Course CHEM 343 Lecturer Gellman

Day Wed 1:20 PM Date 11/30/11

Notes Taken By Patrick Total # of Pages 3

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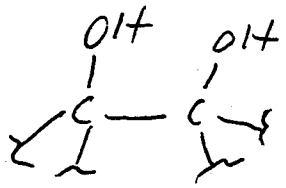
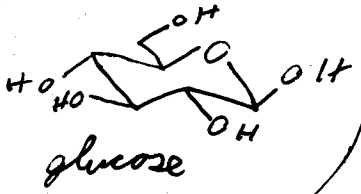
Ex 3 on Dec 5th. Same room as previous exam. Ch 8, 9, 10, 11
, note: practice exam doesn't include Ch 11

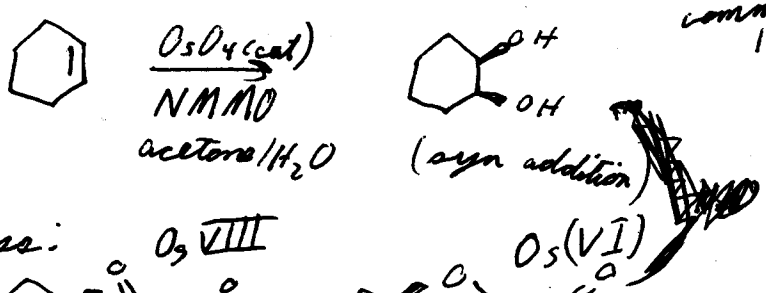
glycols or diols



(Carbohydrates:  glucose)

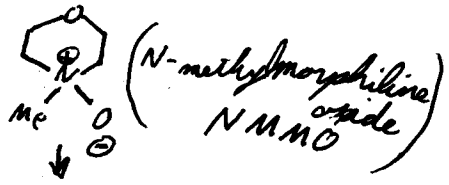
Routes to 1,2 diol from alkenes

1) OsO_4 catalyzed dihydroxylation

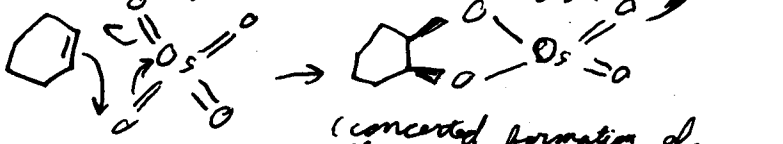
ex 

(syn addition)

comments:
1) NMNO is the stoichiometric oxidant

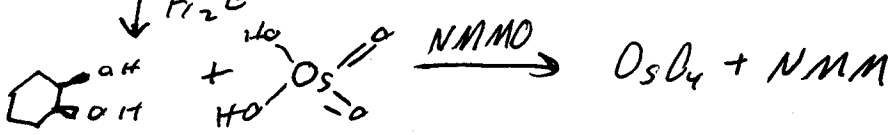


Process: O_s VIII $Os(VI)$

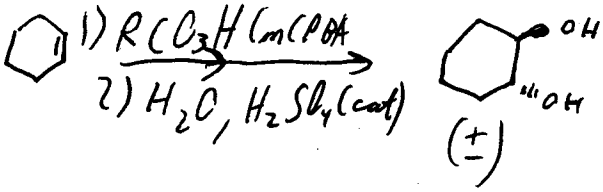


(concerted formation of this intermediate requires syn addition)

2) OsO_4 is catalytic oxidant



2) Complementary epoxidation / ring opening w/ H_2O



overall: anti addition

Note: Determine product stereochemistry via reagent choice

Read § 11.9 carefully: perspective on organic synthesis & rxn categorization

---- END Ch 11 ----

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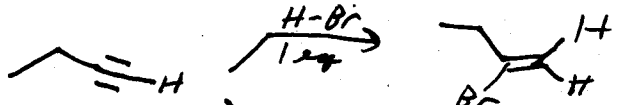
Ch 14 - alkynes ($R-C\equiv C-R'$)

Rec Problems: 7-29, 31-34, 36-39, 42-45. Read §14.1-14.2

Reactivity of alkenes - many parallels to alkene chemistry!

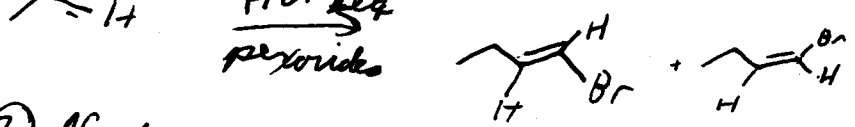
(1) HX addition



$(CH_3CH_2C\equiv CH)$ HBr 2 eq

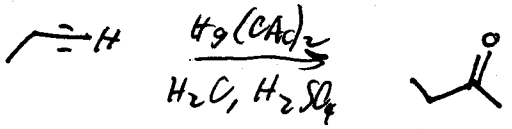
(Markonikov Product)

Note: anti-Markonikov addition under radical condition



(2) Hydration produces ketone (facilitated by Hg^{2+} $\left(\begin{matrix}OH\\ \|\\ C\end{matrix}\right)$)

ex

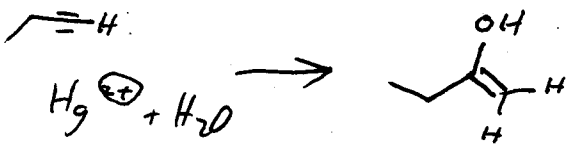


Key points:

i) Initial product is an "enol"

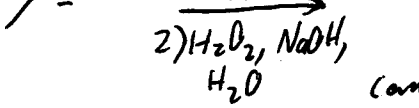
ii) No $NaBH_4$ required (C-Hg bond is transient) (see text)

Thus,



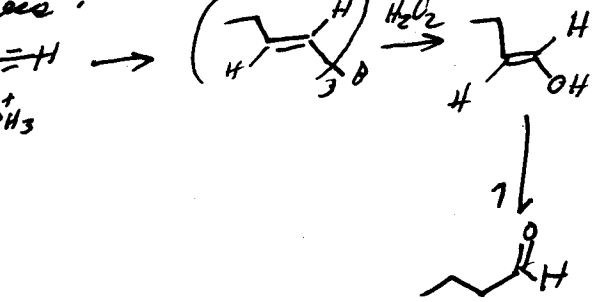
(isomer)

(3) Hydroboration / oxidation



(anti-Markovnikov product)

Process:



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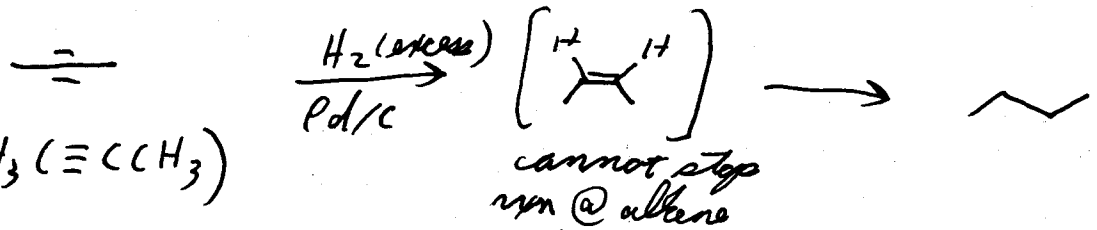
Note: Markonikov issue only applies to terminal alkynes

($R-C\equiv C-H$)

terminal

(contrary: "internal" alkynes $R-C\equiv C-R'$ ... no Markonikov selectivity possible

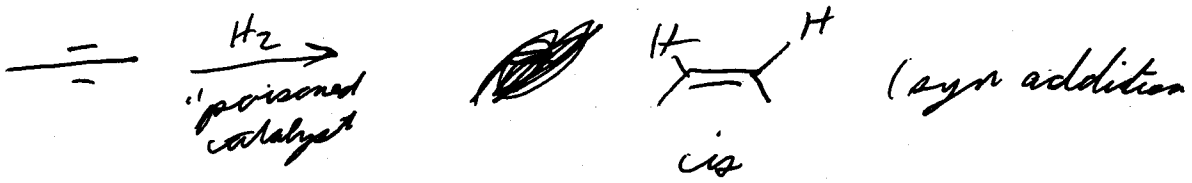
Hydrogenation



$(H_3C\equiv CCH_3)$

cannot stop rxn @ alkene w/ "typical" catalyst

"Poisoned catalyst"



cis

(syn addition