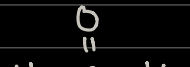
ALDEHYDES + KETONES

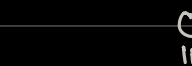
↳ Called carbonyl compounds because they contain the carbonyl group

Aldehydes

where R can be H

1st  methanal

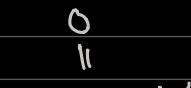
2nd  ethanal

3rd  propanal

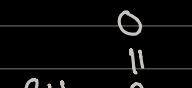
4th  butanal

Example:
written as ... CH_3CH_2CHO for propanal

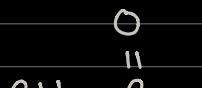
Ketones

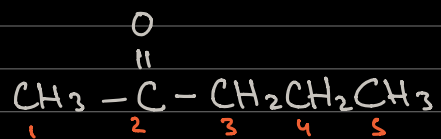


where R cannot be H

1st  propanone or "acetone" or dimethylketone

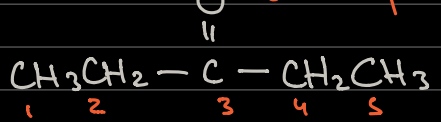
↳ would be written as CH_3COCH_3

2nd  butanone

3rd 

Positional Isomers

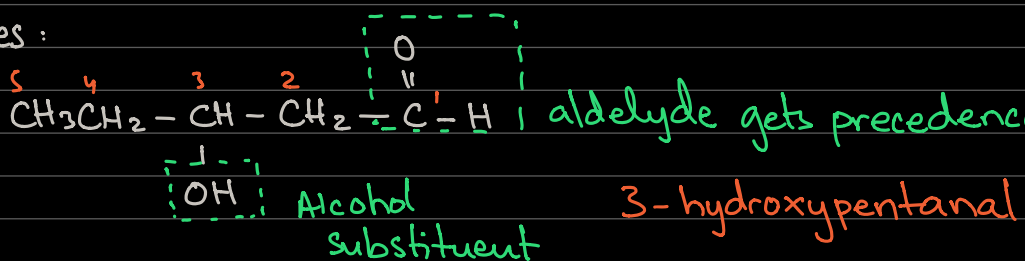
pent-2-one or 2-pentanone

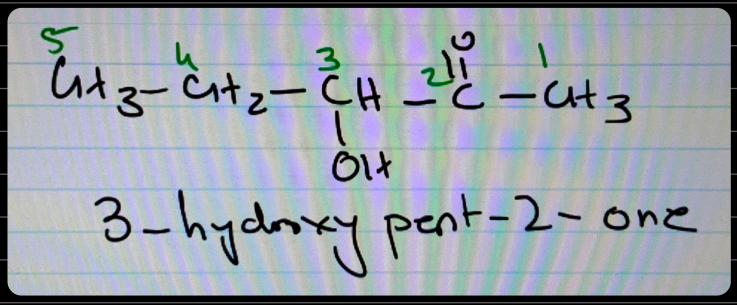


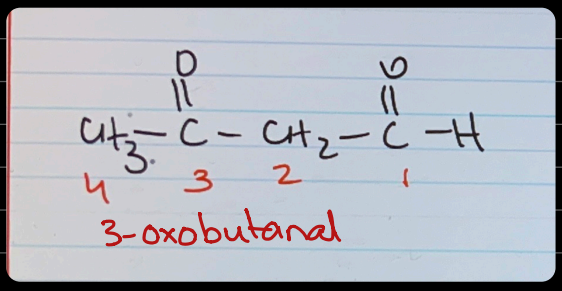
pent-3-one or 3-pentanone

Precedence in naming:
1. Carboxylic Acids
2. Nitriles
3. Aldehydes
4. Ketones
5. Alcohols

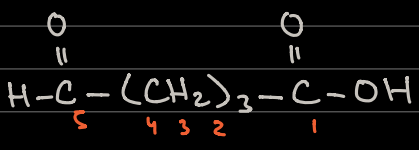
Examples:

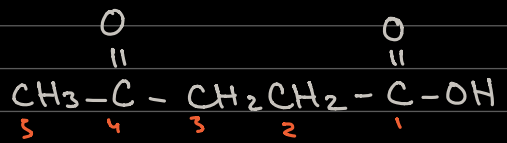






Note: When aldehydes and ketones are substituents, they are called -oxo and are given a number on the chain

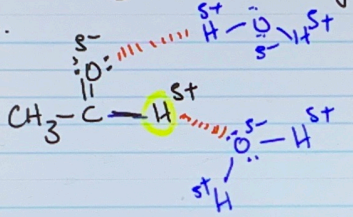




Q. How to differentiate whether an -oxo compound is an aldehyde or ketone?
If -oxo group is on the last / terminal carbon, then it's an aldehyde group, otherwise it's a ketone group

SOLUBILITY:

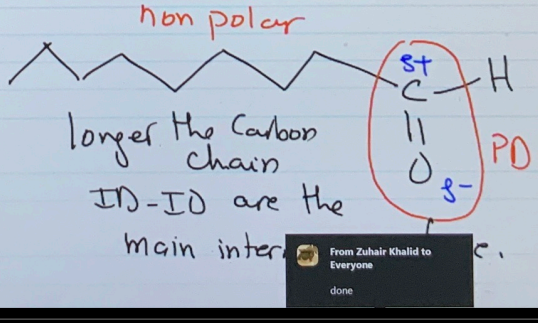
Solubility in water: Lower aldehydes are soluble in water i.e $HCHO$ & CH_3CHO as they can form hydrogen bonds with water.



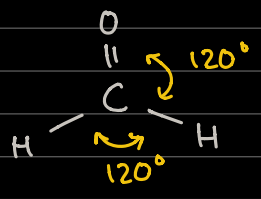
Water's (H) is electron deficient

Solubility in water decreases as the number of carbons increase as VDW (ID-ID) start to dominate.

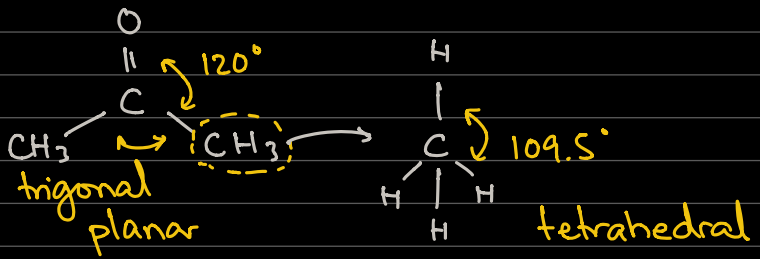
F ····· H
O ····· H
N ····· H



BOND ANGLES & SHAPES

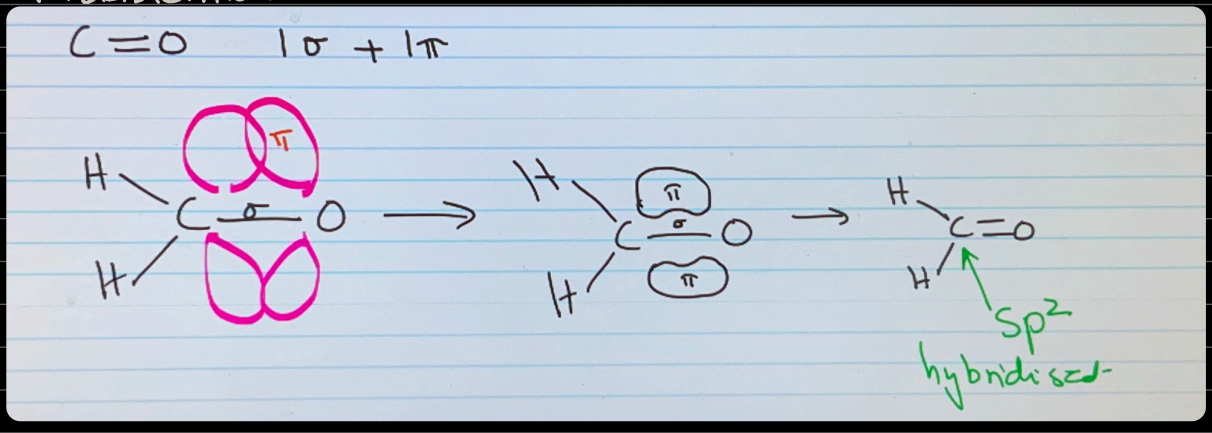


trigonal planar

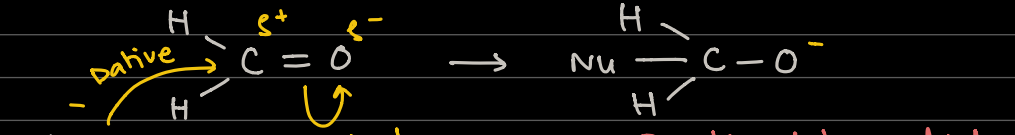


trigonal planar → tetrahedral

HYBRIDISATION:



REACTIVITY:



Nucleophile

USES:

- Ketones have a sweet smell like esters
- Aldehydes have a stringent (sharp + unpleasant) odour
- H–C(=O)–H → methanal ⟶ aka "Formalin" solution
  ↳ used to preserve biological specimens