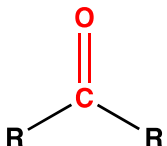


Ketones

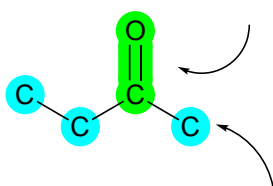
Table of Contents

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Summary

Functional group	General formula	Structure/example	Prefix	Suffix
<i>Ketone</i>	-C=O		oxo-	-one

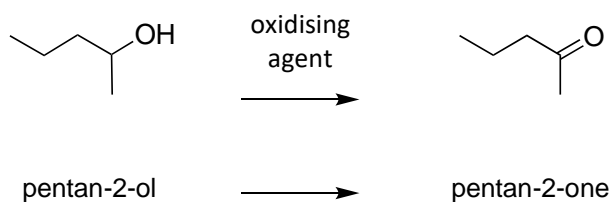
A ketone contains a carbonyl group.
The carbon is attached to an alkyl group on each side



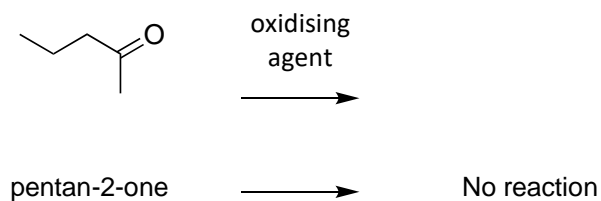
Thus a ketone will never be in the terminal position

Selected Reactions

Ketones are formed by the oxidation of secondary alcohols:

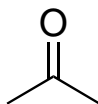


Ketones cannot be further oxidised:



Worked Examples

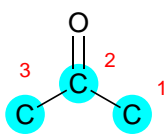
Propanone



STEP 1: Identify the parent hydrocarbon chain

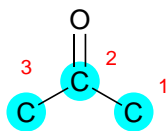
1.1 It should have the functional group with the highest priority

1.2 It should have the maximum length



- Functional group ✓
- Longest chain ✓

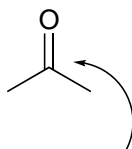
STEP 2: Count the number of carbons in the parent hydrocarbon chain and identify the appropriate prefix. If the parent chain is an alkane, add the -an suffix



3 C = **PROP**

ALKANE = **-AN-**

STEP 3: Identify the functional group with the highest priority and its suffix



KETONE = **-ONE**

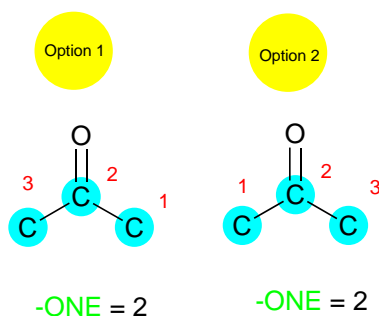
STEP 4: Identify side chains. Count the number of carbons and identify their prefix and suffix

None

STEP 5: Identify any remaining functional groups (including double and triple bonds) and their suffixes

None

STEP 6: Number the parent hydrocarbon chain from the end that produces the lowest set of locants for, in order of precedence, functional groups, double and triple bonds and side chains



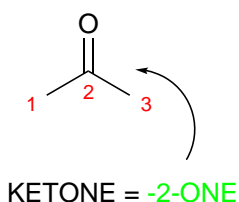
Lowest locants possible ✓

STEP 7: Numbers indicating the locant of the functional group are placed directly before the functional group portion of the name.

7.1 Names are listed alphabetically

7.2 If there is more than one of the same functional group, the prefix di- (2), tri- (3), tetra- (4) are used. These are not considered for alphabetical listing

7.3 If the functional group is in a position where no alternative position is possible, no number is required (e.g. ethan-1-ol should be written as ethanol)



A ketone is never first or last position as there must be a carbon group attached to the **alpha carbon**.

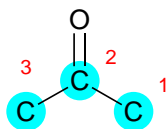
Therefore ketone functional group cannot be on any other position, the 2- locant can be dropped in this case.

STEP 8: Write the complete name

8.1 Commas are written between numbers

8.2 Hyphens are written between numbers and letters

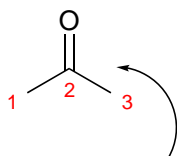
8.3 Successive words are combined into one word



3 C = PROP

ALKANE = -AN-

Steps 1,2



KETONE = -2-ONE

Steps 3,6,7



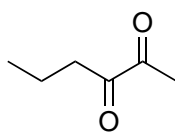
propan-2-one

OR

propanone

Step 8

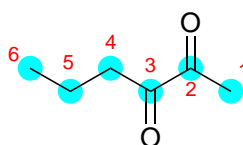
Hexan-2,3-dione



STEP 1: Identify the parent hydrocarbon chain

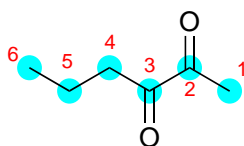
1.1 It should have the functional group with the highest priority

1.2 It should have the maximum length



- Functional group ✓
- Longest chain ✓

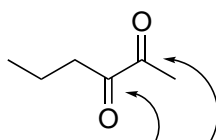
STEP 2: Count the number of carbons in the parent hydrocarbon chain and identify the appropriate prefix. If the parent chain is an alkane, add the -an suffix



6 C = **HEX-**

ALKANE = **-AN-**

STEP 3: Identify the functional group with the highest priority and its suffix



KETONE = **-ONE**

2 x KETONE = **-DIONE**

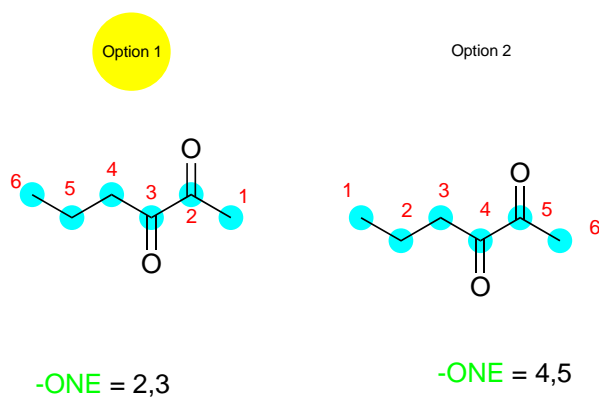
STEP 4: Identify side chains. Count the number of carbons and identify their prefix and suffix

None

STEP 5: Identify any remaining functional groups (including double and triple bonds) and their suffixes

None

STEP 6: Number the parent hydrocarbon chain from the end that produces the lowest set of locants for, in order of precedence, functional groups, double and triple bonds and side chains



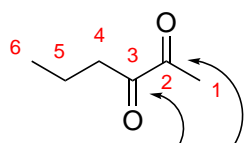
Lowest locants possible ✓

STEP 7: Numbers indicating the locant of the functional group are placed directly before the functional group portion of the name.

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7.3 If the functional group is in a position where no alternative position is possible, no number is required (e.g. ethan-1-ol should be written as ethanol)



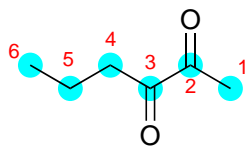
KETONE = -2,3-DIONE

STEP 8: Write the complete name

8.1 Commas are written between numbers

8.2 Hyphens are written between numbers and letters

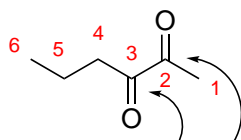
8.3 Successive words are combined into one word



6 C = **HEX-**

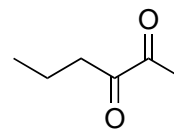
ALKANE = **-AN-**

Steps 1,2



KETONE = **-2,3-DIONE**

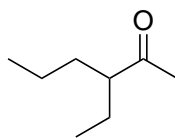
Steps 3,6,7



hexan-2,3-dione

Step 8

3-ethylhexan-2-one

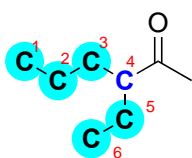


STEP 1: Identify the parent hydrocarbon chain

1.1 It should have the functional group with the highest priority

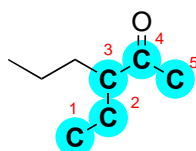
1.2 It should have the maximum length

Option 1



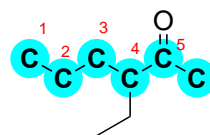
- Functional group ✗
- Longest chain ✓

Option 2



- Functional group ✓
- Longest chain ✗

Option 3

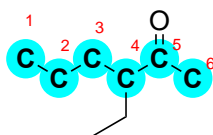


- Functional group ✓
- Longest chain ✓

-CO is the functional group with the highest priority!

STEP 2: Count the number of carbons in the parent hydrocarbon chain and identify the appropriate prefix. If the parent chain is an alkane, add the -an suffix.

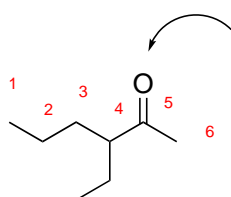
Option 3



6 C = **HEX**

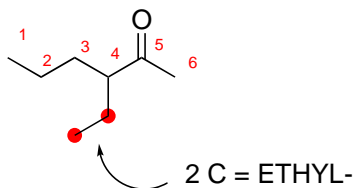
ALKANE = **-AN-**

STEP 3: Identify the functional group with the highest priority and its suffix



KETONE = **-ONE**

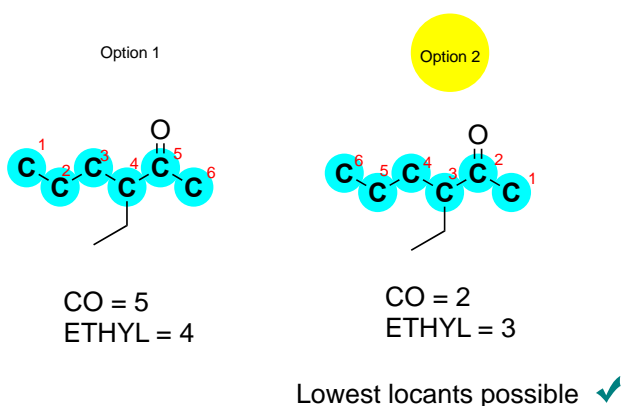
STEP 4: Identify side chains. Count the number of carbons and identify their prefix and suffix



STEP 5: Identify any remaining functional groups (including double and triple bonds) and their suffixes

None

STEP 6: Number the parent hydrocarbon chain from the end that produces the lowest set of locants for, in order of precedence, functional groups, double and triple bonds and side chains

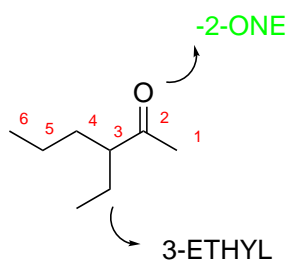


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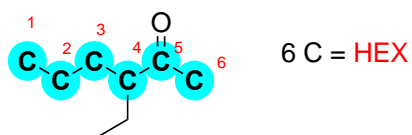


STEP 8: Write the complete name

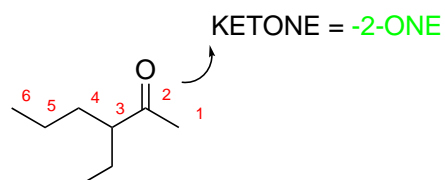
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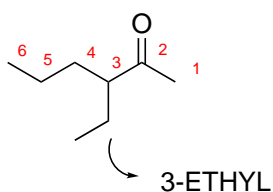
8.3 Successive words are combined into one word



ALKANE = **-AN-**

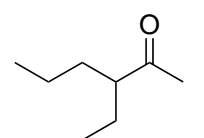


Steps 1,2



Steps 4,6,7

Steps 3,6,7



3-ethylhexan-2-one

Step 8