

CHEMISTRY STUDY MATERIALS FOR CLASS 12

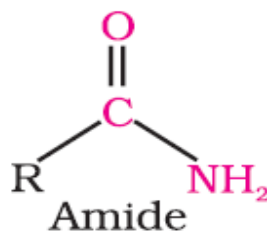
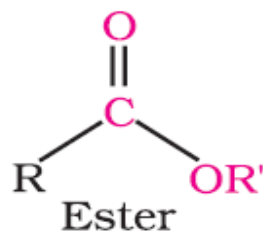
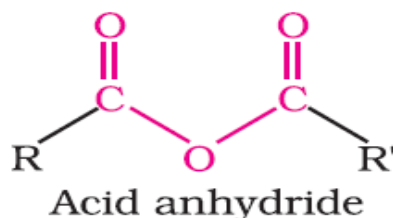
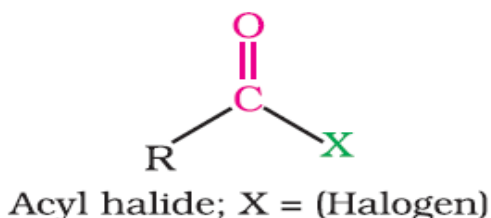
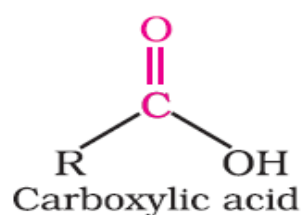
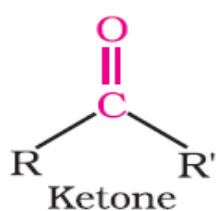
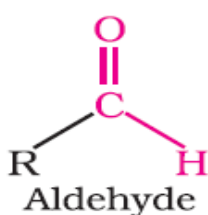
(NCERT Based Notes of Chapter - 11)

GANESH KUMAR

DATE:- 13/10/2020

Aldehyde, Ketones and Carboxylic Acid

These are compounds containing carbon-oxygen double bond ($>C=O$) called carbonyl group. In aldehydes, the carbonyl group is bonded to a carbon and hydrogen while in ketones; it is bonded to two carbon atoms. The carbonyl compounds in which carbonyl group is bonded to oxygen are known as carboxylic acids, and their derivatives (e.g. esters, anhydrides) while in compounds where carbon is attached to nitrogen and to halogens are called amides and acyl halides respectively. The general formulas of these compounds are:



Aldehydes and Ketones

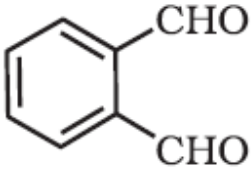
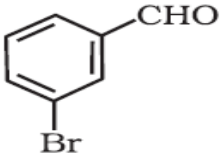
Nomenclature:

The common names of most aldehydes are derived from the common names of the corresponding carboxylic acids by replacing the ending $-ic$ acid with aldehyde. The position of the substituent in the carbon chain is indicated by Greek letters α , β , γ , δ , etc.

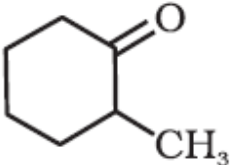
The common names of ketones are derived by naming two alkyl or aryl groups bonded to the carbonyl group and by suffixing ketone. The positions of the substituents are indicated by Greek letters, α , α' , β , β' and so on.

The IUPAC names of open chain aliphatic aldehydes and ketones are derived from the names of the corresponding alkanes by replacing the ending $-e$ with $'-al'$ and $'-one'$ respectively. In case of aldehydes the longest carbon chain is numbered starting from the carbon of the aldehyde group while in case of ketones the numbering begins from the end nearer to the carbonyl group.

Some examples are:

Compound	Common name	IUPAC name
ALDEHYDES		
HCHO	Formaldehyde	Methanal
CH ₃ CHO	Acetaldehyde	Ethanal
(CH ₃) ₂ CHCHO	Isobutyraldehyde	2-Methylpropanal
CH ₃ CH(OCH ₃)CHO	α -Methoxy propionaldehyde	2-Methoxypropanal
CH ₃ CH ₂ CH ₂ CH ₂ CHO	Valeraldehyde	Pentanal
CH ₂ =CHCHO	Acrolein	Prop-2-enal
	Phthaldehyde	Benzene-1,2-dicarbaldehyde
	m-Bromobenzaldehyde	3-Bromobenzene carbaldehyde Or 3-Bromobenzaldehyde

KETONES

Compound	Common name	IUPAC name
CH_3COCH_3	Acetone	Propanone
$\text{CH}_3\text{COCH}_2\text{CH}_3$	Ethyl methyl ketone	Butanone
$\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$	Methyl n-propyl ketone	Pentan-2-one
$\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$	Diethyl ketone	Pentan-3-one
$(\text{CH}_3)_2\text{CHCOCH}(\text{CH}_3)_2$	Diisopropyl ketone	2,4-Dimethylpentan-3-one
$(\text{CH}_3)_2\text{C}=\text{CHCOCH}_3$	Mesityl oxide	4-Methylpent-3-en-2-one
	α -Methylcyclohexanone	2-Methylcyclohexanone
