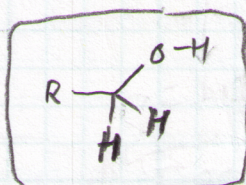
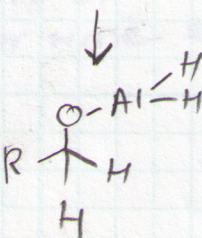
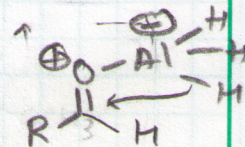
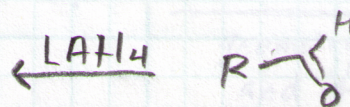
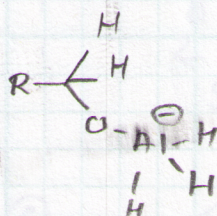
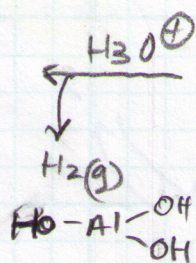
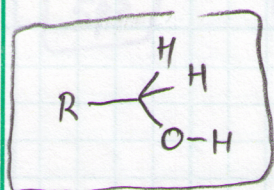
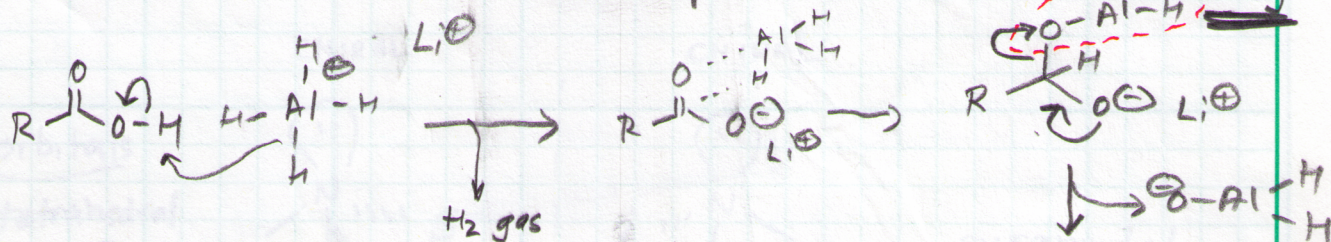


Reduction of C=O AND C=O with LiAlH_4

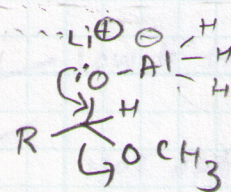
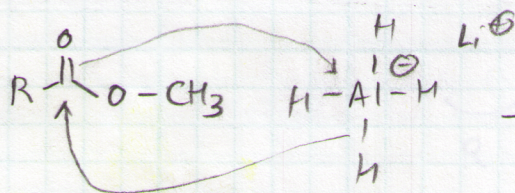


CH_3OH is a byproduct of this rxn

target

$(\text{HO})_3\text{Al}$

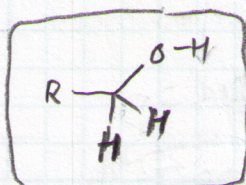
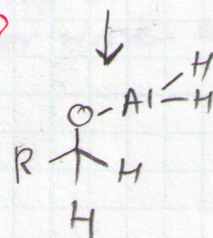
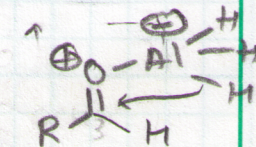
ESTER



$\text{CH}_3\text{O}^-\text{AlH}_3$

Lig.

H_3O^+



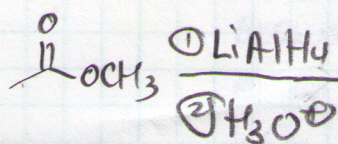
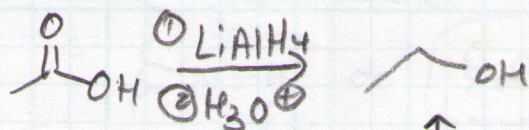
CH_3OH is a byproduct of this rxn

target

$(\text{HO})_3\text{Al}$

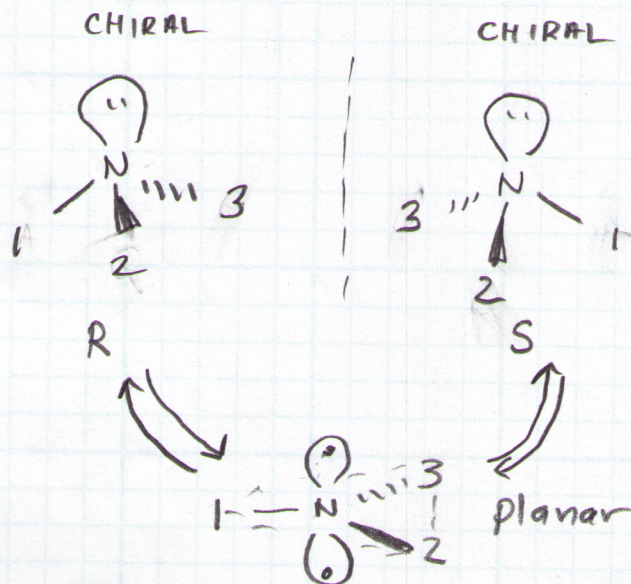
Notice the different L.g. (leaving group) in each case. that dictates the outcome of the reaction sequence

OVERALL

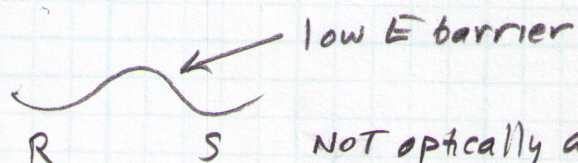


Amines

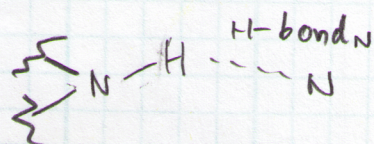
orbitals
tetrahedral
 sp^3



pyramidal
geometry of N
and its 3 substituents

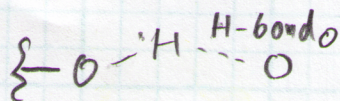


NOT optically active on
the spectrometer time scale

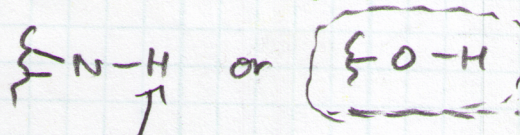


vs

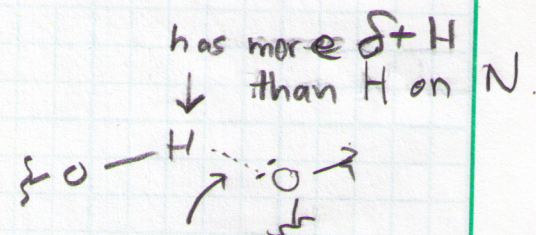
which is stronger H-bond_N
or
H-bond_O ?



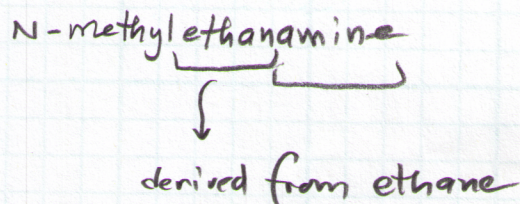
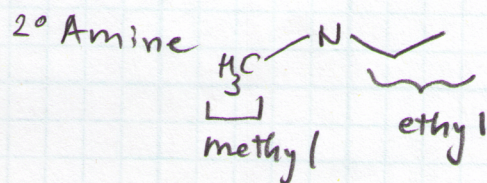
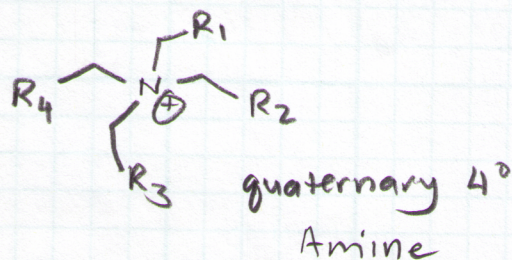
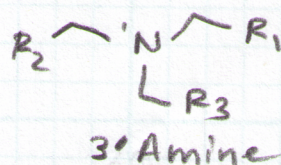
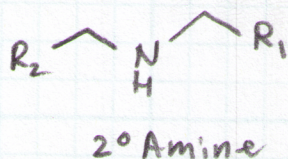
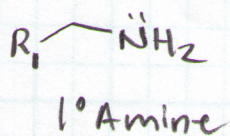
Think in terms of acidity
which is more acidic?



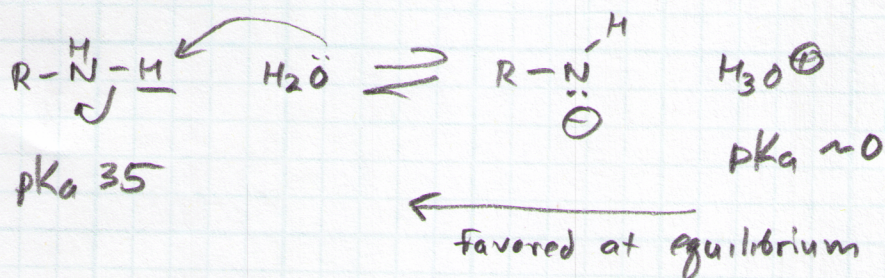
Smaller δ^+
because N share
 e^- with H better
 $\downarrow \delta^+$



THIS
H-BOND IS STRONGER

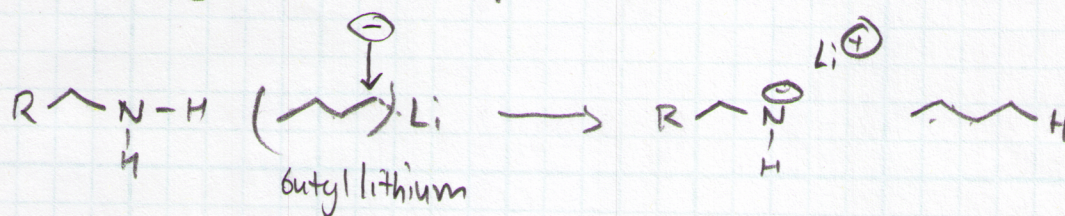


Amine pKa ~35

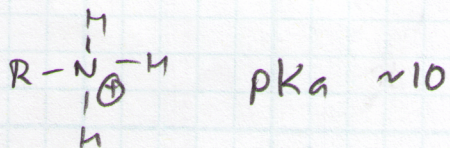
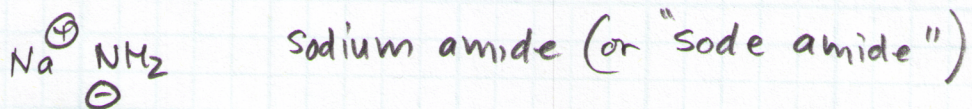
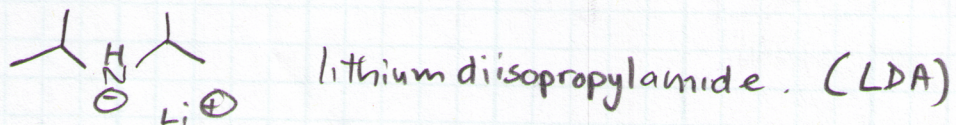
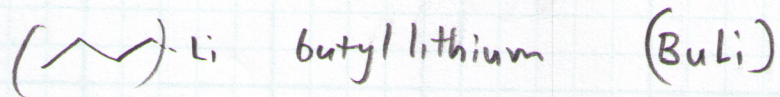


<Amines as Acids>

Need Strong bases to deprotonate!

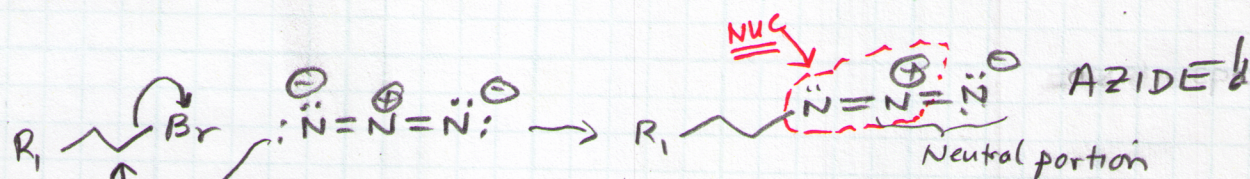
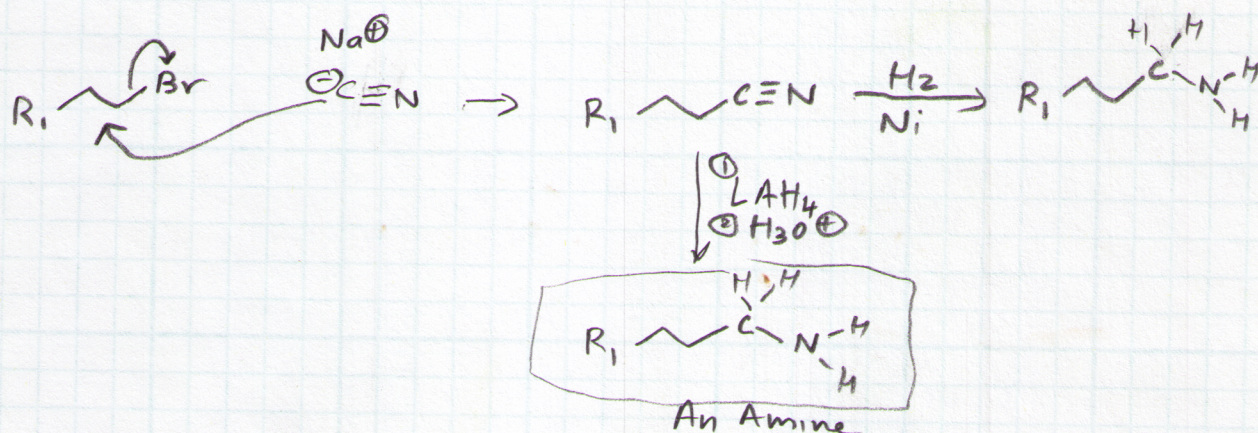
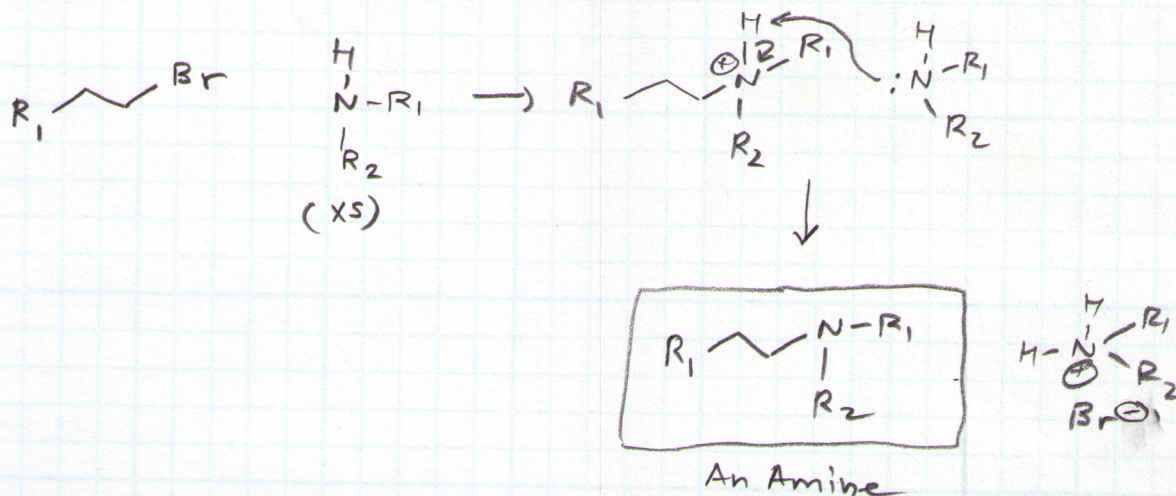


Examples of strong bases used to deprotonate amines.

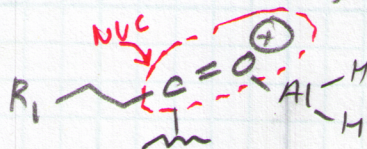


Preparation of Amines from Alkyl Halides

It should not come as a surprise that alkyl halides with their good halide leaving group are ideal for making amines, using $\text{H}_2\text{N}-\text{R}$ as a nucleophile in an $\text{S}_\text{N}2$ rxn.



Recall similarity



Similarity in Red. Nuc adds to C of $\text{C}\equiv\text{N}^+$

So, when " H^+ " from LAH adds to the azido comp above it attacks electrophilic N

