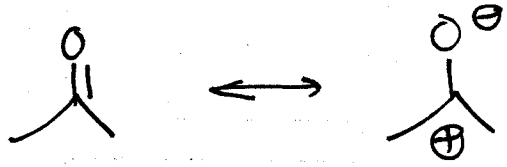
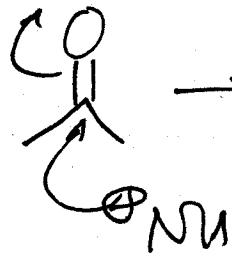
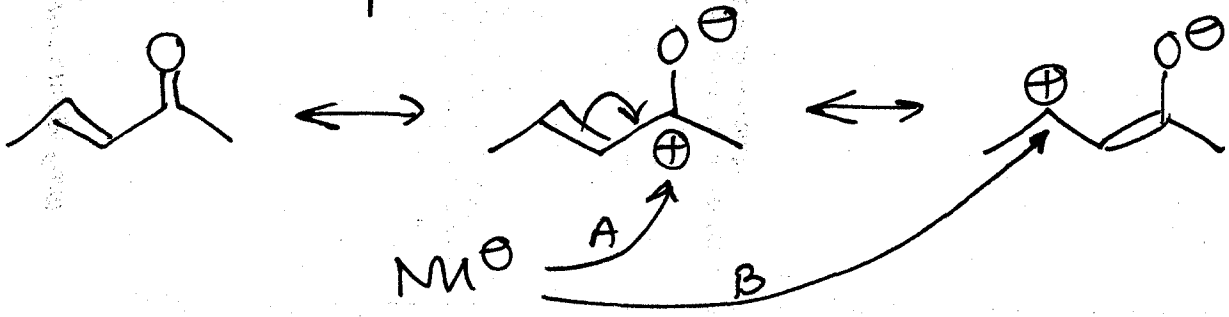
Recall: 

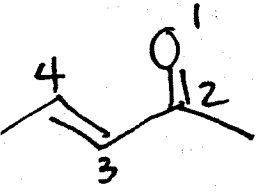
Basic rxn:  → etc.

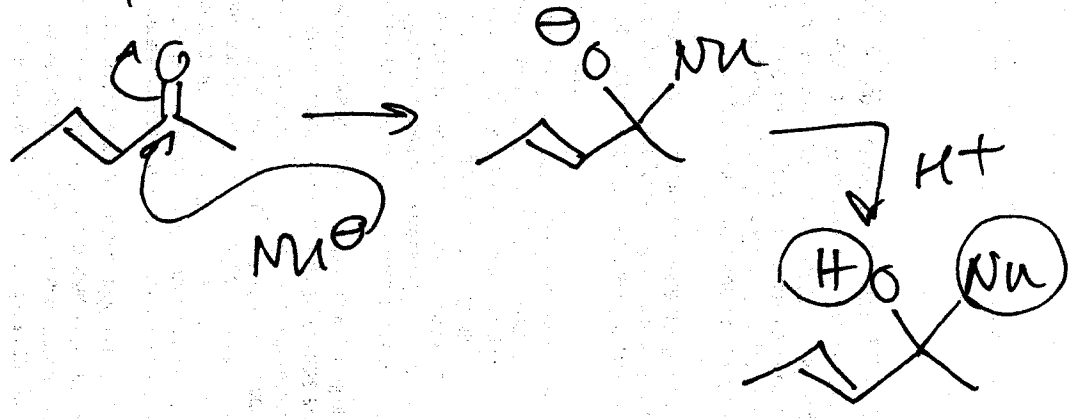
extend to α, β-unsat. C=O



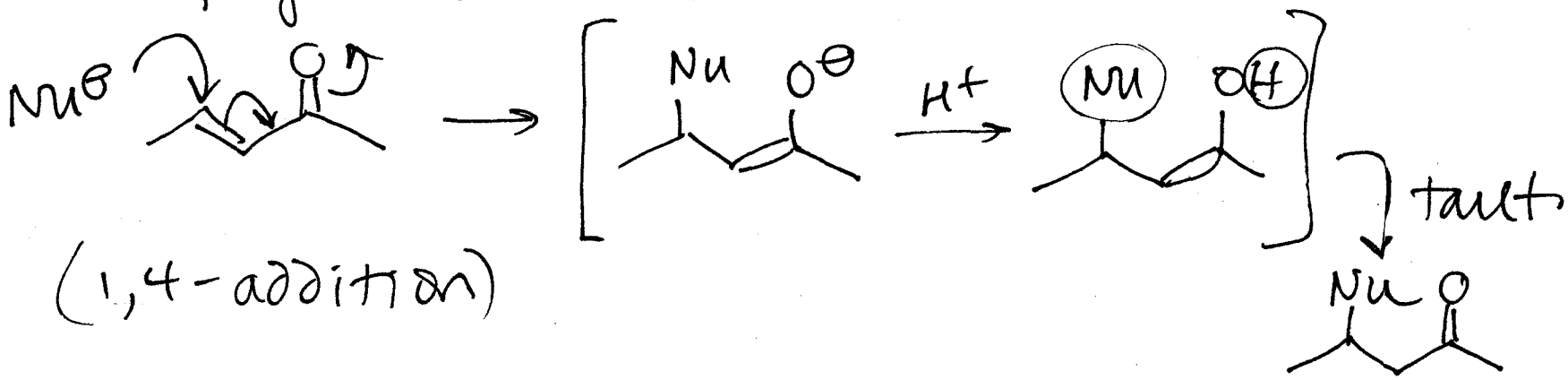
which way does the Nu react?

A: simple addition
(1,2-addition)





B. conjugate addition



(1,4-addition)

how do we know which mode the nucleophile will choose?

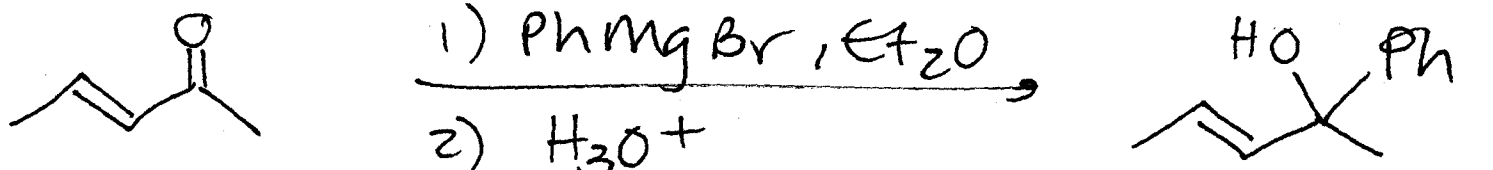
strong bases - simple addition

RMgX, $H^{\ominus}$, $-\equiv^{\ominus}$

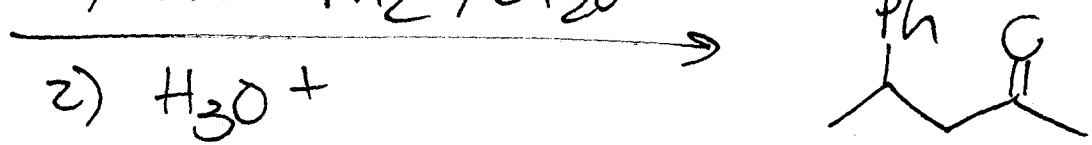
weaker bases - conjugate addition

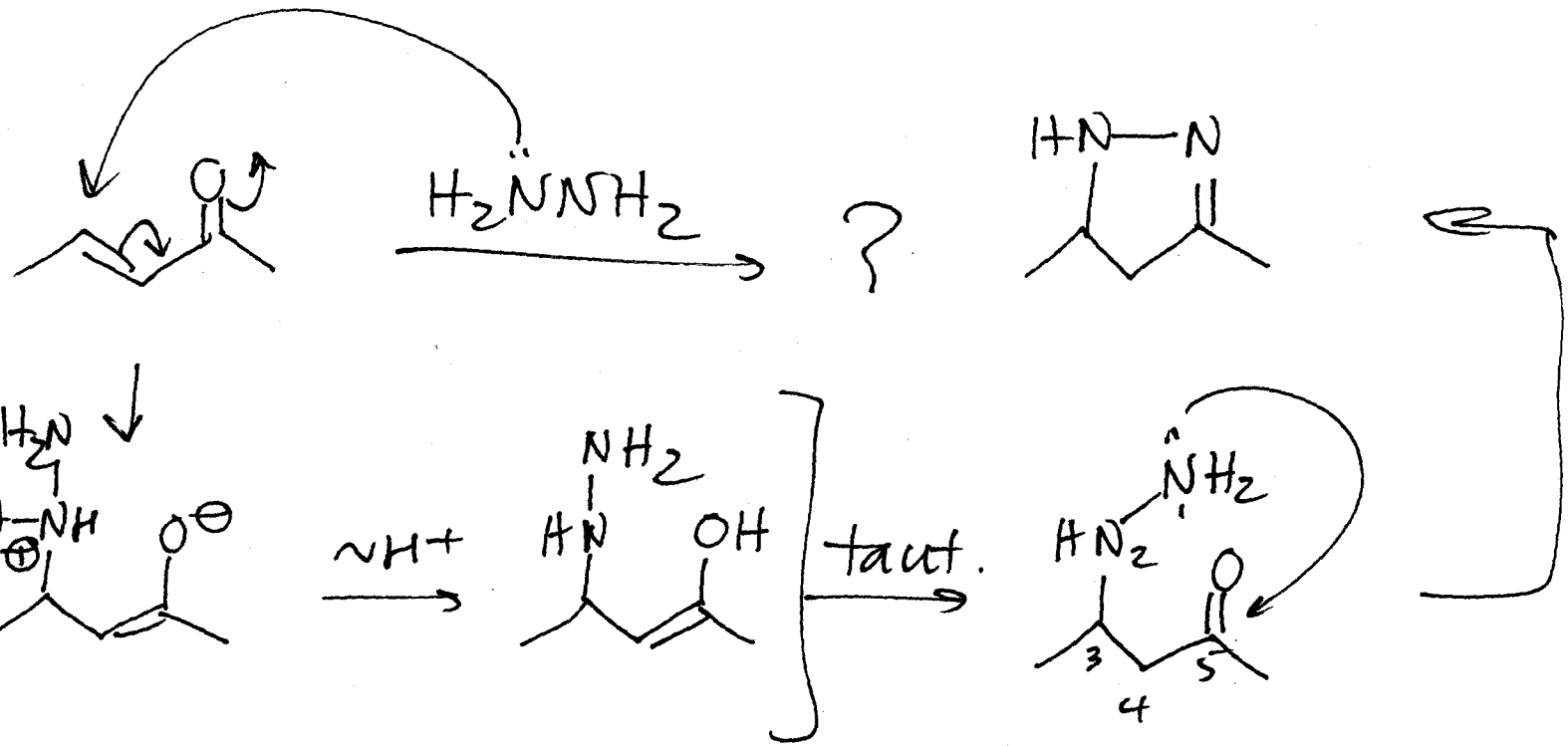
$LiCuR_2$, ROH, RNH_2, $^{\ominus}CN$, enolates

Example:



simple addition



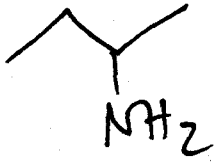


Ch. 20 - Amines

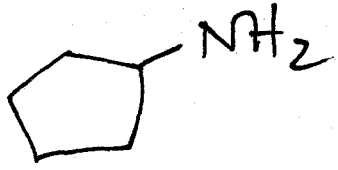
Nomenclature - NH_3 ammonia

1° amines - RNH_2 - alkanamine
- use a # to indicate location of NH_2

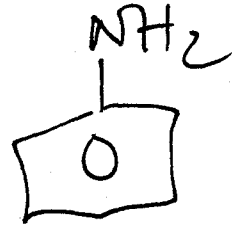
1-butanamine



2-butanamine

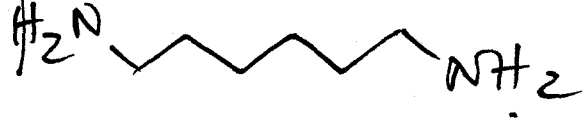


cyclopentanamine



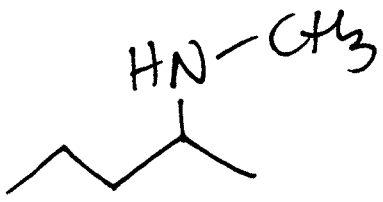
aniline

(benzanamine)

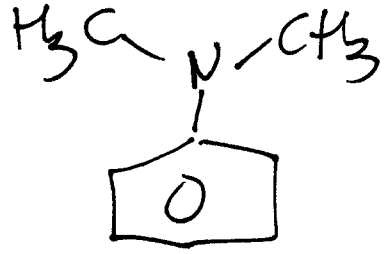


1,6 - hexanediamine

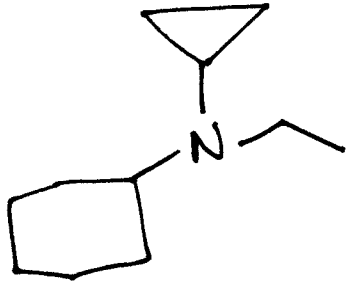
2° / 3° amines – named as N-substituted 1° amines (use the longest chain as parent name)



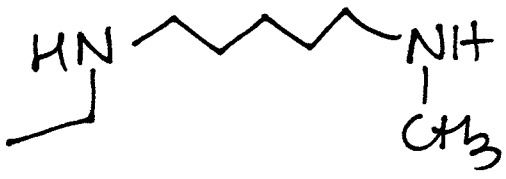
N-methyl-2-pentanamine



N,N-dimethylaniline



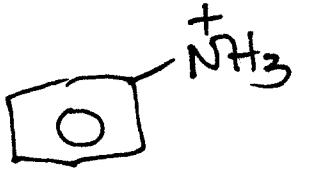
N-cyclopropyl-N-ethylcyclohexanamine



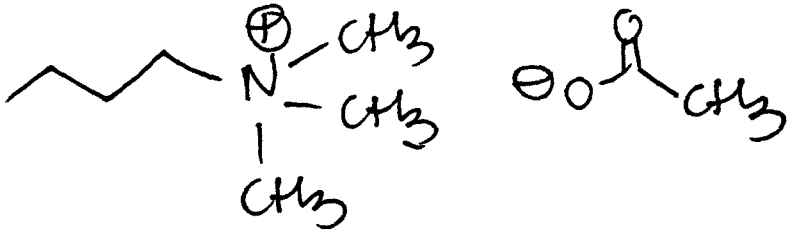
N-ethyl-N'-methyl-1,5-pentanediamine

4° ammonium salts - named like any salt
cation then anion

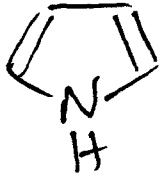
NH_4Br ammonium bromide



anilinium chloride

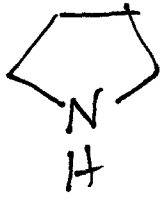


N,N,N-trimethyl butanammonium acetate

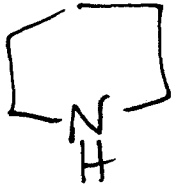


pyrrole

pyridine



pyrrolidine



piperidine

Heterocycles:

aza = N

oxo = O

thio = S

—irane = 3 membered ring

—etane = 4 membered ring

oxirane
(oxocyclopropane)

azirane
(azacyclopropane)

oxetane

azetane

thietane

etc.

alkylamines – sp^3

bond angles deviate from 109.5° depending on size of R gps.

aniline – N closer to sp^2 (can overlap w/ aromatic π system)

---

amines are polar.

alcohol > amine > alkane
(O more e⁻neg than N)

can form H bonds.