antiaromatic, or nonaromatic, and explain why.

Be able to name aromatic compounds with multiple substituents.

Mechanisms:

Electrophilic aromatic substitution (all types)

Other Reactions:

Alkylation with a Gilman reagent

Clemmensen reduction

Wolff-Kishner reduction

Side-chain reactions – NBS; reduction of a nitro group; oxidation of an alkyl group

Chapter 15 Topics

Mechanisms:

Reaction of amines with nitrous acid (primary, secondary, tertiary)

S_NAr

Benzyne formation and reaction

Other Reactions:

Replacement of diazonium group with various other groups

EAS with diazonium ion as electrophile (formation of an azo compound)

Chapter 16 Topics

Nomenclature of carboxylic acids, diacids, acid salts, esters, anhydrides, amides, and nitriles