

Prefixes & Suffixes

Prefixes			Suffixes		Generic Formulae		
C	Meth-	C ₅ Pent-	C ₈ Oct-	Single bond	-ane	-ane	C _n H _{2n+2}
C ₂	Eth-	C ₆ Hex-	C ₉ Non-	Double	-ene	-ene	C _n H _{2n}
C ₃	Prop-	C ₇ Hept	C ₁₀ Dec-	Triple	-yne	-yne	C _n H _{2n-2}
C ₄	But-						

Naming Alkanes with Alkyl Substituents

- Establish base name from longest chain of carbons.
- Number carbons starting at end closest to any alkyl substituent.
- For each alkyl group, specify name of the group (from the note below) and its location by carbon number.
- If an alkyl group occurs more than once, attach a prefix to its name: *di-* for two, *tri-* for three, etc.
- List the alkyl groups in alphabetical order (ignoring any prefixes).

Alkyl Substituent Names

- Alkyl substituents are named by combining a standard prefix (above) with the suffix *-yl*.
Thus: *methyl, ethyl, etc.*
- There are some substituents with special names:



Functional Groups

In the general formulae below, *R* represents a chain of one or more carbon atoms.

Class	Functional Group	Naming notes
Alcohol	$R-OH$	Replace -e with -ol; e.g., 2-butanol
Aldehyde	$R-\overset{O}{\parallel}C-H$	Replace terminal -e with -al, as in propanal
Amine	$R-NH_2$	Treat the NH_2 as a substituent with the prefix "amino" (with no hyphen). e.g., 2-aminobutane
Carboxylic acid	$R-\overset{O}{\parallel}C-OH$	Replace -e with -oic acid; the group is at the end of the C chain, so there's no location number. e.g., propanoic acid
Ester	$R-\overset{O}{\parallel}C-O-R'$	Name the R' group (on the oxygen side) as a substituent and the R group with -e replaced with -oate. e.g., methyl propanoate.
Ether	$R-O-R'$	Common naming: name the alkanes to both sides of the O (in alphabetical order) followed by "ether." e.g. ethyl methyl ether.
Halohydrocarbon	$R-X$	The halogen is named as a named substituent with an -o suffix but no hyphen. e.g., 3-chloropentane.
Ketone	$R-\overset{O}{\parallel}C-R$	Replace -e with -one; use number to identify location of functional group. e.g., 2-butanone

Benzenes with substituents

- Name as usual, with numbers identifying the location of multiple substituents.
- The first substituent is given position number 1; other positions are numbered clockwise from there.
- When the benzene ring is itself a substituent, it is given the name "phenyl."

Alternative naming systems

- An alternative naming system uses prefixes to indicate the position of two-substituent benzenes:
 - ▶ *Ortho-* (*o-*) if the two substituents are adjacent.
e.g., 1,2- dimethylbenzene can also be called orthodimethylbenzene or o-dimethylbenzene
 - ▶ *Meta-* (*m-*) if they are separated by a single carbon (e.g., metadimethylbenzene)
 - ▶ *Para-* (*p-*) if they are opposite each other (e.g., paradimethylbenzene).
- ▶ Certain specific benzenes have common names, separate from their systemic names:

