

CLASS 12 CHEMISTRY • SECTION 8.1.1

Nomenclature of Aldehydes and Ketones

Mastering Common and IUPAC Systems for Carbonyl Compounds.



THE CARBONYL GROUP

The Blueprint of Flavors, Fragrances, and Solvents

Carbonyl compounds are the functional backbone of organic chemistry, dictating properties from the scent of vanilla (vanillin) to industrial solvents.

Aldehydes

Terminal Carbonyls

The $>\text{C}=\text{O}$ group is bonded to at least one Hydrogen.



Ketones

Internal Carbonyls

The $>\text{C}=\text{O}$ group is bonded to two Carbon atoms.



Because of their widespread use, both historical (Common) and systematic (IUPAC) naming systems are crucial for exams and industry.

HISTORICAL NOMENCLATURE

From Origins to Aldehydes

Derived from the corresponding carboxylic acid by replacing the suffix -ic acid with -aldehyde (e.g., Formic Acid $\rightarrow$ Formaldehyde).

Substituent locations are marked by Greek letters (α , β , γ , δ). The α -carbon is the one directly linked to the -CHO group.

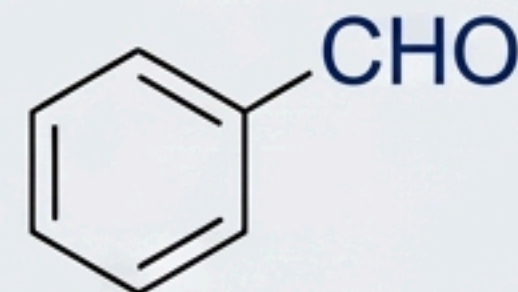
Formula Strip



Formaldehyde



Acetaldehyde



Benzaldehyde



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Alkyl Radicals and Phenones

Aliphatic

Name the two alkyl/aryl groups attached to the carbonyl carbon, followed by the word ketone. Substituents use α , α' , β , β' beginning next to the $>\text{C}=\text{O}$.



Acetone

(Dimethyl ketone)



Acetophenone

(Methyl phenyl ketone)

Aromatic

Alkyl phenyl ketones use the acyl group prefix combined with the word -phenone.



Benzophenone

(Diphenyl ketone)

The Terminal Priority: Suffix -al

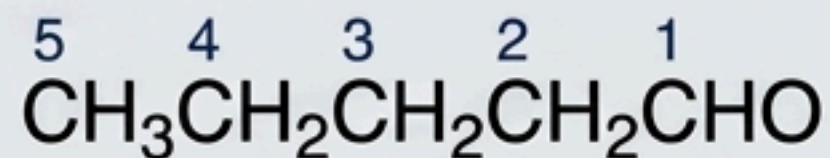
Open Chain

Replace alkane -e with -al. Numbering always starts at the aldehyde carbon (C-1).

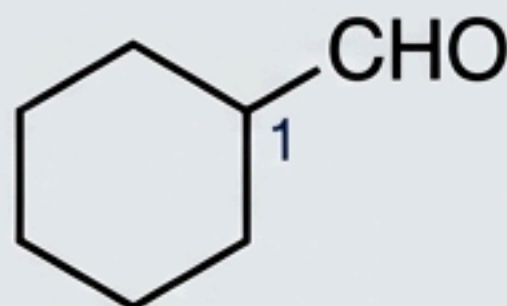
Cyclic

When attached directly to a ring, use the suffix -carbaldehyde. The ring carbon attached to -CHO is numbered 1.

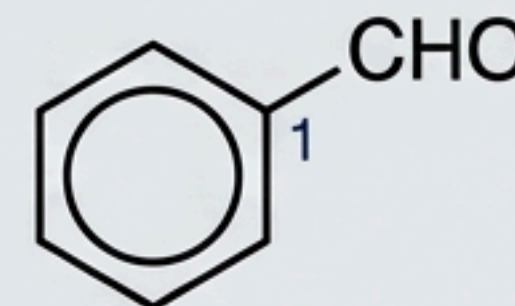
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Pentanal



Cyclohexanecarbaldehyde



Benzenecarbaldehyde

(Benzaldehyde also accepted)

The Internal Link: Suffix **-one**

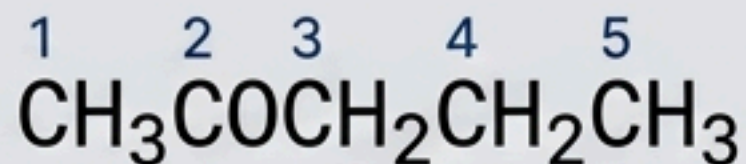
Open Chain

Replace alkane **-e** with **-one**. Numbering begins from the end nearer to the carbonyl carbon.

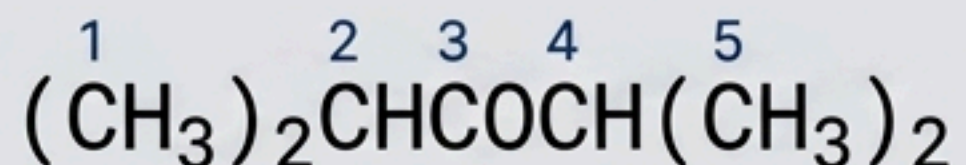
Cyclic

The carbonyl carbon itself is numbered 1.

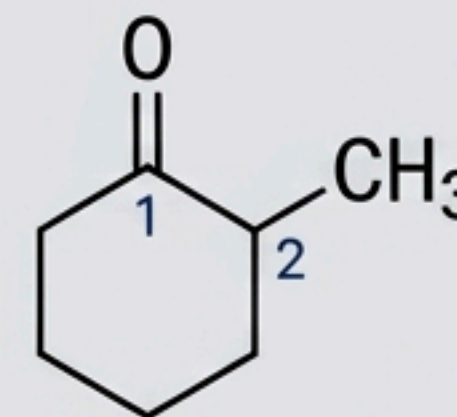
Formula Strip



Pentan-2-one



2,4-Dimethylpentan-3-one



2-Methylcyclohexanone

The Nomenclature Matrix

Structure	Common Name	IUPAC Name
HCHO	Formaldehyde	Methanal
CH_3CHO	Acetaldehyde	Ethanal
$\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$	Methyl n-propyl ketone	Pentan-2-one
$\text{CH}_2=\text{CHCHO}$	Acrolein	Prop-2-enal

Pro-Tip: Always check if the carbonyl is terminal (-al) or internal (-one) before numbering!



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