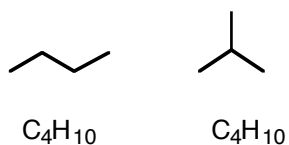


# Nomenclature

1. R-CH<sub>3</sub> Methyl      R-CH<sub>2</sub>-R methylene  
homologs - compounds that are different by one CH<sub>2</sub>

Saturated Alkanes have formulas of C<sub>n</sub>H<sub>2n+2</sub>



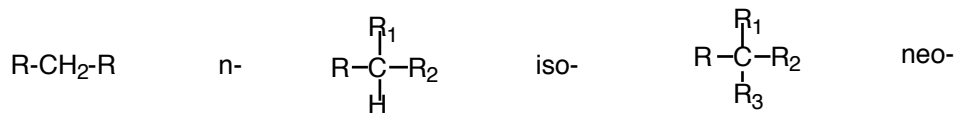
## 2. Nomenclature-of alkanes

- a) Straight chain- n in front (normal) and -ane ending

C	Name	C	Name
1	Methane	6	Hexane
2	Ethane	7	Heptane
3	Propane	8	Octane
4	Butane	9	Nonane
5	Pentane	10	Decane

Greek prefix- (number of C) + -ane

- b) Branching- (trivial names)



Ex.



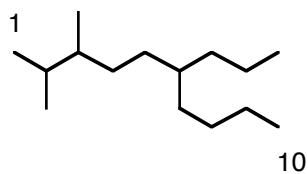
b) If the same alkyl group appears twice or more than use the prefixes.

di- 2                      penta- 5

tri- 3                      hexa- 6

tetra- 4

4-ethyl-3-methylheptane

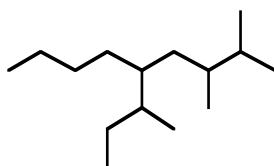


2,3-dimethyl-6-propyldecane

Common names to alkyl substituents-

	<u>Name</u>
$-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$	n-butyl
$-\text{CH}_2\text{CH}(\text{CH}_3)_2$	iso-butyl
$-\text{CHCH}_3\text{CH}_2\text{CH}_3$	sec-butyl
$-\text{C}(\text{CH}_3)_3$	tert-butyl
$-\text{CH}(\text{CH}_3)_2$	iso-propyl

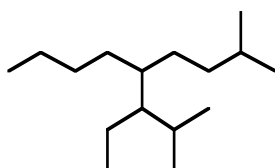
EX.



5-secbutyl-2,3-dimethylnonane

Complex substituents-

Name as usual but set off with parenthesis.



2-methyl-(1-ethyl-2-methylpropyl)-2-methylnonane

Cyclic Alkanes-

a) **cyclo-** name



cyclopropane

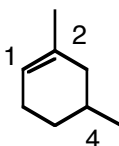
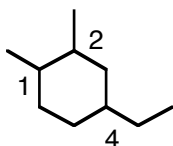


cyclobutane

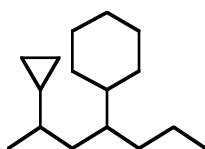


cyclopentane

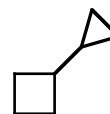
b) Number rings so substituents have the lowest number. (for 3 or more groups on a ring). If 2 groups put in alphabetical order. Incorporate higher priority functional groups into the numbering.



c) If alkyl chain is longer, name as a substituent.



4-cyclohexyl-2-cyclopropylheptane

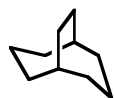
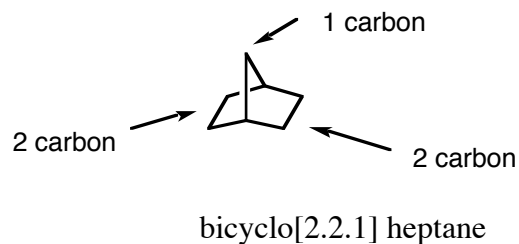


cyclopropyl-cyclobutane

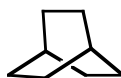
d) Polycyclic systems-

Name the total number of carbons then add bicyclo-prefix

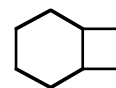
Count the number of bridging carbons-



bicyclo[3.3.2]decane



bicyclo[2.2.2]octane



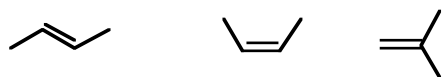
bicyclo[4.2.0] octane

Carbon makes four bonds (all single bonds) to form a tetrahedral shape. Have free rotation around the single bonds but have preferred conformation.

Alkenes- double bond, alkynes triple bond.- show geometry of the bonds, retinol.  
Show structure of double bond- no free rotation in space.

Can have stereoisomers- same atom-atom connectivity but different arrangement in space.

Ex.



Same side of the double- cis

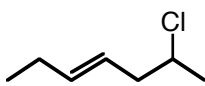
Opposite -trans

Two identical groups on 1 carbon neither cis or trans

EX.

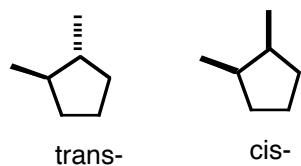


cis-3-hexene

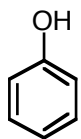
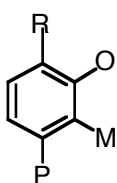


*trans*-6-chloro-3-heptene

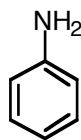
Also for cycloalkanes- restricted rotation.



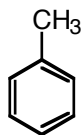
Aromatic nomenclature- Add benzene.



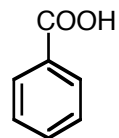
phenol



aniline



toluene

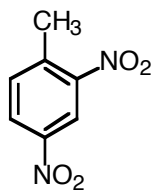


benzoic acid

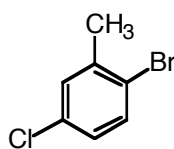


benzene  
(phenyl)

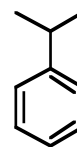
Ex.



2,4-dinitrotoluene

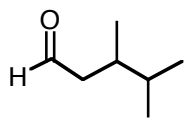


2-bromo-5-chlorotoluene

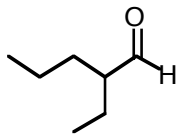


isopropyl benzene

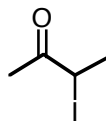
**4.Nomenclature of functional groups-** Show functional groups- specific arrangement of atoms that gives rise to certain reactivity.



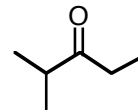
3,4-dimethylpentanal



2-ethylpentanal



3-iodobutanone



2-methyl-3-pentanone