

## • Points to remember in Oxidation Reaction

(1) **KMnO<sub>4</sub>** (in both medium) or  
**K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>** (in acidic medium)

Aldehyde  $\longrightarrow$  Acid

1° Alcohol  $\longrightarrow$  Acid

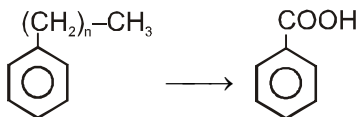
2° Alcohol  $\longrightarrow$  Ketone

3° Alcohol  $\longrightarrow$  No reaction

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

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)  
**CrO<sub>3</sub>/HCl/Pyridine**

1° ROH  $\longrightarrow$  Aldehyde

2° ROH  $\longrightarrow$  Ketone

3° ROH  $\longrightarrow$  No reaction

(3) **Cu/573 K**

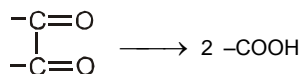
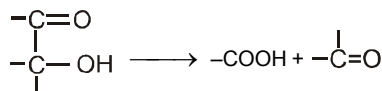
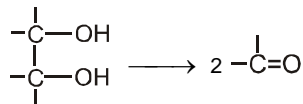
1° Alcohol  $\longrightarrow$  Aldehyde

2° Alcohol  $\longrightarrow$  Ketone

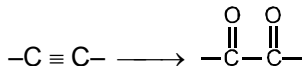
3° Alcohol  $\longrightarrow$  Alkene

#### (4) $\text{HIO}_4$ (Periodic Acid)

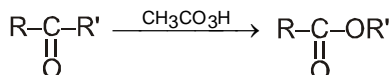
**Condition** : Vicinal diol,  $\alpha$ - Hydroxy ketone &  $\alpha$ -diketone can oxidise by  $\text{HIO}_4$



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



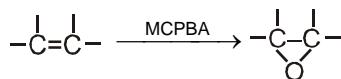
#### (6) Baeyer–Villiger oxidation (m-CPBA or $\text{CH}_3\text{CO}_3\text{H}$ )



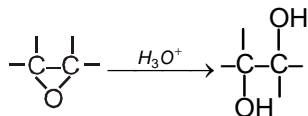
Priority of shift (O accepting aptitude)

$\text{R}' = \text{Ph} > \text{Ethyl} > \text{Methyl}$

#### (7) Prilezhaev reaction



Anti hydroxylation :



### **(8) oxidation by $\text{HNO}_3$**

Aldehyde	————→	Acid
1° Alcohol	————→	Acid
2° Alcohol	————→	no reaction
3° Alcohol	————→	No reaction

### **(9) oxidation by $\text{MnO}_2$**

1° Alcohol	————→	Aldehyde
2° Alcohol	————→	Ketone
3° Alcohol	————→	No reaction

**Note :** Only allylic and benzylic alcohols are oxidised by  $\text{MnO}_2$ .