

Chem 0310, Winter 2009
Professor Dennis P. Curran
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Final Exam, Study Summary

Monday, April 20 4:00 PM – 5:50 PM, Room 12 CSC

*The final will be comprehensive and cover Chapters 1-13.
Over the last quarter of the course, the **material in Chapter 12 is most important.***

Final Grade Basis

Highest of two of three semester exams:	200 points
Highest ten of thirteen quizzes	100 points
Final Exam	<u>200 points</u>
Maximum Total	500 points

Chapter 11: Alkenes

Naming alkenes; E/Z descriptors from CIP priorities. (26, 27, 46)

Structure and NMR features (Section 11-4)

Stability of double bonds and heats of hydrogenation (45)

Preparation of alkenes by E2 elimination (mechanism, regioselectivity, stereoselectivity), and by dehydration of alcohols (mechanism) (47–58)

IR and MS will *NOT* be covered

REACTIONS 11.1–11.5

Chapter 12: Alkene Addition Reactions

Reactions of alkenes:

Ionic additions of HX. Mechanism. Markovnikov's rule. Regioselectivity. Stereochemistry. Hydration of alkenes. Mechanism. What favors hydration or dehydration?

Hydrogenation of double bonds (conditions, products, stereochemistry).

Bromination of alkenes. Mechanism (bromonium ions). Stereochemistry in cyclic (ring) and acyclic (chain) systems. Formation of halohydrins. Regioselectivity. (26)

Oxymercuration/Reduction (conditions, products, mechanism of oxymercuration but not reduction).

Hydroboration/Oxidation (conditions, products, mechanism).

Oxidative Cleavage of Alkenes (ozone, OsO₄ and KMnO₄); reactions only.

Formation and opening reactions of epoxides (oxiranes). Formation of syn and anti diols.

(OVER)

Radical addition of HX to alkenes and radical polymerization.

REACTIONS 12.1–12.11, and 12.13-12.18 (28–45)

NOT covered: carbenes, polymerization

Chapter 13: Alkynes

Structure and names of alkynes (21, 22); NMR and IR spectra (not covered in class)

Acidity of Alkynes, Alkylation of terminal alkynes

Preparation of alkynes by HX elimination

Reactions of alkynes

Catalytic hydrogenation and Li/NH₃ reductions of alkynes (stereochemistry).

Mechanisms of these reactions will *not* be tested. Oxidation of alkynes

Electrophilic additions, Hydroboration

REACTIONS 13.1–13.12 (30-39)

Practice some multi-step synthesis problems; 12.37, 38, 55; 13.34, 39, 40