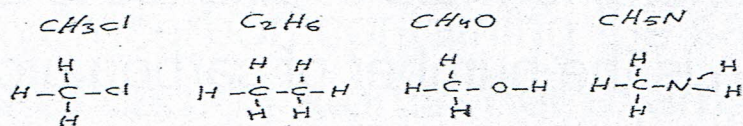
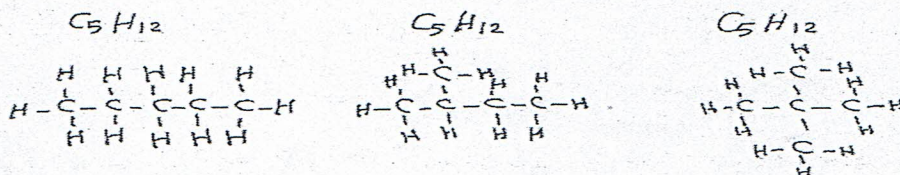


Alkanes and Cycloalkanes

Structural Formulas






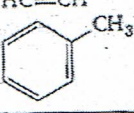
Structural Isomers



Compounds that have the same chemical formulas but differ in their structural formulas are called Structural Isomers

Functional Groups

- The chemical reactions of organic compounds occurred at specific sites in the molecules. These sites usually contained specific atoms or groups of atoms bonded to carbon. These groups at which reactions occur are called functional group.

Functional Group	Class of Compound	Example
	Alkene	$\text{H}_2\text{C}=\text{CH}_2$
	Alkyne	$\text{HC}\equiv\text{CH}$
	Aromatic	

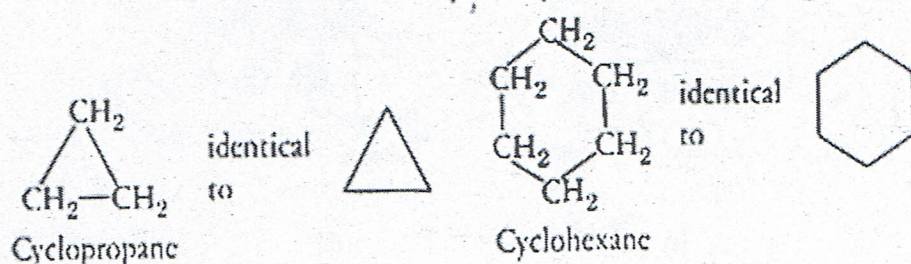
Alkanes

The general formula of alkanes is C_nH_{2n+2}
Where n is the number of carbon atoms in the molecule.

Naming Alkanes and Cycloalkanes

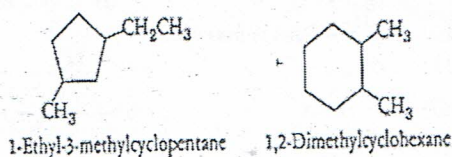
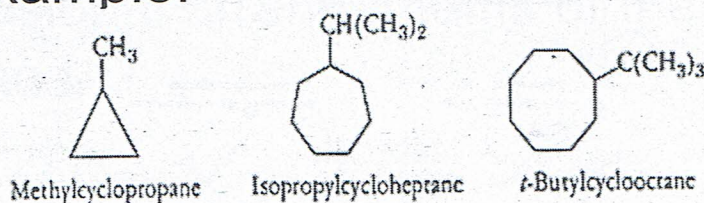
- Saturated hydrocarbons can also exist as rings. Cyclic compounds of carbon containing only single bonds are called Cycloalkanes. If the compounds contain only one ring, they have the general formula C_nH_{2n}

Cycloalkanes are named by adding the prefix cyclo- to the name of the straight – chain hydrocarbon containing the same number of carbon atoms. For example

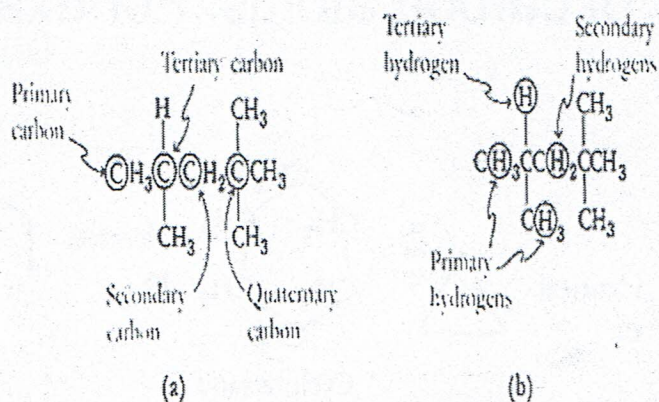


All the carbon atoms of a cycloalkane are equivalent. Therefore, no number prefix is needed for monosubstituted cycloalkanes.

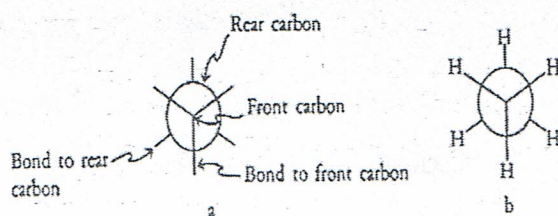
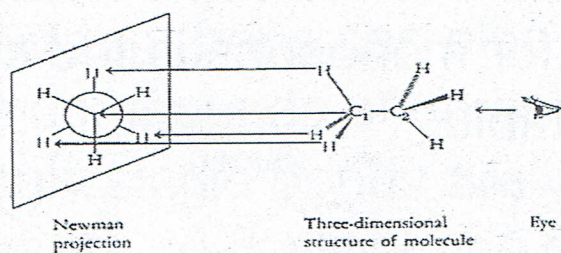
For example:



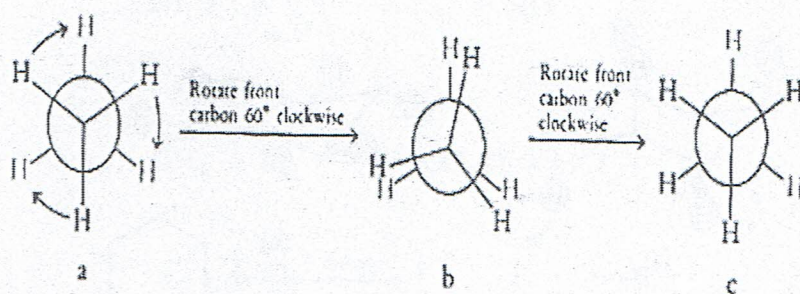
A carbon atom is designated:
 primary, secondary, or tertiary according to
 the number of carbon atoms bonded to it.



Conformational Isomers

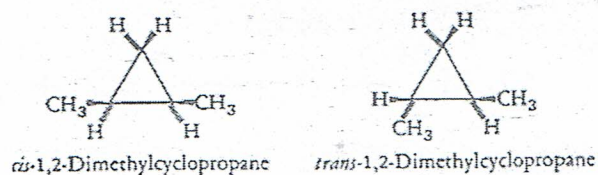
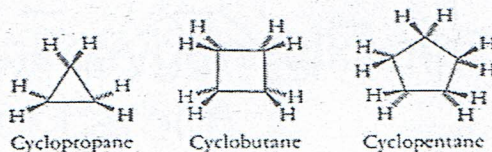


The different arrangements of atoms achieved by rotation about single bonds are called **Conformations**

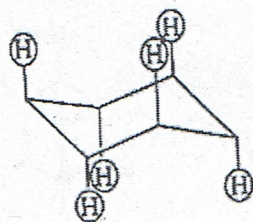


Geometric Isomers

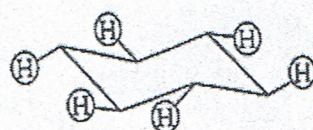
Molecules that differ in the three – dimensional arrangements of their atoms in space.



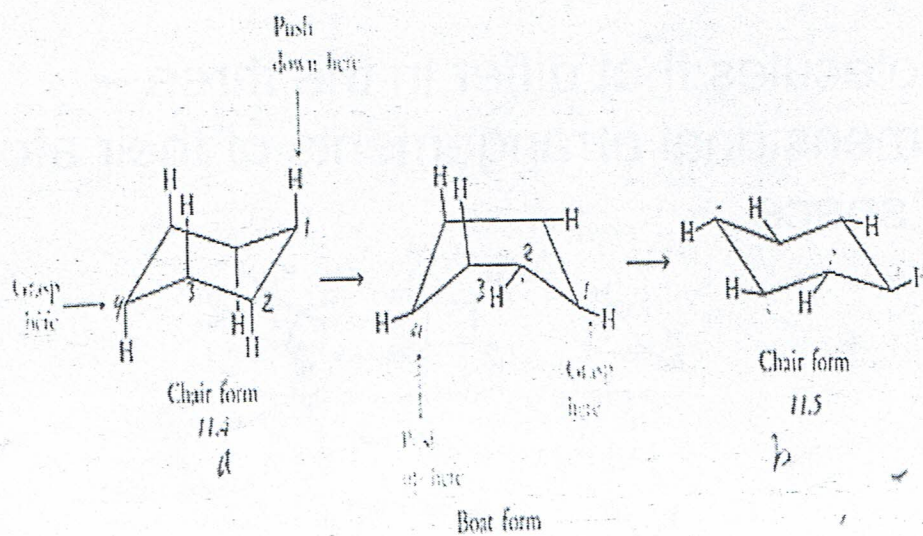
Rings containing six or more carbon atoms are not flat. **Cyclohexane** is an example



(a)

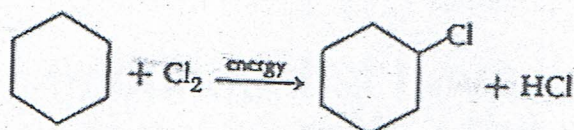
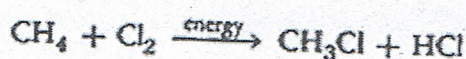
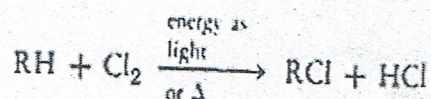


(b)

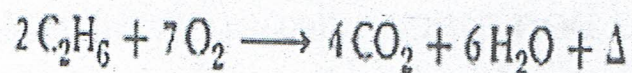


Chemical Reactions

- Chlorination



Oxidation: In the presence of excess oxygen, alkanes burn to form carbon dioxide, water and energy



If insufficient oxygen, alkanes form carbon monoxide or carbon



