

welcome to iit paal program today we will discuss class 12 unit 12 aldehydes ketones and carboxylic acids and aldehydes ketones and carboxylic acids are called carbonyl compounds and they have common functional group which is called carbonyl and they can be represented by the groups attached like R and R dash and depending on the properties and the structure of R and R dash they are called different derivatives

so first we will learn about aldehydes in aldehydes R and or R dash is equal to hydrogen

so one of them must be hydrogen and in ketones R and R dash must be alkene or aryl groups in carboxylic acid the R dash should be OH and in carboxylic acid and in carboxylic acid ester there will be a OR dash or OR double dash group in carboxylic acid halides are dash will be chlorine bromine iodine etcetera acid anhydrides are represented by this structure where R and R dash can be same or different and they are called carboxylic acid anhydride here at does when it is NH₂ then it is called primary amide when it is NH R dash then it is called secondary amide and when it is in R dash two then it is called tertiary amide

so now we know the structures of the carboxylic acid derivatives and our first discussion will be on aldehydes and ketones

so some aldehydes and ketones are important and they are fragrant molecules like vanillin salicylaldehyde and cinnamaldehyde they are important molecules

so the structures are

so vanillin and this is beta unsaturated aldehyde which is called cinnamaldehyde

so we will first discuss common names and generally each of carboxylic acid is named by IUPAC like acetic acid to acetaldehyde and the positions of the substituents are presented by latin terms alpha gamma delta etcetera and let us discuss some examples now this is acetic acid and its corresponding aldehyde is this is acetyl group similarly this is benzoic acid and the corresponding aldehyde is called benzaldehyde now let us discuss an example here we can give the numbering alpha beta gamma etcetera

so this is the aldehyde carbon and this will be alpha carbon this will be beta and this will be gamma

so this common name will be gamma bromo butyraldehyde similarly this will be beta methyl propanaldehyde because this is in the beta position the methyl group is in the beta position

so you have to first write the substituent like beta methyl and then the parent chain propanaldehyde now we will discuss common name of ketones here initially by prefixing you have to give the alkyl or aryl groups then the alkyl groups attach to the carbonyl groups

so this is this called dimethyl ketone

so these two methyl groups will come first and then the term just ketone will come similarly this can be called ethyl methyl ketone this called cyclopropyl this is the cyclopropyl group

so cyclopropyl first comes because of C and then methyl comes

so cyclopropyl methyl ketone for aromatic ketones like this one this term is called generally phenone and this will be the corresponding acyl group

so first prefix will be the corresponding acyl group and then you have to add phenone

so this compound will be named as acetophenone similarly this compound will be called as propiophenone because this is propional

so it will be called as propiophenone let us discuss some more example

so this group is called benzoin

so what will be its name its name will be benzoin phenone clear now we will go to the IUPAC names first we will discuss open chain aldehydes and the rule is that

then us be and the numbering will start from the aldehyde group and then the substituents substituents will be numbered

so here this one two three numbering will come no alpha beta gamma and this will be in prefix

so corresponding alkene name before that you have to add these substituents so let us discuss some examples

so the simplest one is this is called ethanol and of course this is the ah simplest this is called methanol

so e is replaced by l then substituents as i told that the aldehyde group will always get the first numbering

so this will be one two three four and depending on the alphabetical order so here bromo comes first

so you have to write first four bombos

so this is true method

so this is the parent chain is the butanol

so you have to write at last and then pulse the sub students let us discuss some more examples when another carbonyl group is present in the chain along with the aldehyde then its get called oxo

so here the numbering will be one two three four five

so what will be the effect name of this it will be four oxy this is five chain five carbon chain

so it will be penta null pentane here since there are three ah alright group

so we have to give numbering and we cannot give priority to any the aldi group and this compound is called one two three or first propane type car carbaldeh height

so this carbaldehyde corresponds to the cho group this will see in the cyclic compound that this carbonate is very important

so lets discuss some cyclic compounds and the numbering will start from

so where the c h group attach that carbon atom in the ring will get number one let us discuss some example this called

so this is the parent chain what is the parenting here cyclohexane

so the compounds euphagname will be cyclo hexane carbaldehyde what will be the name of this compound here there are substituents

so you have to arrange the substance in the alphabetical order

so for bombo four bromo three methyl cyclohexane carbaldehyde let us discuss some aromatic examples aromatic cyclic compounds what is the ring here this ring is benzene

so according to our rule it will be called as benzene carbaldehyde but the common name benzaldehyde is very popular and it has been also accepted as eupac name here also the numbering will start from the carbon atom where the aldehyde group is attached

so what will be its name three methyl four nitro benzaldehyde let's discuss now eupac name of ketones and first open chain ketones a

so you have to find the longest chain containing the carbonyl group and here since the ketone the carbonyl group in between the chain

so you have to give the minimum number to the carbonyl group and also you have to indicate the position you have to indicate this is different from aldehyde because aldehyde the position is not important because it is always under number one but ketone you have to give the indicate the position by giving a numbers first discuss some examples

so this is the longest same this is the parent chain and now the minimum number of the carbonyl will come from this side

so you can call its to known yeah this is important that alkene e replaced by one

so this is the pentane ring

so pentanone and you have to indicate the position of the carbonyl that you can give two edge either right before the name like two pentanone or penton then two own here the numbering will start such as always you have to give the minimum number depending on but independent of the other substance

so here the minimum numbering will come from this side and when the substance are present you have to choose this way like this because you have to give already this numbering

so four bomb three hydroxy butan to own let's discuss some more my example

so here numbering will start from the carbonyl because this is phenyl

so we cannot give number to the phenyl here

so we have to start from the carbonyl

so the name will be three phenyl propane one volt sorry this is one phenyl sorry this is one

so one phenyl one phenyl propane one own now discuss some cyclic ketones

so here also e is replaced by own and you have to write the parent cyclo alkene name and then you have to add the suffix one and the numbering um

so numbering will start from the carbonyl group in the ring

so carbonyl group will get number one let us discuss some example

so this is the carbonyl compounds cyclic carbonyl here it will get the one into three four five

so what will be its impact name and here interestingly since carbonyl is getting one

so you may omit the position of the carbonyl group here

so this compound can be called directly as three methyl cyclopentanone this compound can be called as four hydroxy four hydroxy cyclohexanone

so cycle is the parent ring here and then we have to add the own when two carbonyls groups are present like this then they are called dione a numbering will start one of the carbonyl groups

so the eupac name will be here again the position will come that what is the relation whether they are one three or one four

so then the impact name will be two methyl cyclohex one three diode sorry this will be cyclohexane hexane one three diode lets discuss another one this will be again two methyl cyclohexane cyclo two methyl cyclohexane one photon what will be this name two methyl x sun now we have to give the position of the carbonyl one three five triune

so let us conclude here the nomenclature you