

Oxidation Reaction

(1) KMnO_4 (in both medium) or $\text{K}_2\text{Cr}_2\text{O}_7$ (in acidic medium)

Aldehyde \longrightarrow Acid

1° Alcohol \longrightarrow Acid

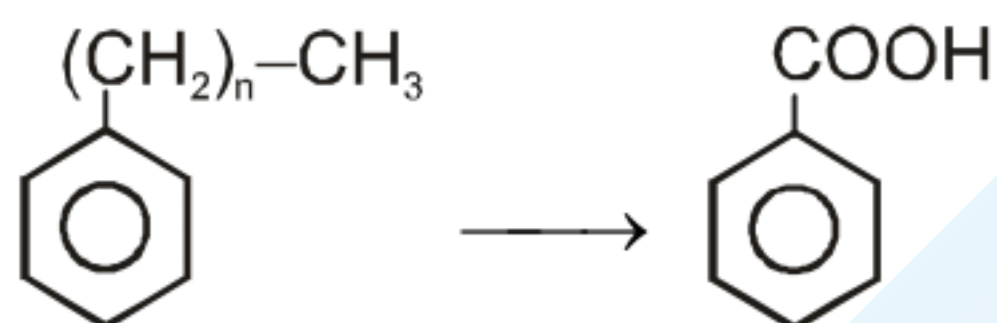
2° Alcohol \longrightarrow Ketone

3° Alcohol \longrightarrow No reaction

Alkene : $\begin{matrix} \text{R} & & \text{H} \\ & \diagdown & / \\ & \text{C}=\text{C} & \\ & / & \diagdown \\ \text{R} & & \text{R}' \end{matrix} \longrightarrow \text{R}_2\text{C}=\text{O} + \text{R}'\text{COOH}$

Alkyne : $\text{R}-\text{C}\equiv\text{C}-\text{R}' \longrightarrow \text{RCOOH} + \text{R}'\text{COOH}$

Oxidation of aromatic side chain :



**(2) PCC (Pyridinium chloro chromate)
 $\text{CrO}_3/\text{HCl}/\text{Pyridine}$**

1° ROH \longrightarrow Aldehyde

2° ROH \longrightarrow Ketone

3° ROH \longrightarrow No reaction

(3) Cu/573 K

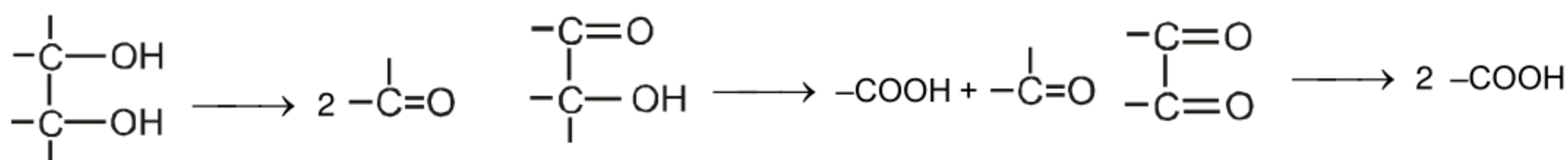
1° Alcohol \longrightarrow Aldehyde

2° Alcohol \longrightarrow Ketone

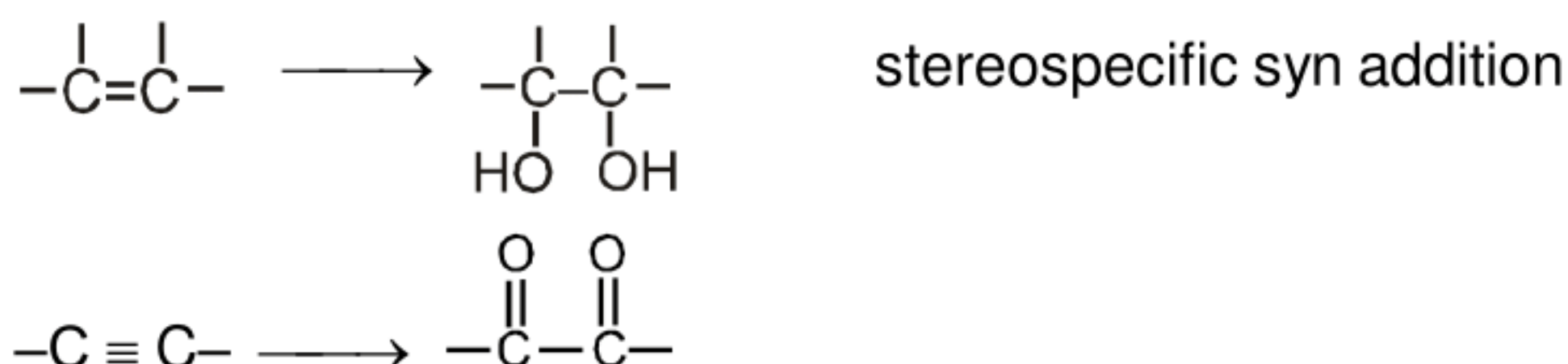
3° Alcohol \longrightarrow Alkene

(4) HIO_4 (Periodic Acid)

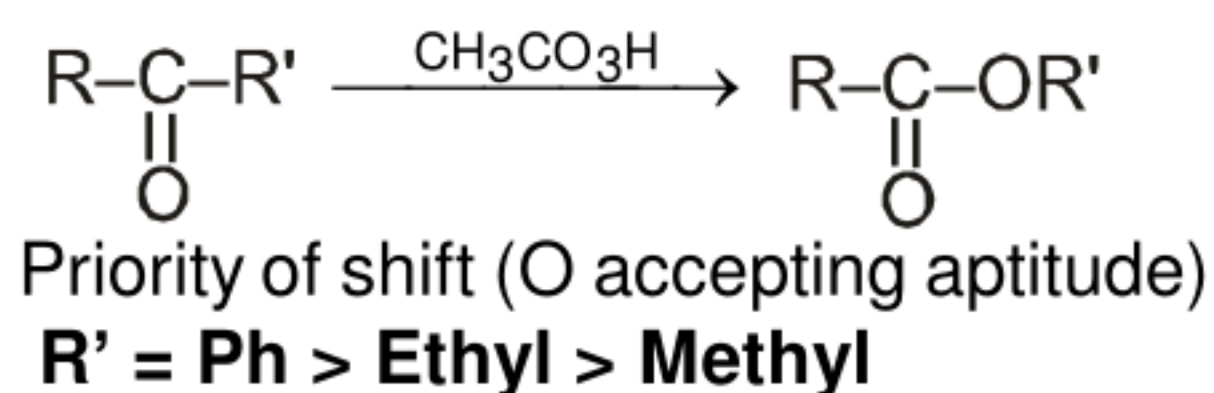
Condition : Vicinal diol, α - Hydroxy ketone & α -diketone can oxidise by HIO_4



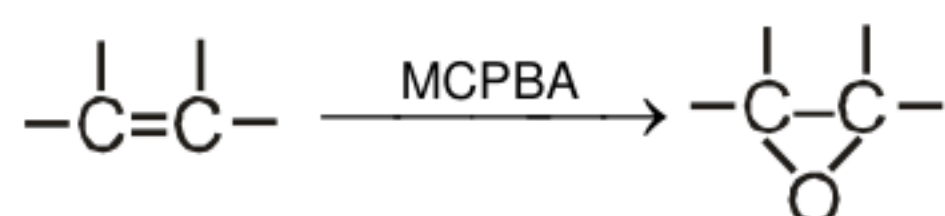
(5) Baeyer's reagent and $\text{OsO}_4 + \text{NaHSO}_3$



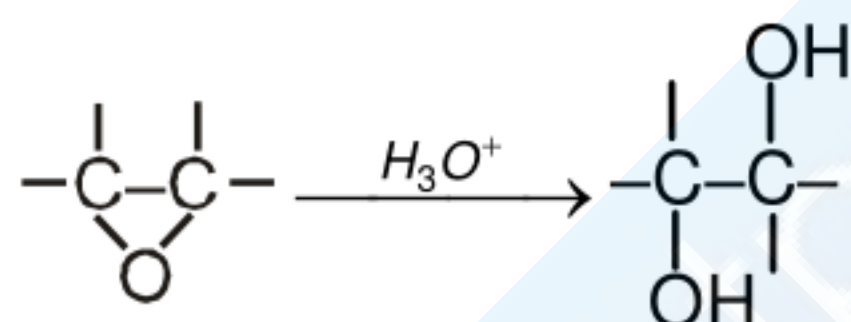
(6) Baeyer-Villiger oxidation (m-CPBA or $\text{CH}_3\text{CO}_3\text{H}$)



(7) Prilezhaev reaction



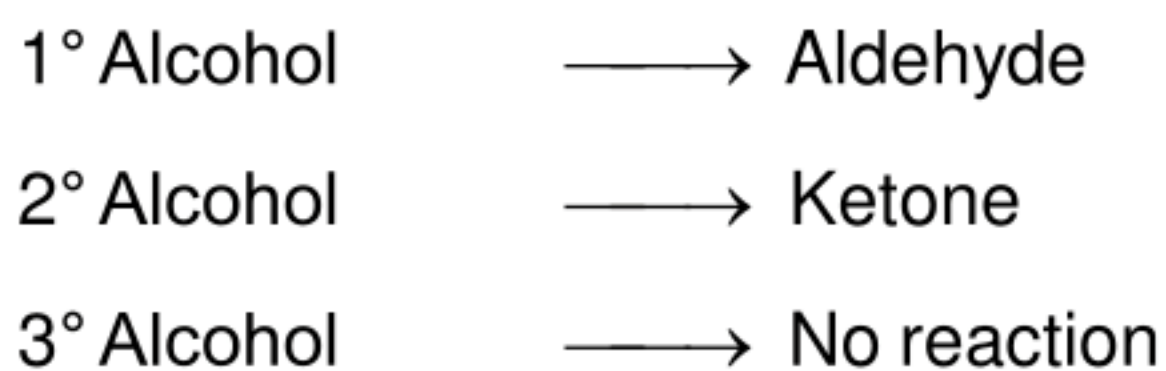
Anti hydroxylation :



(8) oxidation by HNO_3



(9) oxidation by MnO_2



Note : Only allylic and benzylic alcohols are oxidised by MnO_2 .