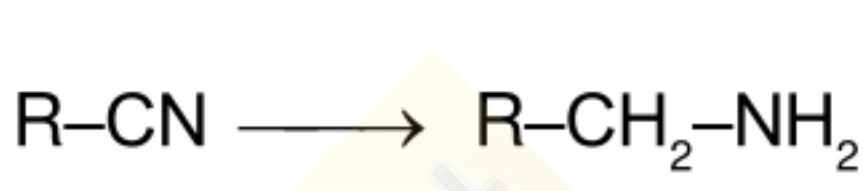
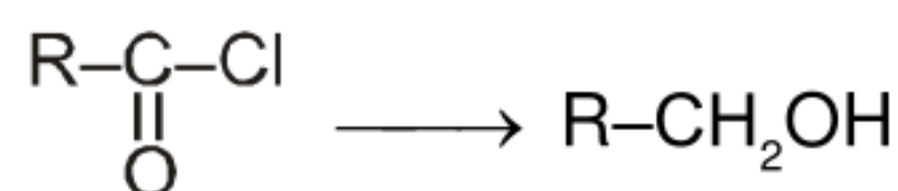
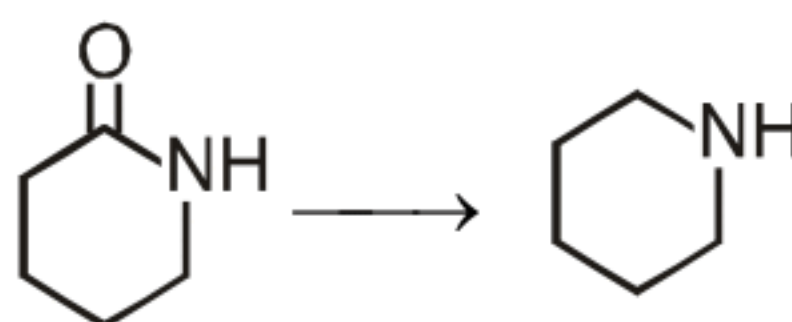
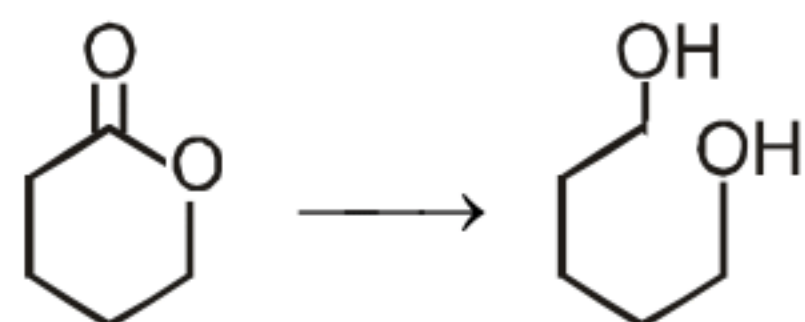
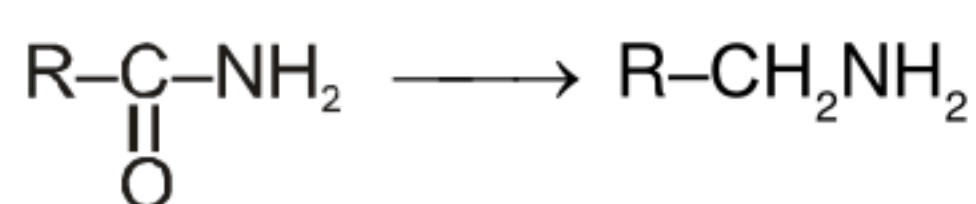
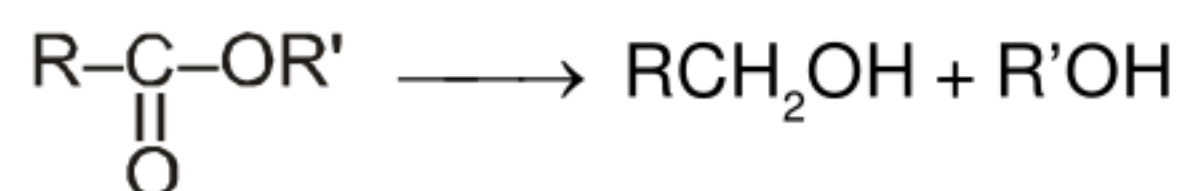
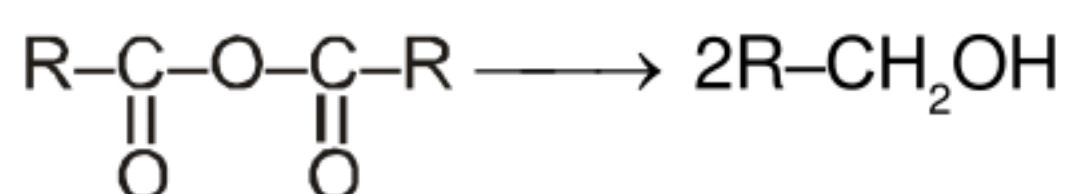
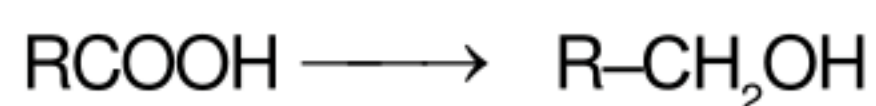
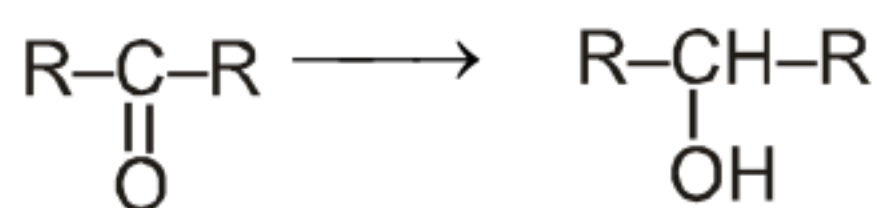
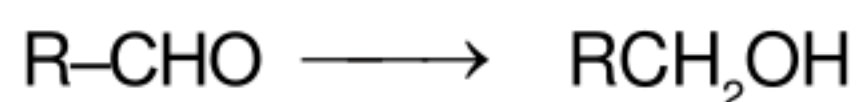


**(1)  $\text{LiAlH}_4$**



$\text{C} = \text{C} / \text{C} \equiv \text{C} \longrightarrow$  No reaction

**Exception :**  $\text{Ph-CH=CH-COOH} \longrightarrow \text{Ph-CH}_2\text{-CH}_2\text{-CH}_2\text{OH}$

**(2)  $\text{NaBH}_4$ , EtOH**

Aldehyde  $\longrightarrow$   $1^\circ$  Alcohol

Ketone  $\longrightarrow$   $2^\circ$  Alcohol

Acid halide  $\longrightarrow$   $1^\circ$  Alcohol

**(3)  $\text{Na/EtOH}$  (Bouveault Blanc reduction)**

Aldehyde  $\longrightarrow$   $1^\circ$  Alcohol

Ketone  $\longrightarrow$   $2^\circ$  Alcohol

Acid halide  $\longrightarrow$   $1^\circ$  Alcohol

Ester  $\longrightarrow$  Alcohol + Alcohol

$\text{RCN} \longrightarrow \text{RCH}_2\text{NH}_2$

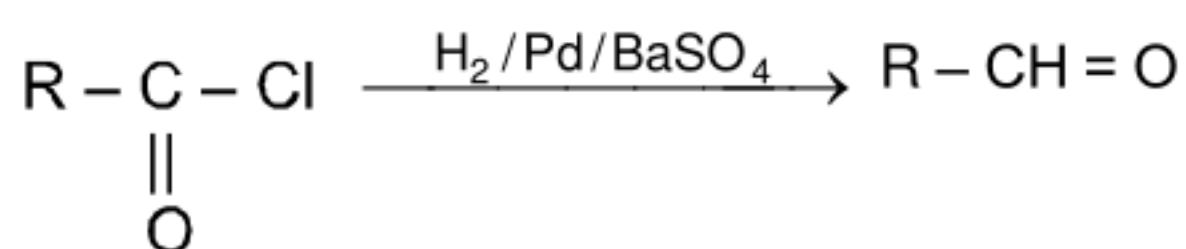
**(4)  $\text{Na-Hg/HCl}$  or**

**$\text{Al}[\text{OCHMe}_2]_3$  (MPV Reduction)**

Aldehyde  $\longrightarrow$   $1^\circ$  Alcohol

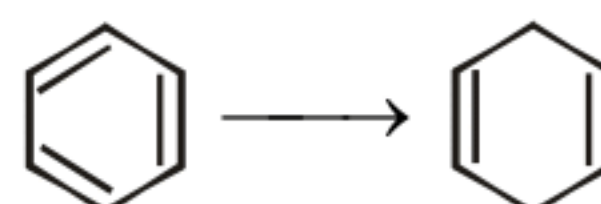
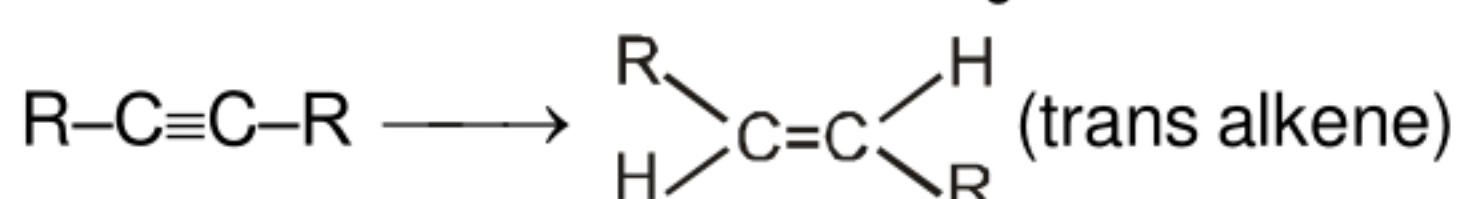
Ketone  $\longrightarrow$   $2^\circ$  Alcohol

**(5) Rosenmund's Reduction**

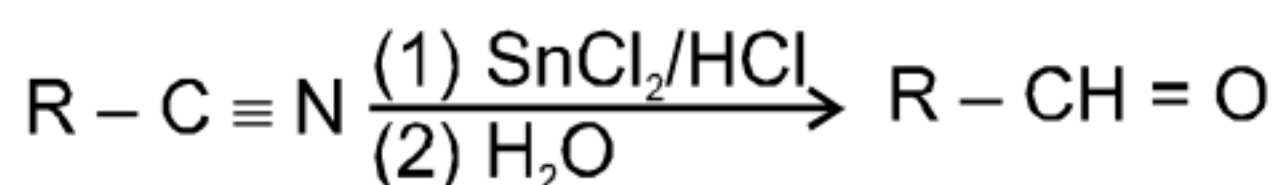


**(6) Birch reduction**

**( $\text{Li/Na/K}$  + Liquid  $\text{NH}_3$ )**

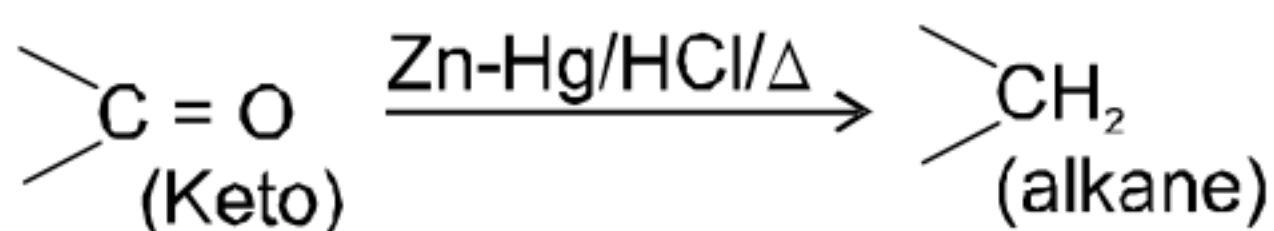


**Note :** Terminal alkynes not reduced



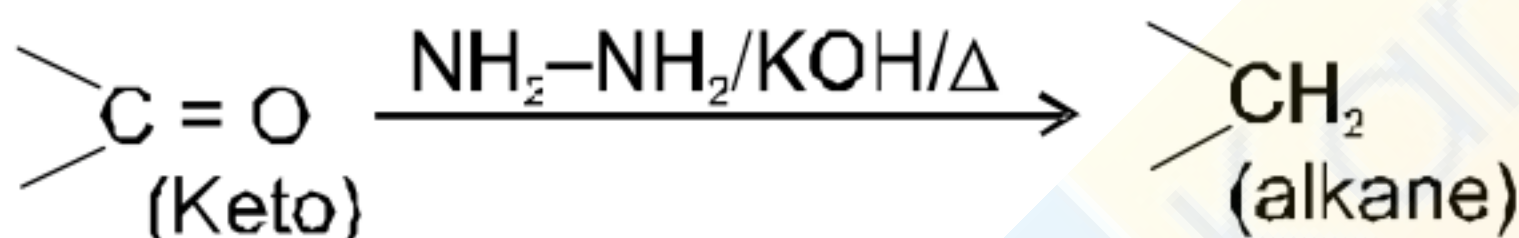
**Note :** DIBAL-H is also used for same conversion.

### (8) Clemmensen Reduction

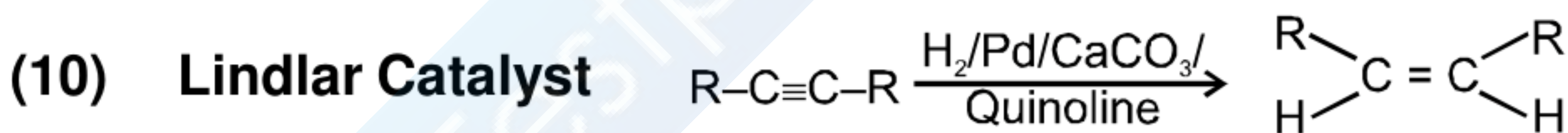


Avoid if acid sensitive groups are present in molecule.  
e.g. C=C, C≡C, OH, OR,

### (9) Wolff-Kishner Reduction



Avoid if base sensitive groups are present in molecule.  
e.g. COOR, COX, CONH<sub>2</sub>,  
-CO-O-CO-, R-X



**Note :** H<sub>2</sub>, Pd, BaSO<sub>4</sub> is also used for same conversion.

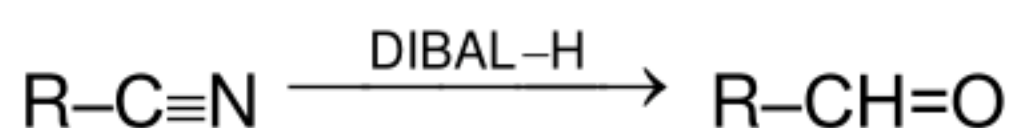
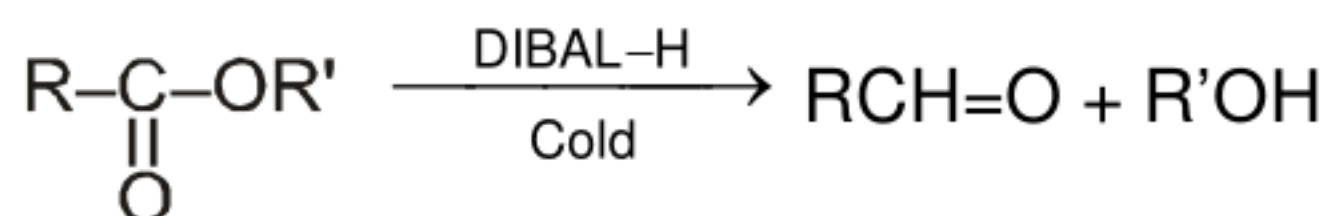
Syn addition  
(Cis alkene)

### (11) Red Phosphorus and HI

Almost all functional groups containing compounds converts into corresponding alkane by red P + HI.



### (12) DIABAL-H reduction



At ordinary temperature esters reduced to alcohols but at low temperature esters reduced to aldehyde.