▶ Video explanation (YouTube Short)

Aldehydes vs Ketones: Structure and Naming

Both contain the **carbonyl group, C=O**. Where it sits in the chain decides the family and the name.

1. Structure (NCERT 8.1)

	Aldehyde	Ketone
On the carbonyl carbon	at least one H (R–CHO; H–CHO)	two alkyl or aryl groups (R–CO–R′)
Position of C=O	end of the chain	inside the chain
IUPAC ending	-al	-one
Smallest member	methanal, HCHO (1 C)	propanone, CH_3COCH_3 (3 C)

2. IUPAC names

- **Aldehydes:** alkane − e + **al**: methanal (HCHO), ethanal (CH_3CHO), propanal (CH_3CH_2CHO). The –CHO carbon is always C-1, so no locant is written.
- **Ketones:** alkane − e + **one**: propanone (CH_3COCH_3), butanone ($CH_3COCH_2CH_3$). From five carbons on, give the position: $CH_3COCH_2CH_2CH_3$ is pentan-2-one, $CH_3CH_2COCH_2CH_3$ is pentan-3-one.

3. Common names

Formula	Common name	IUPAC name
HCHO	formaldehyde	methanal
CH_3CHO	acetaldehyde	ethanal
CH_3COCH_3	dimethyl ketone (acetone)	propanone
$CH_3COCH_2CH_3$	ethyl methyl ketone	butanone

Aldehyde common names come from the common names of the matching acids (formic → formaldehyde, acetic → acetaldehyde). Ketone common names name the two groups, in alphabetical order, then "ketone".

Solved example

Q. Name $CH_3CH_2CH_2CHO$ and $CH_3COCH(CH_3)_2$.
A. $CH_3CH_2CH_2CHO$: four carbons, –CHO at C-1: **butanal**. $CH_3COCH(CH_3)_2$: chain of four with C=O at C-2 and a methyl on C-3: **3-methylbutan-2-one**.

Key takeaways

- C=O at the end with an H: aldehyde, ending -al, no locant needed.
- C=O inside the chain: ketone, ending -one, locant from five carbons on.
- The smallest ketone is propanone (three carbons).

Practice questions

1. (MCQ) The IUPAC name of CH_3CHO is: (a) methanal (b) ethanal (c) ethanol (d) acetone
2. (MCQ) The smallest ketone has how many carbon atoms? (a) 1 (b) 2 (c) 3 (d) 4
3. (MCQ) $CH_3CH_2COCH_2CH_3$ is: (a) pentan-2-one (b) pentan-3-one (c) pentanal (d) butanone
4. (Very short) What is the common name of propanone?
5. (Very short) Why is no locant written in the name of an aldehyde?
6. (Short) State one structural difference between an aldehyde and a ketone.
7. (Short) Give the IUPAC names of HCHO and $CH_3COCH_2CH_3$.
8. (Application) Can there be a ketone with only two carbon atoms? Explain.

Answer key

1. (b) ethanal.
2. (c) 3.
3. (b) pentan-3-one.
4. Acetone (dimethyl ketone).
5. The –CHO carbon is always C-1.
6. In an aldehyde the carbonyl carbon carries at least one H (C=O at the chain end); in a ketone it carries two carbon groups (C=O inside the chain).
7. Methanal; butanone.
8. No: a ketone needs a carbon group on each side of the carbonyl carbon, so at least three carbons (propanone).

▶ Watch the video explanation