

CHM 2210 Final Review

hybridization and geometry of orbitals
(pp 11-17, example 1.3, problems 1.10 and 1.13)

polar covalent bonds and net dipole moments
(pp 34-8, example 2.1, problem 2.6)

resonance and delocalization
(pp 42-8, examples 2.2 and 2.3, problems 2.9 and 2.10)

geometric isomerism of alkenes (cis/trans and E/Z)
(pp 111-3 and 229-233, examples 4.1 and 7.1, problems 4.5 and 7.13)

stereochemistry of alkanes and cycloalkanes (pp 126-7, examples 4.2 and 4.3)
conformations and diagrams, axial / equatorial
torsional (eclipsing), steric (gauche and diaxial), and angular

nomenclature of organic compounds (pp 87-92, 109-11, 224-8, 314-5, 345-7)
find parent (has all possible pi bonds)
number carbons (1 is nearest to substituent)
name substituents (put in alphabetical order)

radical halogenation of alkanes
(pp 187-8 and 347-53, example 10.1, problems 10.5 and 10.7)
alkyl and allyl free-radicals
initiation, propagation, and termination

polar reaction mechanisms (pp 194-9, example 6.2, problem 6.8)
energy diagram (pp 205-9, example 6.4)
intermediate
transition states
activation energy

alkene reactions (pp 301-3)
halogenation and bromonium (pg 266)
create alcohols (Markovnikov / non-Mark., pg 272)
carbene addition
other additions
oxidative cleavage
catalytic hydrogenation
allylic radical halogenation (pp 347-53)

alkynes prep'n and reactions (pp 280-1) (or pp 266-8 6th ed)
elimination of 1,2-dihalides and vinyl halides
addition of HX and X₂ (w/ 2° vinylic carbocations, pg 263)
hydration HgSO₄/H₃O⁺ (ketones) and 1)R₂BH 2)H₂O₂ w/ terminal (aldehydes)
oxidative cleavage
alkylation of acetylide anions (NaNH₂ and terminal alkyne)

chiral stereochemistry (pg 322) (or pp 305-6 6th ed)
enantiomers, diastereomers, meso compound
plane of symmetry
chiral centers
pro-chiral centers (re, si, pro-R, and pro-S)

organometallic compounds (pp 345-8) (or pp 329-332, 6th ed)
Grignard reagents (alkyl anion)
Gilman reagents (alkyl coupling)

Nucleophilic substitutions and eliminations
inversion of chirality and S_N2 transition state (pp 363-4) (or pp 347-9, 6th ed)
summaries for S_N2 (pg 371), S_N1 (pg 380), E2 (pg 386), and E1 (pg 391-2)
(pp 355, 366, 369, and 374-5, 6th ed)
(Table 11.4 and following key ideas on pp 376-7, 6th ed only)

Mass spectroscopy fragmentation patterns (pp 413-6) (or pp 399-402, 6th ed)

Characteristic IR Absorptions (pp 424-9) (or pp 408-414, 6th ed)

Chemical shifts for ¹³C (pg 448) (or pg 432, 6th ed) and ¹H (pp 457-8) (pp 441-2, 6th ed).
Also, ¹H spin-spin splitting rules (pp 462-3) (or pg 446, 6th ed)