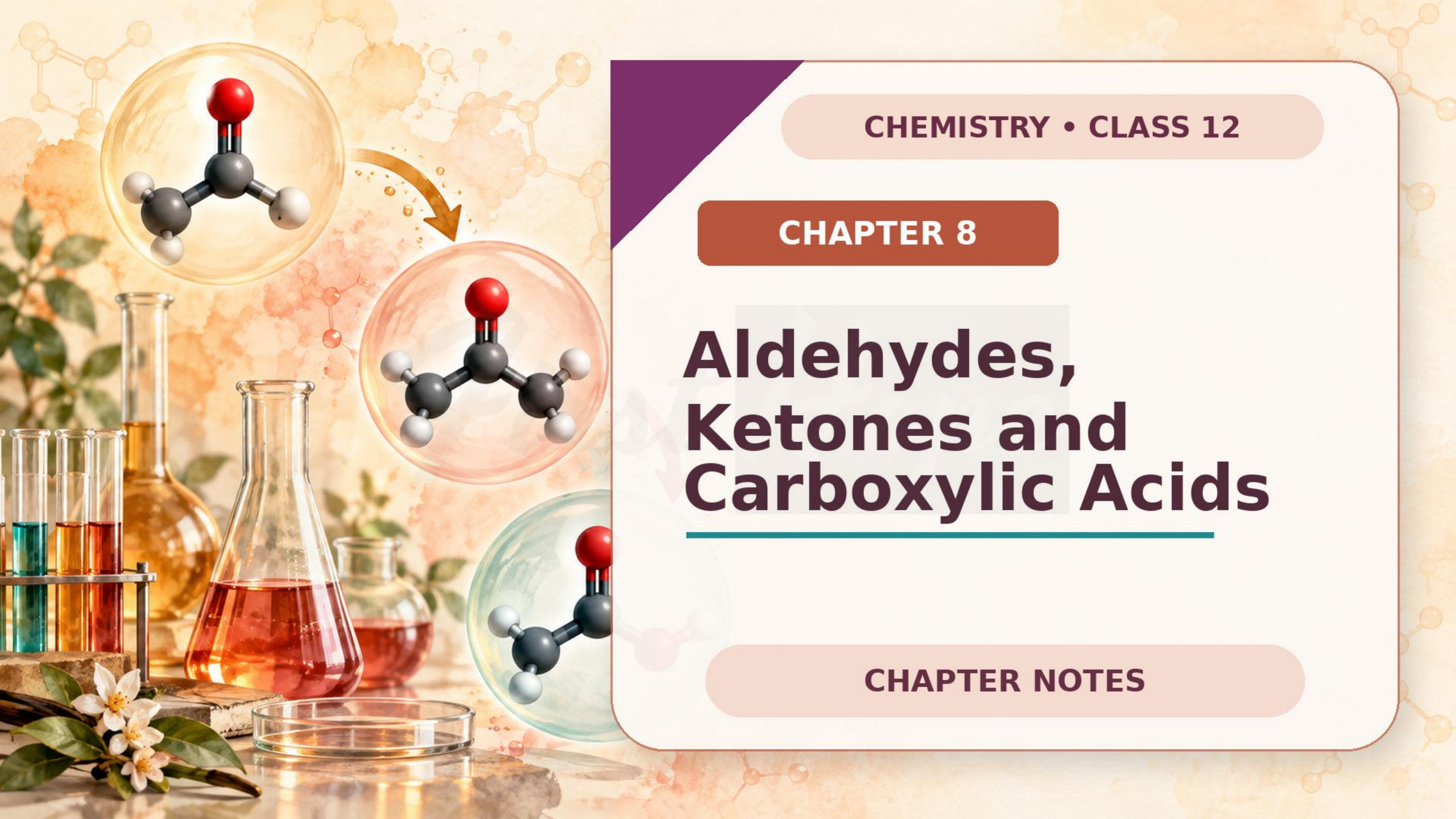


The background features a collage of chemistry-related images. On the left, there are several pieces of laboratory glassware: a rack of test tubes containing liquids of different colors (blue, orange, red), a round-bottom flask with yellow liquid, a large Erlenmeyer flask with red liquid, and a small beaker with orange liquid. In the foreground, there are some white flowers and green leaves. On the right, there are three molecular models of organic compounds, each enclosed in a translucent sphere. The top sphere is yellow and contains a molecule with a central carbon atom (grey) bonded to a red oxygen atom, two white hydrogen atoms, and another grey carbon atom bonded to two more white hydrogen atoms. An orange arrow points from this sphere to a middle sphere, which is orange and contains a similar molecule. A third sphere, which is green and contains a similar molecule, is partially visible at the bottom. The background is a warm, orange-toned watercolor wash with faint molecular structures.

CHEMISTRY • CLASS 12

CHAPTER 8

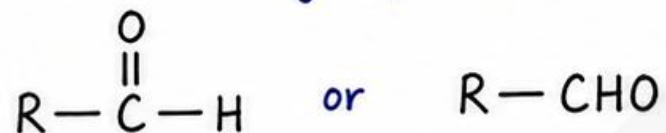
Aldehydes, Ketones and Carboxylic Acids

CHAPTER NOTES

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS — OVERVIEW

① ALDEHYDES:

Carbonyl group bonded to one hydrogen atom and one carbon group.



where R = H, alkyl, aryl
(any carbon group)

② KETONES:

Carbonyl group bonded to two carbon groups.



where R, R' = alkyl, aryl
(any carbon group)

③ CARBOXYLIC ACIDS:

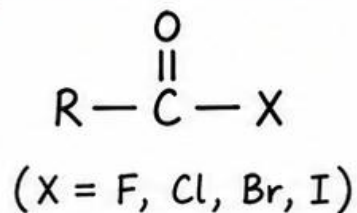
Carbonyl group and hydroxyl group bonded to the same carbon.



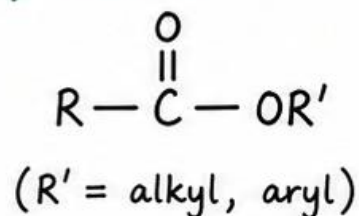
where R = H, alkyl, aryl
(any carbon group)

FAMILY OF CARBOXYLIC ACID DERIVATIVES (formed by replacing -OH of -COOH)

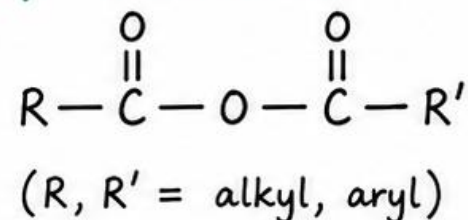
1) ACYL HALIDE



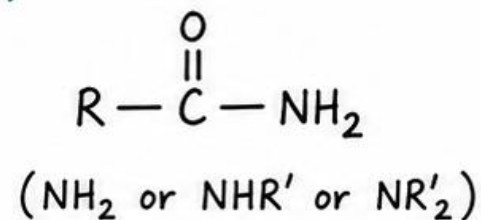
2) ESTER



3) ANHYDRIDE



4) AMIDE



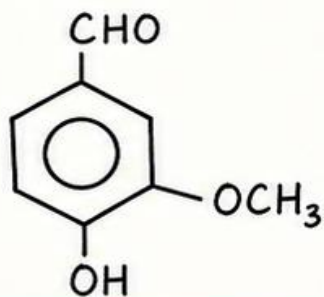
These compounds are called carboxylic-acid derivatives because they can be obtained from carboxylic acids by replacing the -OH group of the -COOH group with another group.

NATURAL OCCURRENCE AND PRACTICAL ROLES

Carbonyl compounds are widespread in nature. Many responsible for characteristic scents and flavours of plants. They are also of immense practical importance in industries and everyday life.

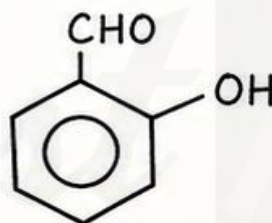
Natural occurrence in plants (as aroma and flavour constituents)

(1) VANILLIN



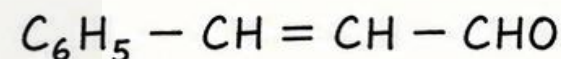
Occurs in vanilla beans.
Gives vanilla fragrance and flavour.

(2) SALICYLALDEHYDE (o-hydroxybenzaldehyde)



Occurs in meadow-sweet
(*Spiraea ulmaria*).
Gives characteristic sweet fragrance.

(3) CINNAMALDEHYDE



Occurs in cinnamon bark.
Gives cinnamon fragrance and warm spicy flavour.

Practical roles

ACETONE
 $(\text{CH}_3)_2\text{CO}$

Important industrial solvent.

Carbonyl compounds are used in the manufacture of:

- Adhesives
- Resins
- Plastics
- Pharmaceuticals (many drugs and intermediates)
- Paints
- Perfumes
- Fabrics

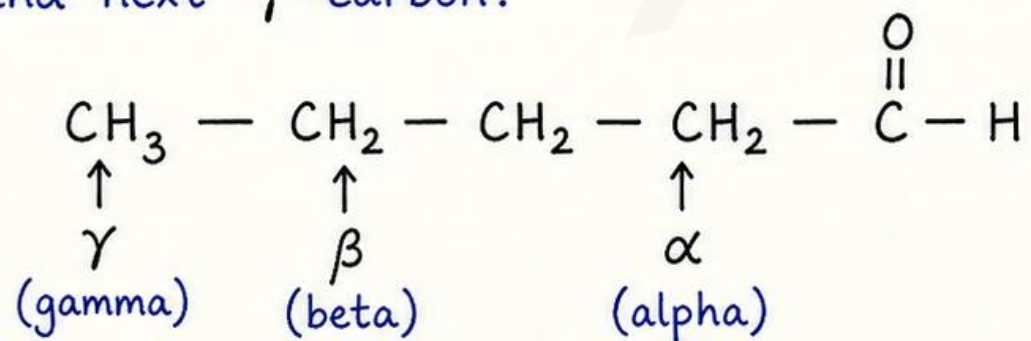
* SAFETY NOTE: Natural occurrence does not mean harmless; use substances only as intended.

COMMON NAMES OF ALDEHYDES

RULE :

The common name of an aldehyde is derived from the common name of the corresponding carboxylic acid by replacing the suffix “-ic acid” with “aldehyde”.

The carbon atom adjacent to the $-CHO$ group is called α -carbon, then β -carbon and next γ -carbon.



EXAMPLES :

HCHO	formaldehyde
CH_3CHO	acetaldehyde
$(\text{CH}_3)_2\text{CHCHO}$	isobutyraldehyde
$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$	valeraldehyde
$\text{CH}_2=\text{CHCHO}$	acrolein
$\text{C}_6\text{H}_5\text{CHO}$	benzaldehyde

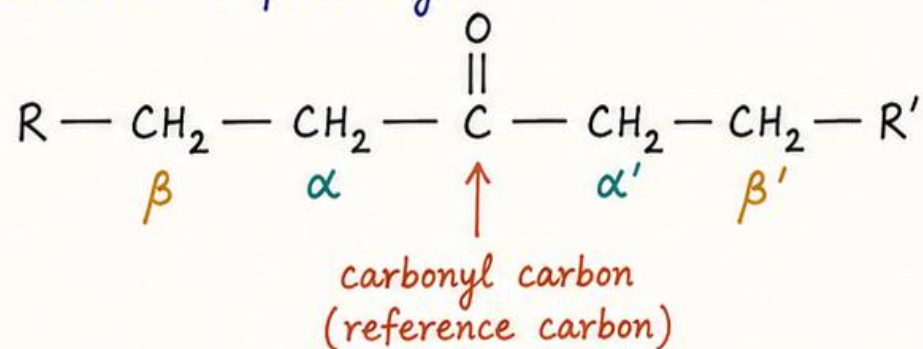
NOTE :

The aldehyde carbon (the carbon of the $-CHO$ group itself) is not called alpha.

COMMON NAMES OF KETONES

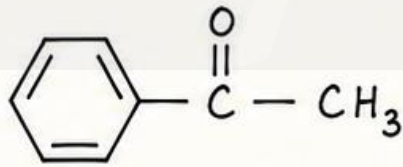
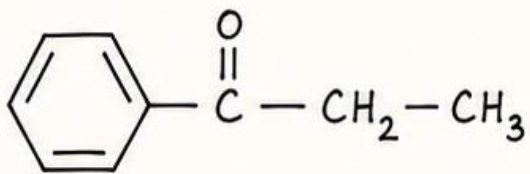
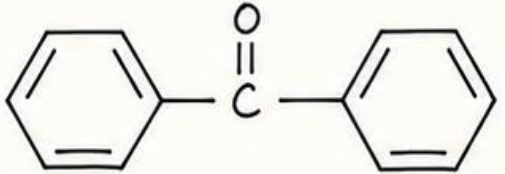
RULES

- Name the two alkyl or aryl groups attached to the carbonyl carbon ($C=O$) and add the word "ketone".
- For numbering the carbon chain, the carbonyl carbon is taken as the reference carbon. The two carbons directly attached to it on either side are called α and α' carbons. The next two carbons are called β and β' carbons respectively.



Note: In aryl ketones, the aryl group is attached through a carbon atom of the ring.

EXAMPLES

- $CH_3 - \overset{O}{\parallel} C - CH_3 \rightarrow$ acetone / dimethyl ketone
- $CH_3 - \overset{O}{\parallel} C - CH_2 - CH_2 - CH_3 \rightarrow$ methyl n-propyl ketone
- $(CH_3)_2CH - \overset{O}{\parallel} C - CH(CH_3)_2 \rightarrow$ diisopropyl ketone
-  $\rightarrow$ acetophenone
-  $\rightarrow$ propiophenone
-  $\rightarrow$ benzophenone



FREE PREVIEW

[Click here to visit our website](#)

SCHOOL NOTES & NCERT SOLUTIONS

Complete notes and
NCERT solutions are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app



Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHope_CBSE_Notes

Instagram

@firsthope.school

[Click here to follow >](#)

YouTube channel

@firsthope.school

[Click here to watch >](#)

FirstHope website

firsthope.co.in

[Click here to visit our website >](#)

CBSE / Class 9 / Class 10 / Class 11 / Class 12

Preview notes and NCERT solutions. Full PDFs in the FirstHope app.