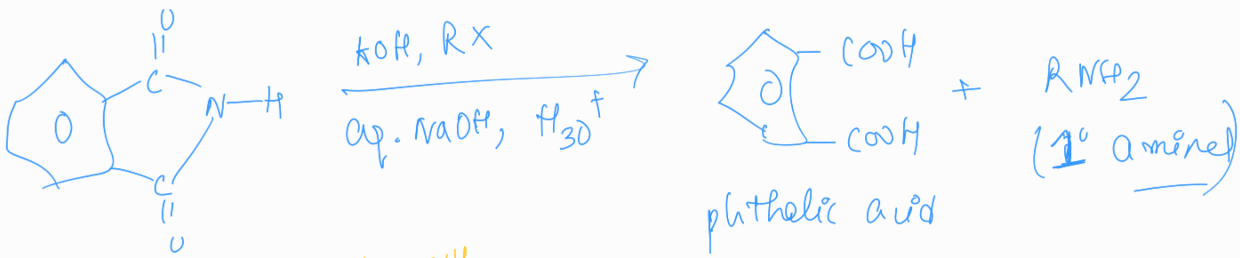
Amines

(1) $R-\overset{H}{\overset{|}{C}}=O + H_2NH \xrightarrow[-H_2O]{Heat} R-\overset{H}{\overset{|}{C}}=NH \xrightarrow[(Reduction)]{H_2/Ni/Pd} R-\overset{H}{\overset{|}{CH}}-NH_2$

NOTE :- $LiAlH_4$ and $NaBH_4$ also reduces imine
But best reagent is, $Na[BH_3CN]$ (sodium cyano-borohydride) in reductive ammonolysis.

(2) Gabriel phthalimide :-

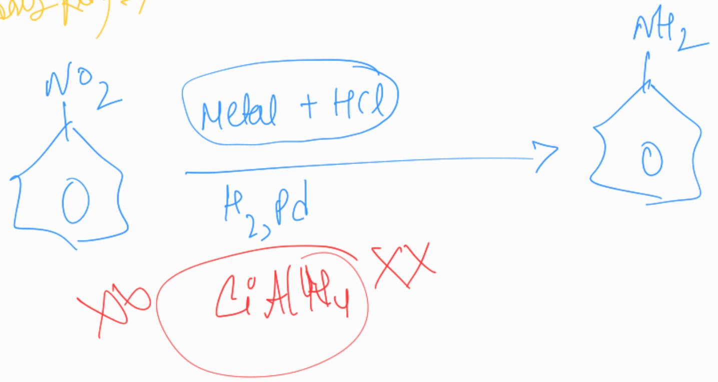
Preparation of aliphatic amines



(3) $R-C\equiv N \xrightarrow[Ni/Pd/Pt]{H_2} R-CH_2-NH_2$
or, $LiAlH_4$ — NO, $NaBH_4$

(Mendius Rxn) → $Na + C_2H_5OH$

(4)



, But, $R-NO_2 \xrightarrow[H_2, Pd \;\; LiAlH_4]{Metal\ HCl} R-NH_2$

(5) $CH_3-\overset{O}{\overset{||}{C}}-NH_2 \xrightarrow[D_2O]{Br_2/OD^-} CH_3-ND_2$

Hoffmann-Bromamide Degradation → is only for 1° amine

(6) Boiling Point → $1° > 2° > 3°$ (Amines)

(7) Basic strength of Amines :-

+I → 3° > 2° > 1° (Amine)

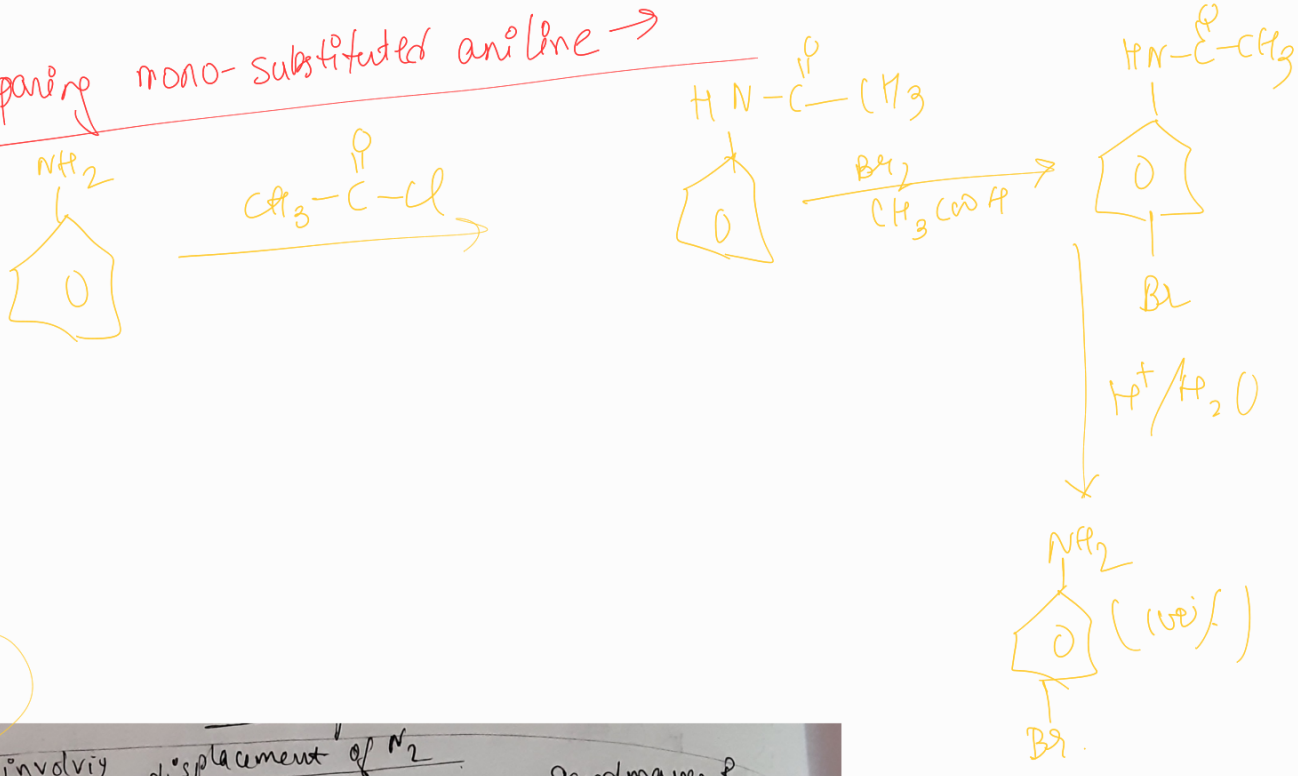
H-bonding → NH_3 > 1° > 2° > 3°

2° amine is the most basic

aq. phase → 1° > 1° > 3° ($R = CH_3$)

2° > 3° > 1° ($R \neq CH_3$)

(8) Preparing mono-substituted aniline →



(VVI)