CHAPTER

8

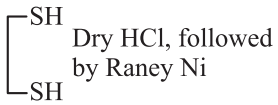
Aldehydes, Ketones and Carboxylic Acids

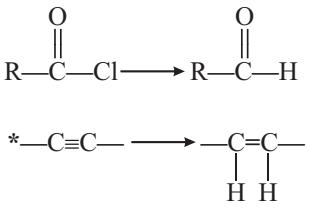
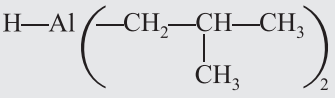
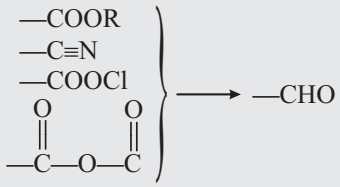
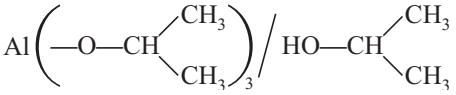
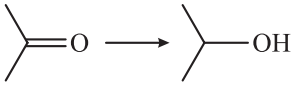
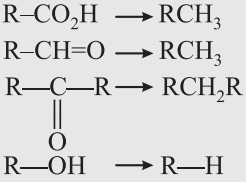
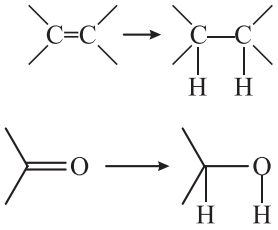
REDUCTION

Group	Product	LAH inEther	$NaBH_4$in H_2O	B_2H_6in THF	H_2/CatalystΔ
1°RX	RH	+	–	–	+
–C≡C–	–CH=CH–	–	–	+	+
>C=C<	>CH–CH<	–	–	+	+
–CHO	$-CH_2OH$	+	+	+	+
>C=O	>CH–OH	+	+	+	+
$-CO_2H$	$-CH_2OH$	+	–	+	+
$-CO_2R$	$-CH_2OH$	+	–	+	+
–COCl	$-CH_2OH$	+	+	–	+
$-CONH_2$	$-CH_2NH_2$	+	–	+	+
$(RCO)_2O$	RCH_2OH	+	–	+	+
–CN	$-CH_2NH_2$	+	–	+	+
>C=NOH	$-CH_2NH_2$	+	–	–	+

Note:

1. B_2H_6 in THF not able to reduce cyclic ester.
2. $NaBH_4$ can also reduce imine group ($\diagdown\!\!\diagup C = NH$).
3. Reactivity order towards H_2/Ni, $\Delta \Rightarrow$ —C≡N > —C(=O)—O—R

Name	Reagent	Function
Wolf Kishner Reduction	(i) N_2H_4/ (ii) KOH, Δ	
Clemmenson Reduction	Zn–Hg/HCl	
Mozingo Reduction		

Stephen's Reduction	$SnCl_2/HCl$ followed by H_3O^+	$R–C\equiv N \longrightarrow R–CH=O$
Rosenmund Reduction	H_2, Pd–$BaSO_4$	
DIBAL-H (–78°C)	 followed by $H_3O^{\oplus}$	
MPV Reduction		
Red phosphorus in presence of HI	Red P + HI	
Hydroboration Reduction	$B_2H_6/AcOH, H_2O$	
Bouvoult Blank Reduction	Na/EtOH	$R–COO–R \longrightarrow RCH_2OH + ROH$
Transfer Hydrogenation	N_2H_4/H_2O_2