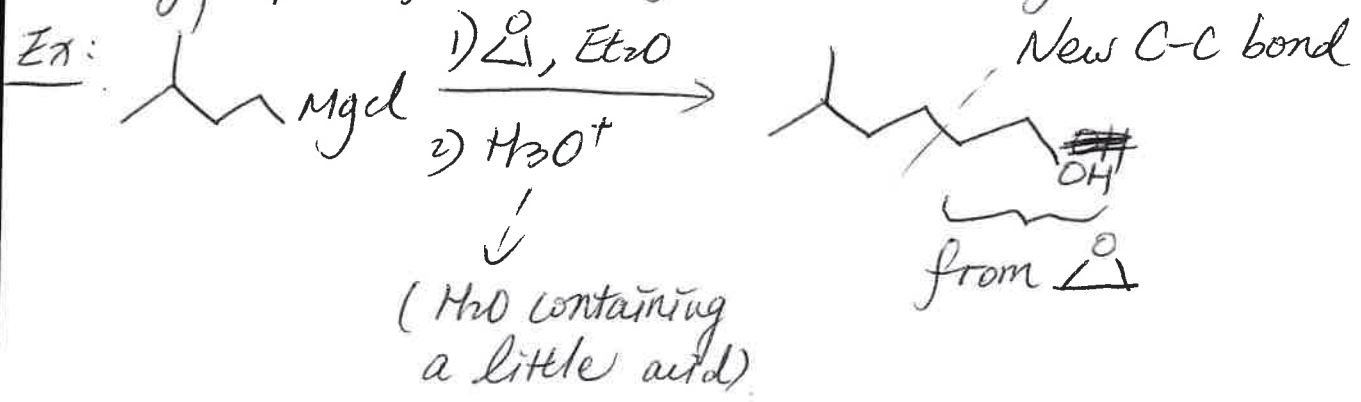
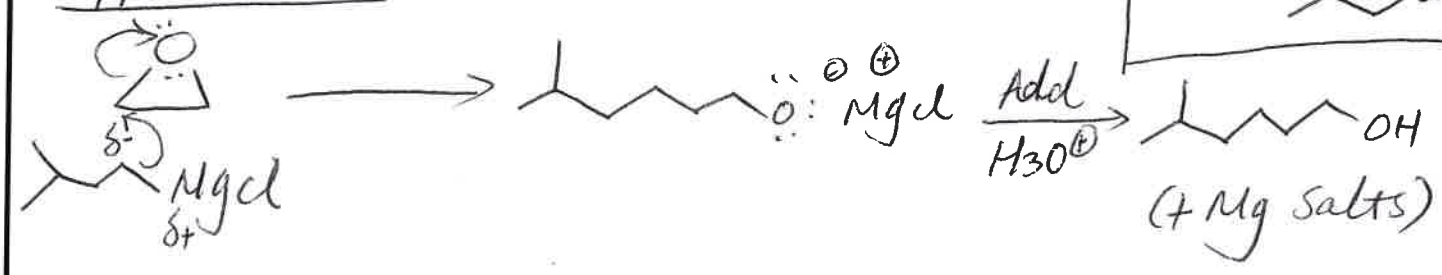


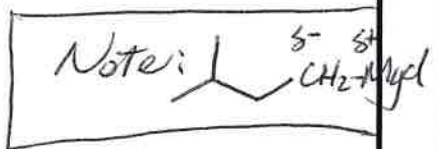
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Recall: Rxns of epoxides (w/ nucleophiles) ...
 3) Ring-opening w/ organometallic reagents.



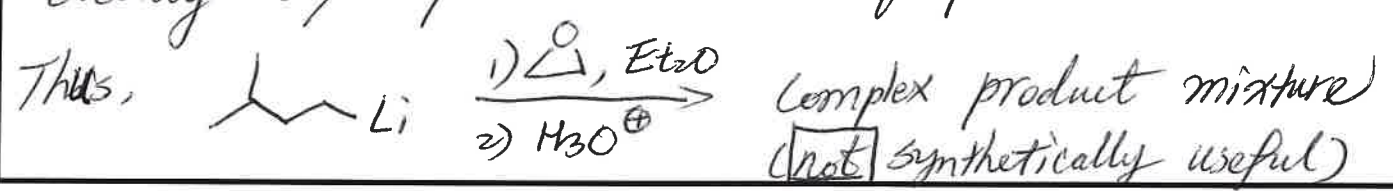
Approx. Mech-



Note: 

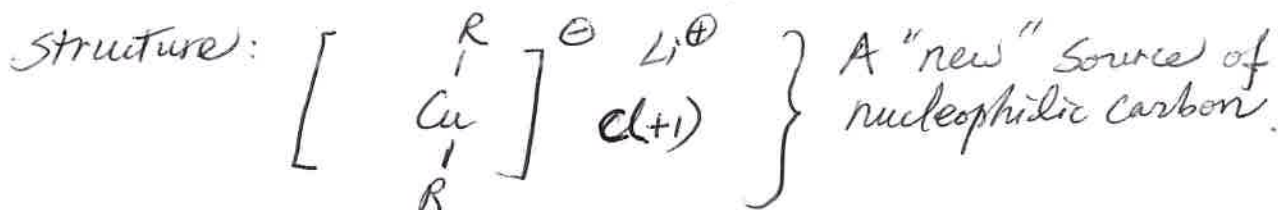
Complexity - Mg atom, from another Grignard reagent molecule, serves as Lewis acid, to enhance epoxide electrophilicity.

Recall: organolithium reagents - these do not react "cleanly" w/ epoxides - mix of products.

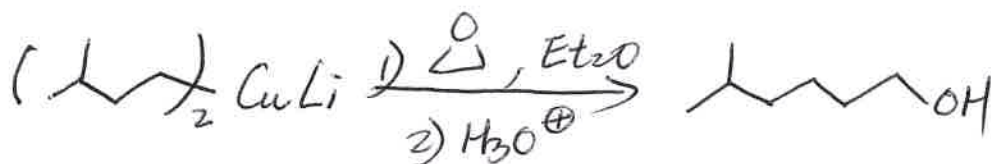


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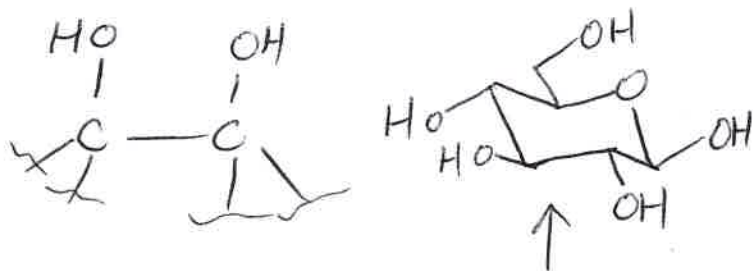
Organolithium reagents can be used to generate diorganocuprate reagents ("cuprates"), which do add productively to epoxides.



Thus,



Glycols \equiv 1,2-diols



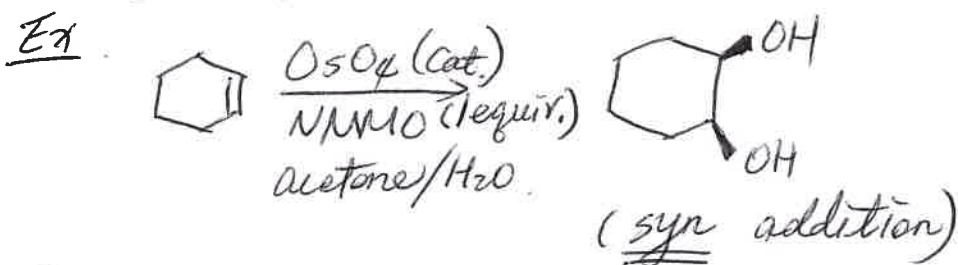
Glucose

Mindset: "cluster of functional groups"



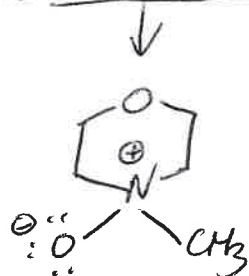
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2 methods to generate 1,2-glycol unit.
 ① OsO_4 - catalysed dihydroxylation of alkenes.



Comments

1) The stoichiometric oxidant is NMMO.

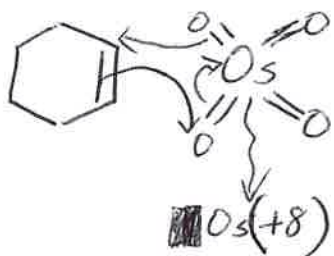


An "N-oxide"
 (Byproduct from NMMO
 reduction is NMM:)



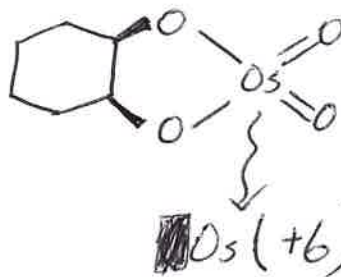
NMM \equiv
 N-methyl
 morpholine

2) OsO_4 is catalytic oxidant. Mech:



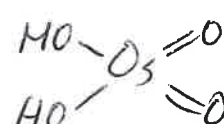
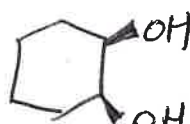
"concerted"

explains
 syn addition



H_2O

"Hydrolysis"



+ NMMO

Course Chem 343 Lecturer Gellman
Day Wednesday Date 11-25-15
Notes Taken By LL Total # of Pages 4

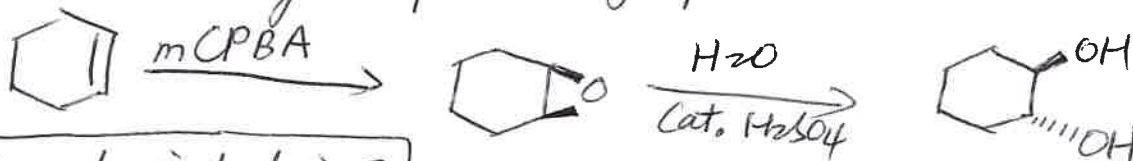
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$\text{OsO}_4 + \text{NMM} \longrightarrow$ To next rxn cycle

Note:

KMnO_4 — poor choice!

Stereochemically complementary process:



"Net"
anti.
addn

Stereochemical choice

Read § 11.10. Categorization of organic rxns from the synthetic perspective.