

SPRING, 2002
Tentative Lecture Outline

DATE	TOPIC	PROBLEMS
Mar. 25	Chapter 9 Synthetic Uses of Substitution and Elimination Reactions	Read pp. 345-392 Problems: 1-7, 8acd, 13, 14, 15a, 16-31, 32c-h, 33c-r, 34a-i, 35, 37, 38, 42. Due on April 8.
Mar. 27	continue	
Mar. 29	continue	
Apr. 1	continue	
Apr. 3	continue	
Apr. 5	Chapter 10 Additions to Carbon- Carbon Double and Triple Bonds	Read pp. 401-452 Problems: 1, 2, 3abdef, 4bcd, 5-7, 9bc, 10, 11, 13-15, 17bd, 18, 19bc, 22-26, 27abd, 28-32, 34, 35, 37, 44, 45. Due on April 17.
Apr. 8	continue	
Apr. 10	continue	
Apr. 12	continue	
Apr. 15	Chapter 12 Structure Determination by Spectroscopy I: Infrared and Nuclear Magnetic Resonance Spectroscopy	Read pp. 497-587 Problem Set A: 5, 6, 8bcdef, 9, 11, 12bcd. Due on April 26.
Apr. 17	EXAM 1	Chapters 9 and 10
Apr. 19	continue Chapter 12	
Apr. 22	continue	
Apr. 24	continue	Problem Set B: 14, 15bcdef, 16abef, 17, 18, 19bcdef, 20bcdef, 21-27, 29, 30, 34, 36, 37-40. Due on May 8.

Apr. 26	continue	
Apr. 29	continue	
May 1	continue	
May 3	continue	
May 6	Chapter 13 Structure Determination by Spectroscopy II: Ultraviolet-Visible Spectroscopy and Mass Spectrometry	Read pp. 608-627 Problems: 10-14, 18-27. Due on May 10.
May 8	Chapter 11 Functional Groups and Nomenclature II	Read pp. 461-492 Problems: 1-4, 7-12, 14, 15, 19-23. Due on May 17.
May 10	EXAM 2	Chapters 12 and 13
May 13	Continue Chapter 11	
May 15	Chapter 14 Additions to the Carbonyl Group	Read pp. 635-682 Problems: 1, 2, 4-6, 7abd, 8-10, 12, 13, 15-28, 37, 41. Due on May 31.
May 17	continue	
May 20	continue	
May 22	continue	
May 24	continue	
May 29	continue	
May 31	EXAM 3	Chapters 11 and 14
June 3	Review	
June 4	FINAL EXAM 8:00 - 9:45	Cumulative

Schedule of Laboratory Experiments Spring Quarter, 2002

Week of Mar. 25

Experiment 1 An Oxidation-Reduction Scheme

Read pp. 266-277 in your lab text. Do Experiment 28. This is a two-week experiment. Do Part A during the first week and Part B during the second week. Determine the percentages of borneol and isoborneol by gas chromatography.

Week of Apr. 8

Experiment 2 Bromination of Stilbene

Read pp. 409-412 in your lecture text. The procedure for this experiment is available on Blackboard.

Week of Apr. 15

Experiment 3 Catalytic Hydrogenation

Read pp. 244-248 in your lab text. Do Experiment 25.

Week of Apr. 22

Experiment 4 Unknown Identification by Spectroscopy

There is no pre-lab for this experiment. You will be given two unknown samples. You will identify one of them using its IR spectrum. You will use both the IR and ^1H -NMR spectra of the other compound to identify it. The report for this experiment is due during the week of Mar. 6.

IR Unknown: You will be given an unknown compound from the list below. Obtain the IR spectrum of your unknown and identify it. The report should contain an interpretation of the IR spectrum and the reasons behind your identification of the unknown.

t-butanol
benzyl alcohol
ethyl acetate
ethyl benzoate
acetophenone
3-pentanone
benzophenone
acetic acid
benzoic acid
toluene

benzene
o-nitrotoluene
cyclohexane
nitrobenzene
aniline
p-nitroaniline
cyclohexylamine
benzonitrile
acetonitrile
benzaldehyde

IR/NMR Unknown: You will be given an unknown from the list below. Obtain an IR and a NMR spectrum of your unknown. The report should contain a complete interpretation of both the IR and NMR spectra.

Aldehydes

2-methylpropanal
4-nitrobenzaldehyde
(E)-3-phenyl-2-propenal
(cinnamaldehyde)

Acids

diphenylacetic acid
1,4-butanedioic acid
(succinic acid)
propanoic acid
(E)-2-butenic acid
(crotonic acid)

Amines

4-methylaniline
dibutylamine
triethylamine

Esters

ethyl formate
ethyl acetate
methyl butyrate
3-methylbutyl acetate
methyl benzoate
diethyl phthalate
methyl m-nitrobenzoate
2-propenyl acetate

Ketones

3-methyl-2-butanone
3-pentanone
3,3-dimethyl-2-butanone
(pinacolone)
2,5-hexanedione
propiophenone
(ethyl phenyl ketone)
acetophenone
(methyl phenyl ketone)
4-heptanone

Alcohols

2-isopropyl-5-methylphenol
(thymol)
ethanol
3-methyl-1-butanol
2-phenylethanol
E-3-phenyl-2-propene-1-ol
2-propanol
2-propen-1-ol
1-propanol
benzyl alcohol
(phenylmethanol)
diphenylmethanol
(benzhydrol)

Week of Apr. 29

Experiment 5 The Addition of HBr to Unsymmetrical Alkenes

Read pp. 403-408 in your lecture text. The procedure for this experiment is available on Blackboard. Work with a partner. Each person should use a different one of the two alkenes, 3-propen-2-one (methyl vinyl ketone) or phenylethene (styrene). Obtain a ^1H -NMR spectrum of your product. You should discuss the regiochemistry of addition to both alkenes in your report.

Experiment 6 Identification of Unknowns by Gas Chromatography-Mass Spectrometry

Read pp. 608-627 in your lecture text. The procedure for this experiment is available on Blackboard. No prelab is required. The report for this experiment is due during the week of May 13.

Week of May 6

Experiment 7 Oil of Cloves

Read pp. 135-143. Do Experiment 13A.

Week of May 13

Experiment 8 The Grignard Reaction

Read pp. 292-299. Do Experiments 31 and 31A. This is a two-week experiment.

Week of May 28 Finish any experiments, clean up, and check out.

You must check out of the lab at this time or you will receive an incomplete in the lab. (Monday, May 27, is Memorial Day, so the Monday section should check out on June 3.)