Systematic Nomenclature

RULES:

- 1. Find the longest chain
- 2. Number from end of the chain, so that the 1st branch point has the lowest number
- 3. Name the chain, then add prefixes (for the groups attached) with number and name the groups attached
- 4. Separate numbers and names by dash



Note: iso = second-to-last carbon of the chain is disubstituted (2 methyl groups) neo = second-to-last carbon of the chain is trisubstituted (3 methyl groups)

Prefixes for naming: Di (2), Tri (3), Tetra (4), Penta (5), Hexa (6) etc.

Naming Examples:





2,3,3-trimethylpentane

3,5-diethyl-4-methyloctane

Cycloalkanes:

General Molecular Formula of Alkanes

- No rings: general formula is C_NH_{2N+2}
- Each deviation of 2 hydrogens from the $C_{\rm N}H_{\rm 2N+2}$ formula is a degree of unsaturation
- Cylcoalkanes always have at least 1 degree of unsaturation

e.g.

- $\circ~1$ Degree of unsaturation : $C_{N}H_{2N}~$ Alkanes with one ring or double bond
- $\circ~2$ Degrees of unsaturation : $C_{\rm N}H_{\rm 2N\text{-}2}~$ Alkanes with two rings or double bonds, or one each

Note: Ring Structure Naming

- Prefix with "cyclo"
- Start with numbering at point of maximum branching/most important functional group
- Number so as to give next branch/functional group lowest number

Cyclopropane, C₃H₆



- One degree of unsaturation (*n*-propane is C₃H₈)
 Not a structural isomer (different molecular formula)
- C-C-C bond angle (60°)
- Highly reactive due to ring strain







Cyclopentane, C₅H₁₀







General Molecular Formula of Alkanes

- No rings: general formula is C_NH_{2N+2}
- Each deviation of 2 hydrogens from the C_NH_{2N+2} formula is a degree of unsaturation
- 1 Degree of unsaturation : C_NH_{2N} Alkanes with one ring or double bond
- 2 Degrees of unsaturation : C_NH_{2N-2} Alkanes with two rings or double bonds, or one each

Examples of Naming Cycloalkanes:

Degree of Unsaturation= 2



1-Cyclopropylcyclohexane



Degree of Unsaturation= 1

7-cyclopropyl-4-ethyl-2-methyldecane



Degree of Unsaturation= 2

1-Cyclobutyl-3-ethyl-1-methylcyclopentane