

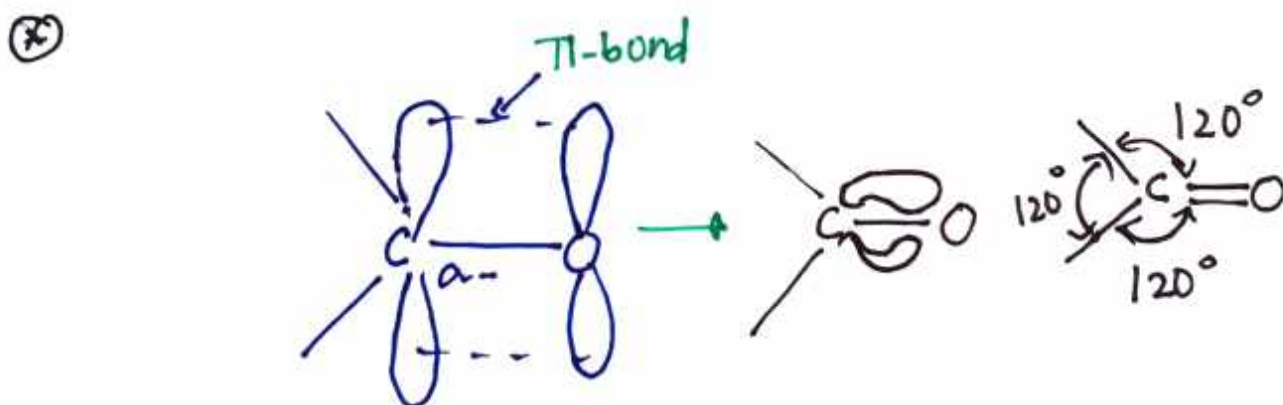
ALDEHYDES

* General formula: $R-\overset{\overset{O}{\parallel}}{C}-H$, $R \Rightarrow$ alkyl group or aryl group

* Ketones: General formula: $R-\overset{\overset{O}{\parallel}}{C}-R'$
 $R \& R' \Rightarrow$ alkyl or aryl groups.

* Both aldehydes and ketones contain the carbonyl group ($-\overset{\overset{O}{\parallel}}{C}-$), are called carbonyl compounds.

Structure of Carbonyl group



* C-atom is sp^2 hybridized.

* Due to the electronegativity difference between oxygen and carbon, polarisation of $C=O$ bond occurs.



Comparison of $\text{C}=\text{O}$ bond & $\text{C}=\text{C}$ bond :-

⊗ Similarities:

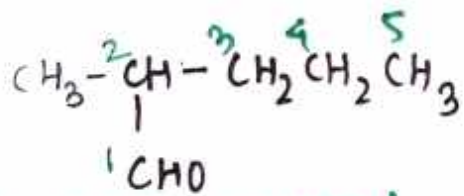
- ⇒ Both consists of a σ -bond and a π -bond.
- ⇒ Both are planar in nature.
- ⇒ Both have bond angle of about 120° .
- ⇒ Both have them have sp^2 hybridized carbon.
- ⇒ Both undergo addition reactions.

⊗ Differences:

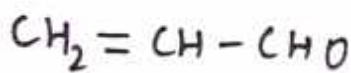
- ⇒ The carbonyl group is polar in nature, while $\text{C}=\text{C}$ bond is non-polar.
- ⇒ $\text{C}=\text{C}$ bond undergoes electrophilic addition reaction while $\text{C}=\text{O}$ bond undergoes nucleophilic addition reaction.

Nomenclature of aldehydes

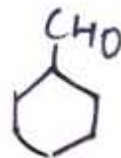
	<u>Common Name</u>	<u>IUPAC name</u>
⊗ HCHO	Formaldehyde	Methanal
$(\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{H})$ CH_3CHO	Acetaldehyde	Ethanal
$\text{CH}_3\text{CH}_2\text{CHO}$	Propionaldehyde	Propanal
$\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$	Butyraldehyde	Butanal
$\text{C}_6\text{H}_5\text{CHO}$	Benzaldehyde	Benzene carboxaldehyde



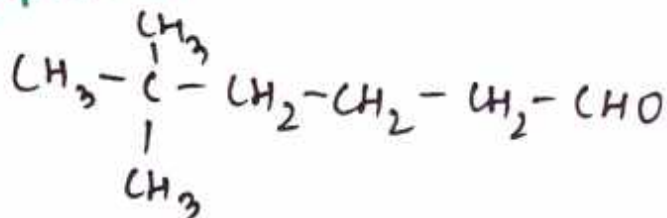
2-Methylpentanal



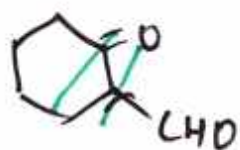
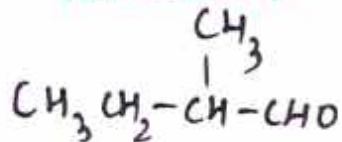
Propenal



Cyclohexane carbaldehyde

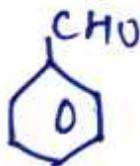


5,5-dimethyl hexanal

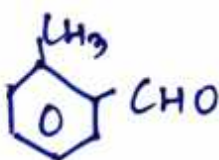


Aromatic Aldehyde
↓
2 Types

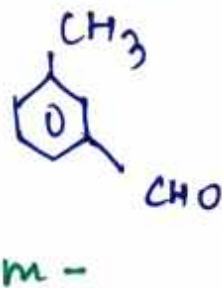
① Nuclear Substituted aldehydes :- When a H-atom from the benzene nucleus is replaced by -CHO group, we get nuclear substituted aldehydes.



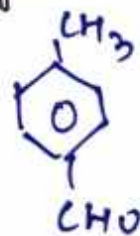
Benzaldehyde



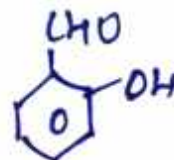
o-Tolualdehyde



m-

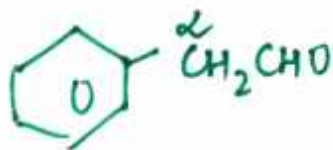


p-

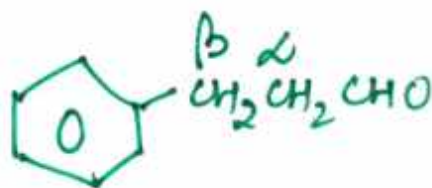


o-Hydroxy benzaldehyde

② Side chain Substituted aldehydes :- When a H-atom from the side chain is replaced by -CHO group.



α-Phylacetaldehyde



β-Phenylpropionaldehyde.