

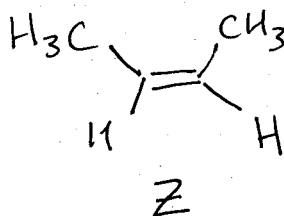
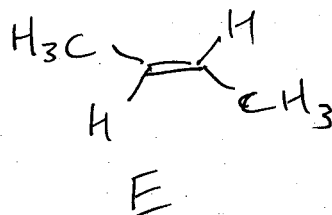
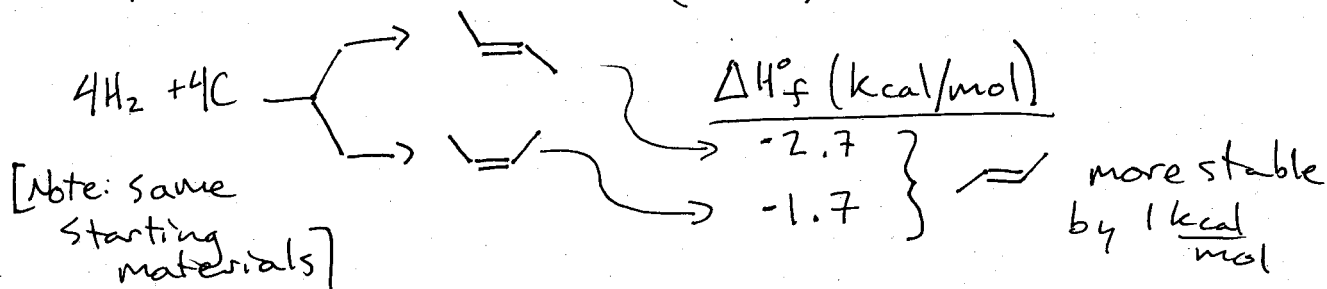
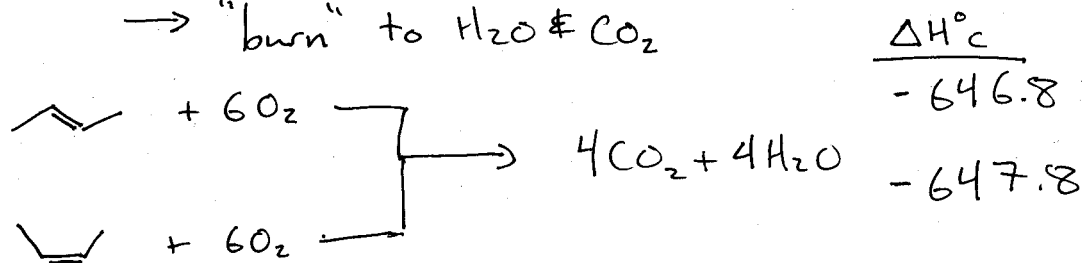
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Review Session this week & next 5:00 PM Tues B371

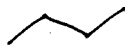
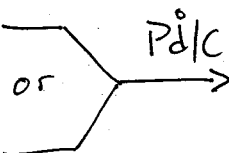
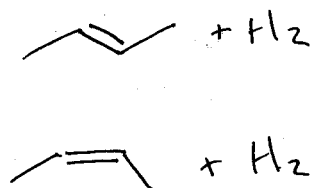
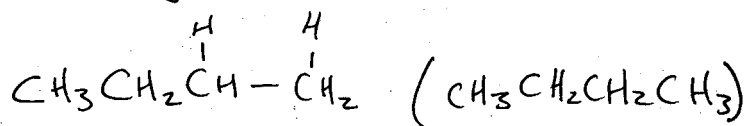
office hour today
5:00-6:00 PM

Recall: Which isomer is more stable?

① Compare heats of formation (ΔH°_f):② Compare heats of combustion (ΔH°_c)→ "burn" to H₂O & CO₂

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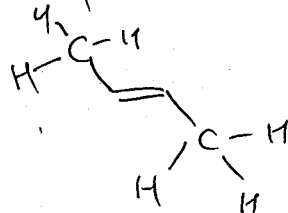
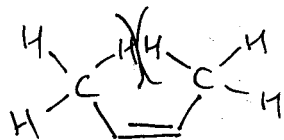
③ Heats of hydrogenation (ΔH°_h)General: Alkene + $H_2 \rightarrow$ AlkaneRequires a catalyst: Pd°/C (Pd on surface of carbon)Ex: $CH_3CH_2CH=CH_2 + H_2$ $\downarrow Pd/C$  ΔH°_h

-27.6

-28.6

} Again,
 more stable
 by $1 \frac{kcal}{mol}$

Why? Extra steric repulsion in the Z isomer



Recall gauche
 vs. anti butane
 $\sim 0.7 \frac{kcal}{mol}$

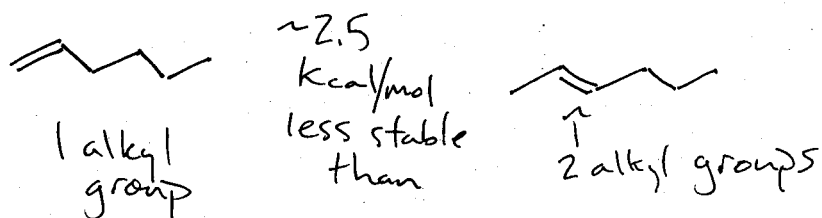
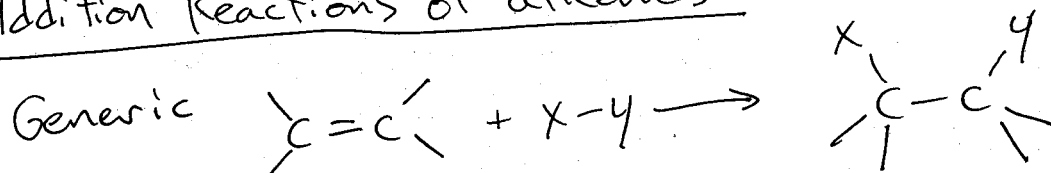
PP. 145-147

esp. Table 4.1 - Alkene energies

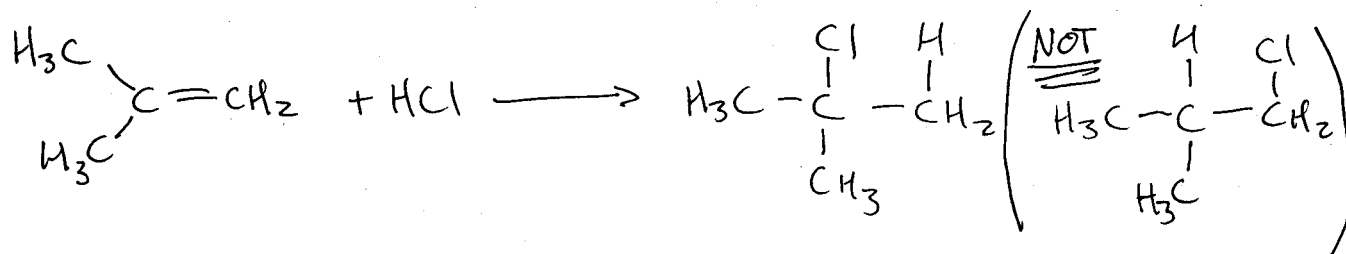
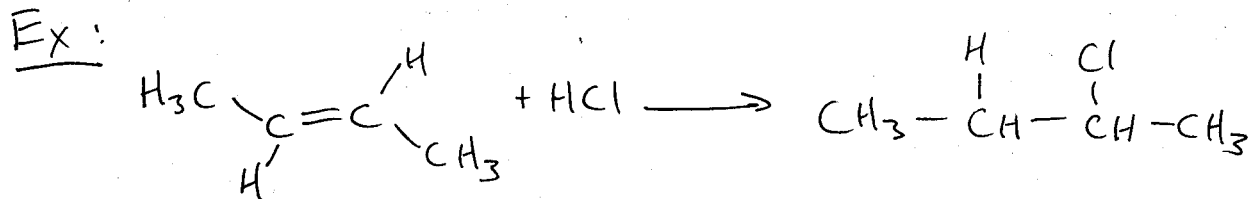
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Another trend becomes apparent:

As # of alkyl groups on sp^2 carbons increases,
stability increase (Note: compare isomers).Addition Reactions of alkenes

① Hydrogen halide additions ("HX additions")
 (eg., HCl) X is usually a halogen.



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Note:

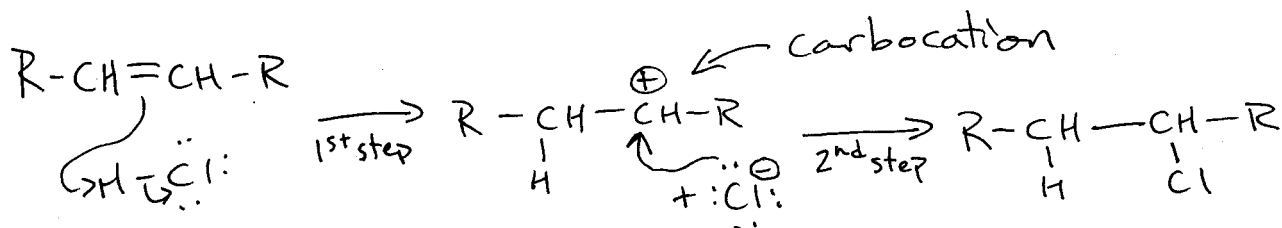
- very common reactivity pattern for alkenes
- Common for HCl, HBr, HI
- Selectivity exemplified in 2nd case is common.
I.e., for unsymmetric alkenes, X ends up on more substituted C. (Markovnikov's Rule)

General term: "Regioselectivity"

→ origin of regioselectivity?

⇒ mechanism of HX addn.

(current hypothesis to explain HX addn process).



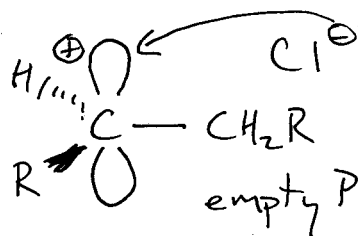
Note: This mechanism involves an "intermediate" - a transient reactive species that is created & consumed in rxn pathway.

Course Chem 343Lecturer Gellman 11AMDay MondayDate 9-26-11Notes Taken By DerekTotal # of Pages 5Submit a *Single-sided Copy* to the Office

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First step = proton transfer: Brønsted acid/base rxn
(Alkene π -bond as base)

2nd step = Lewis acid/base rxn.



Cl^- is Lewis base
Carbocation is Lewis acid.