Cheatography

organic chemistry nomenclature Cheat Sheet

by tofu (tofu425) via cheatography.com/169049/cs/38476/

PREFIXES (based on # of carbon)

# of carbons	root name	substituent group prefix
1	meth-	methyl-
2	eth-	ethyl-
3	prop-	propyl
4	but-	butyl-
5	pent-	pentyl-
6	hex-	hexyl-
benzene	benzene	phenyl-
7	hept-	heptyl-
8	oct-	octyl-
9	non-	nonyl-
10	dec-	decyl-

suffix following root name depends on the classification of the molecule it is referring to. words following substituent group prefix depends on its placement during the name; either followed by the root name or a "-" (e.g. 2-ethyl-4-methylpentane).

benzene is included because it is quirky and special and unique.

ADDITIONAL PREFIXES

classification	identification	prefix
cyclic hydrocarbons	carbons are organized in ring formation	cyclo-
multiple groups	2 of the same group exists	di-
	3 of the same group	tri-
	4 of the same group	tetra-

SUFFIXES

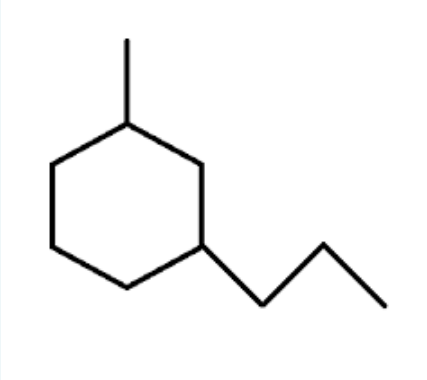
SUFFIXES (cont)

aldehyde	oxygen is double bonded to a carbon at the end of a chain	-al
ket**one**	oxygen is double bonded to a carbon in the middle of a chain	-one
ester	O=C-O-R; carboxylic acid + alcohol	-oate
ether	R-O-R	-oxy-
amine	nitrogen bonded to up to three carbon groups	-amine
amide	O=CH-N	-amide

note: list does not go in order of naming priority; R represents any carbon group

tip for memorization: several of the groups have the ending in their name (indicated in bold in the first column).

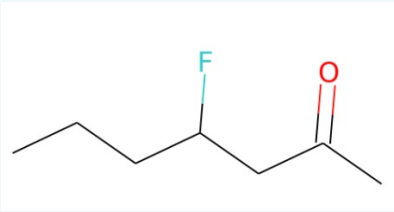
HYDROCARBON NAMING E.G.



1. identify longest chain with highest priority group included as root (e.g. cyclohexane)
2. number carbons in accordance with sub. group priority (e.g. propyl is sub. group with the highest priority, start there)
3. identify substituent groups (e.g. propyl on carbon 1, methyl on carbon 3)
4. write full name with substituent groups in alphabetical order (e.g. 3-methyl-1-propylcyclohexane)

ALDEHYDE NAMING E.G.

KETONE NAMING E.G.

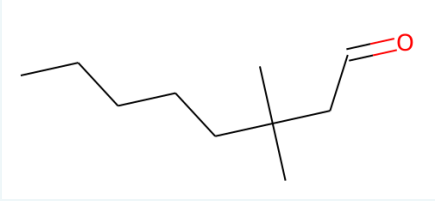


1. identify ketone presence (i.e. double bonded oxygen anywhere in the middle of the chain)
2. count longest root with the ketone (considering that there are no other functional groups of higher priority present)
3. number carbons, giving the ketone priority, taking note of what number it falls on (e.g. carbon 2)
4. identify sub. groups (e.g. fluorine on carbon 4)
5. write full name with ending "-one" (e.g. 4-fluoroheptan-2-one)

ESTER NAMING E.G.

1. begin with the carbon chain attached to the single bonded oxygen (i.e. the alcohol side), identifying its longest chain; name like sub. group (e.g. phenyl).
2. identify the longest chain on the other side of the molecule (i.e. the acid side), identifying its longest chain starting from the carbon that is double bonded to the oxygen (e.g. pentane).
3. identify any sub. groups and number accordingly (e.g. none)
4. write full name with ending "-oate" (e.g. phenyl pentanoate)

group name	*identification*	*suffix*
alk**ane**	only single carbon bonds	-ane
alk**ene**	at least one double carbon bond	-ene
alk**yne**	at least one triple carbon bond	-yne
alcoh**ol**	hydroxyl at the end of chain	-ol
carboxylic acid	COOH group at the end of chain	-oic acid



1. confirm aldehyde presence (i.e. double bonded oxygen at the end of a chain)
2. count longest chain with aldehyde included (considering that no other functional groups of a higher priority are present)
3. begin counting from aldehyde
4. identify sub. groups (i.e. two methyls on carbon 3)
5. write full naming with ending "-al" (e.g. 3,3-dimethyloctanal)

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