

# CARBON AND ITS COMPOUNDS

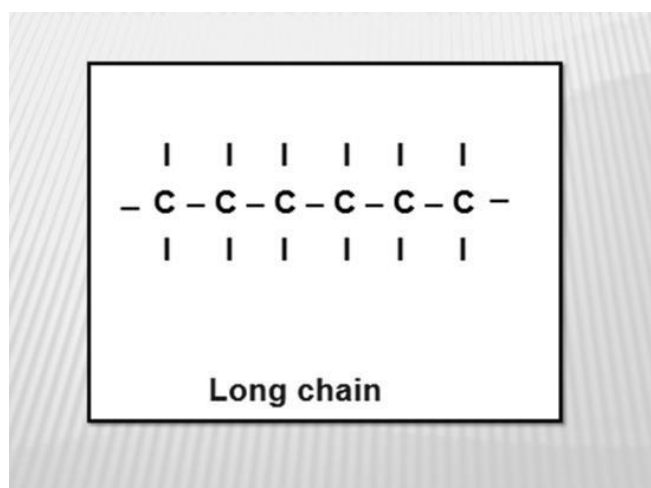
Class X Science

## MODULE 3/3 – HANDOUT

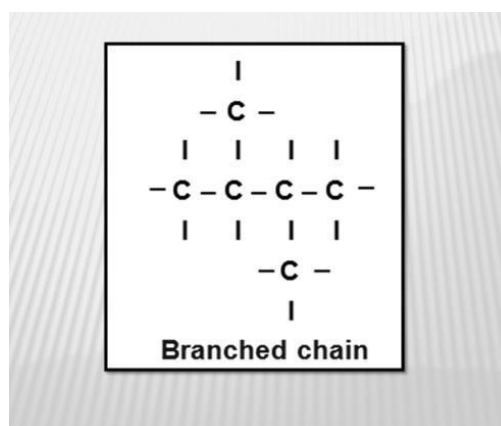
### Chains, Branches and Rings

There are three types of chains, branches and rings :

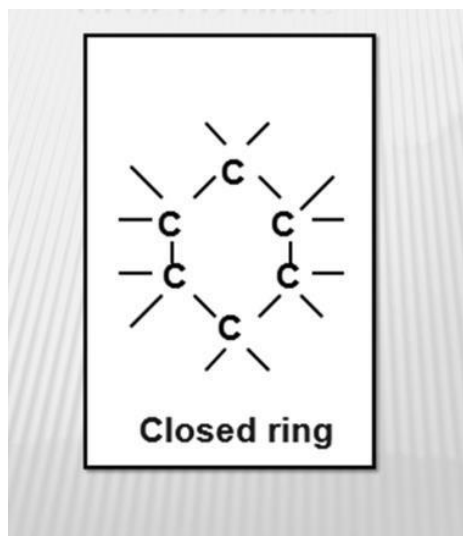
i) Long Chain



ii) Branched chain



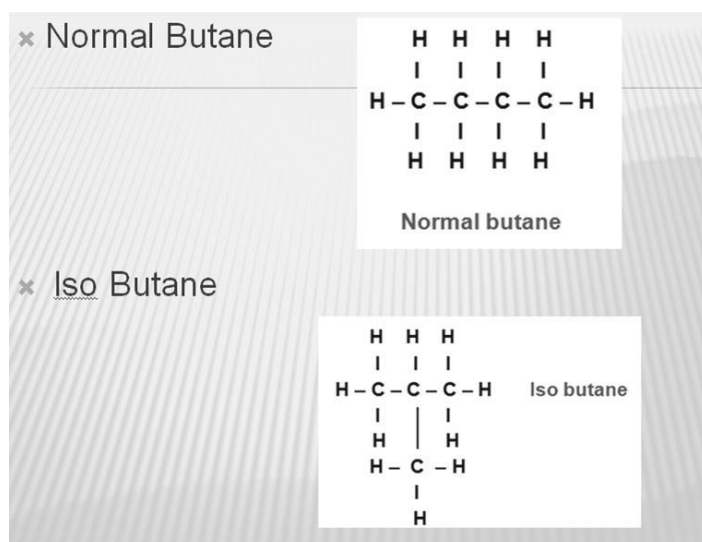
### iii) Closed rings



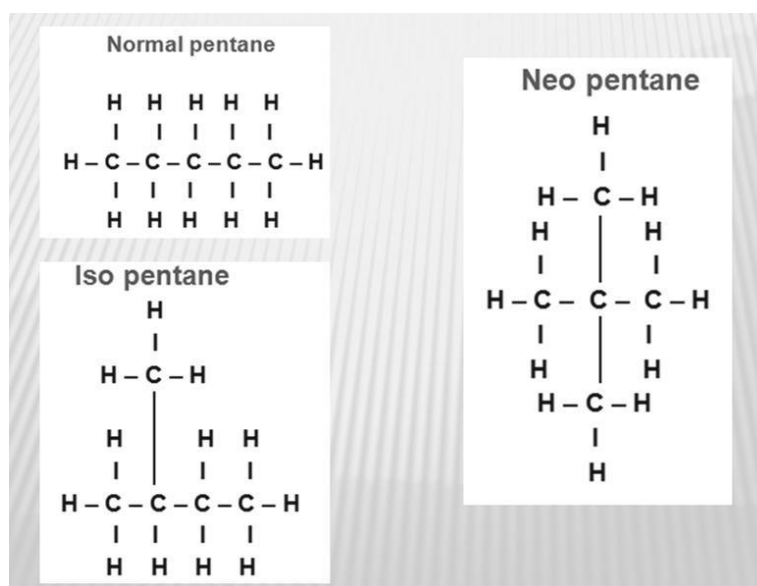
## ISOMERISM:

Carbon compounds having the same molecular formula but different structural formulae are called isomers. This property is called isomerism.

Eg: Butane –  $C_4H_{10}$  has 2 isomers. They are Normal butane and Iso butane.

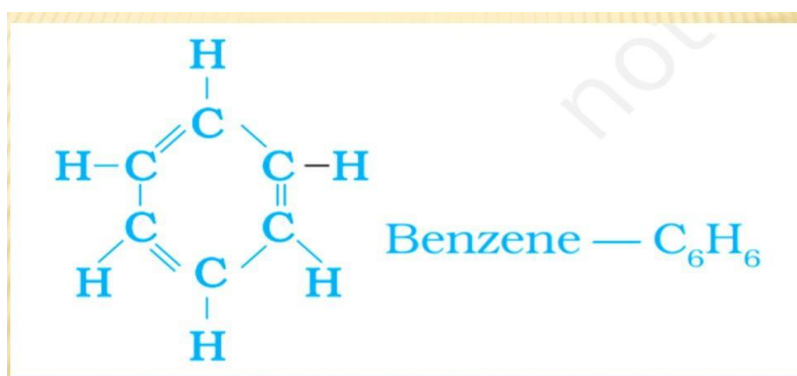
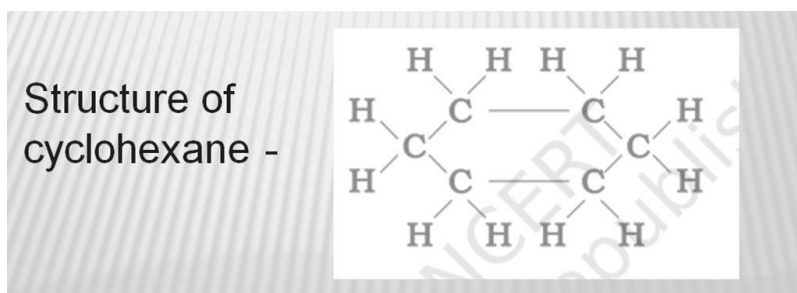


Pentane –  $C_5H_{12}$  has 3 isomers. They are Normal pentane, Iso pentane and Neo pentane.



## CLOSED RINGS:

In addition to straight and branched carbon chains, some compounds have carbon atoms arranged in the form of a ring. For example, cyclohexane has the formula  $C_6H_{12}$



## HOMOLOGOUS SERIES:

Homologous series is a group of carbon compounds having similar structures, similar chemical properties and whose successive members differ by a  $\text{-CH}_2$  group. Eg: Alkanes, Alkenes and Alkynes etc.

Alkanes :- have general molecular formula  $\text{C}_n\text{H}_{2n+2}$  . Their names end with – ane and the members are as follows:-

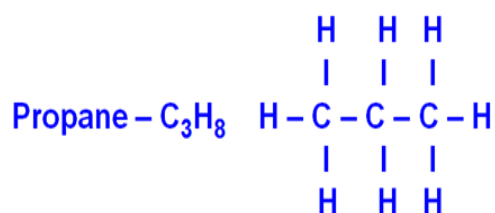
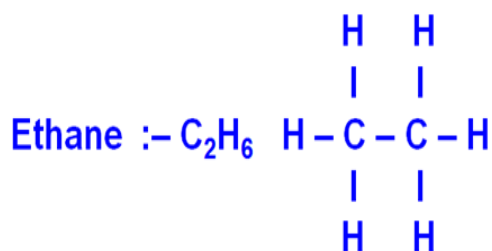
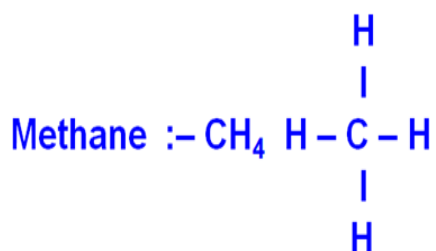
I) Methane -  $\text{CH}_4$

IV) Butane -  $\text{C}_4\text{H}_{10}$

II) Ethane -  $\text{C}_2\text{H}_6$

V) Pentane -  $\text{C}_5\text{H}_{12}$

III) Propane -  $\text{C}_3\text{H}_8$



## ALKENES:

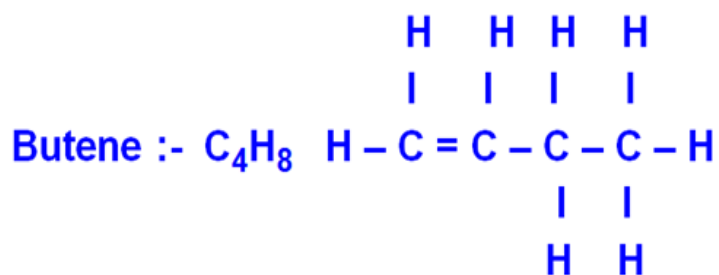
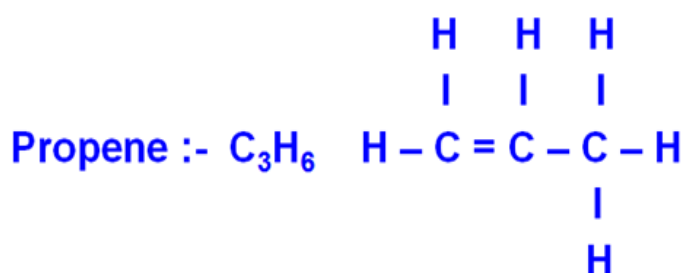
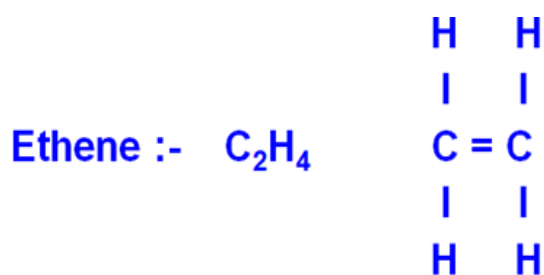
Alkenes have general molecular formula  $C_nH_{2n}$ . Their names end with –ene and the members are as follows:-

Ethene -  $C_2H_4$

Propene -  $C_3H_6$

Butene -  $C_4H_8$

Pentene -  $C_5H_{10}$



## ALKYNES:

Alkynes have general molecular formula  $C_nH_{2n-2}$

.Their names end with – yne and the members are as follows :-

Ethyne -  $C_2H_2$

Propyne -  $C_3H_4$

Butyne -  $C_4H_6$



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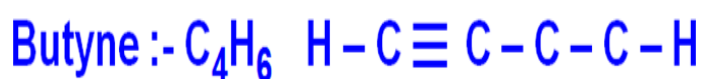


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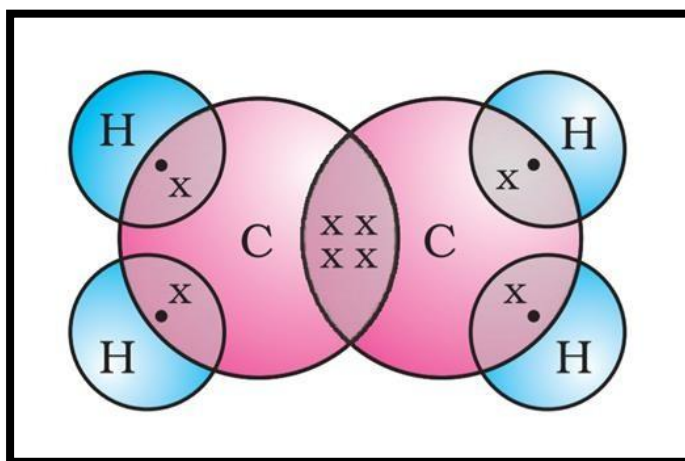
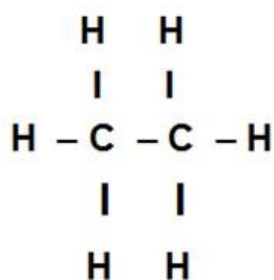
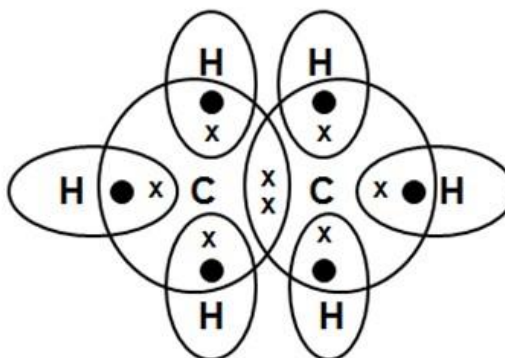
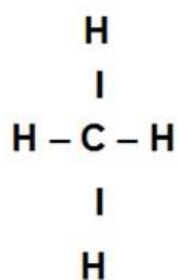
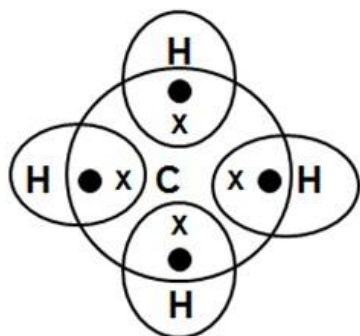
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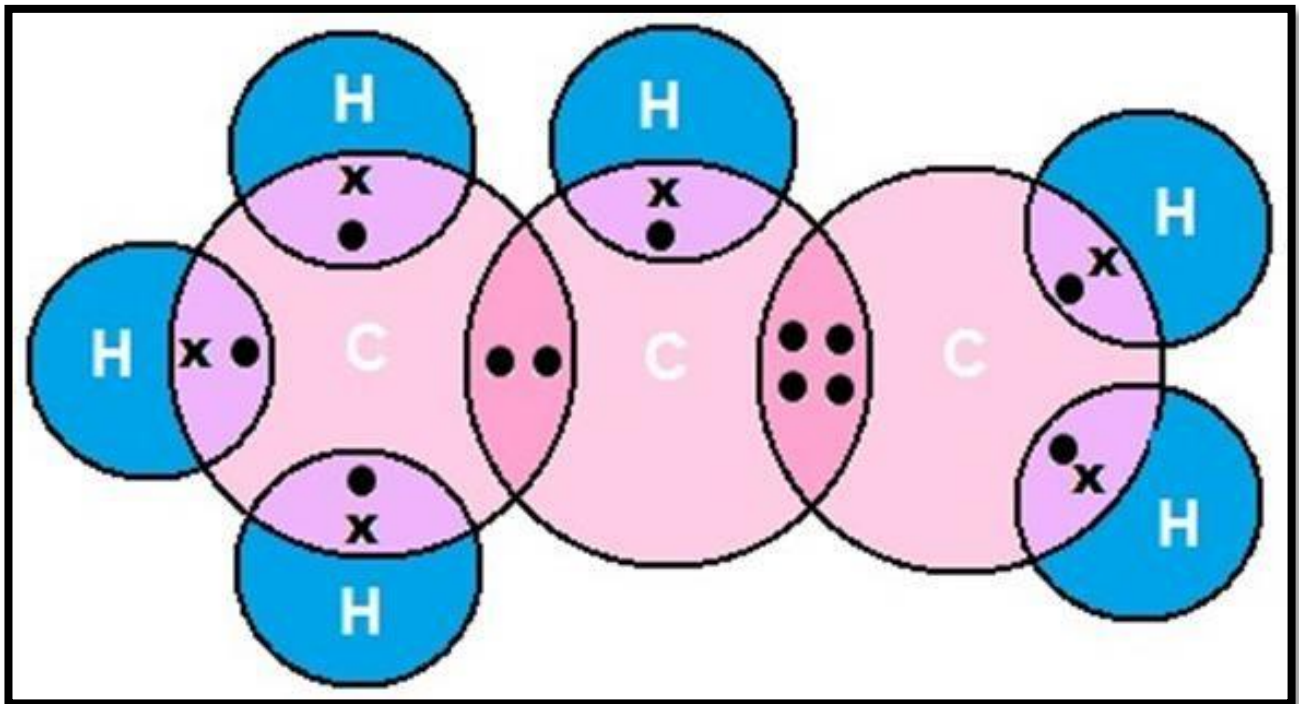
## ELECTRON DOT STRUCTURES:

Methane molecule – CH<sub>4</sub>

Ethane molecule – C<sub>2</sub>H<sub>6</sub>



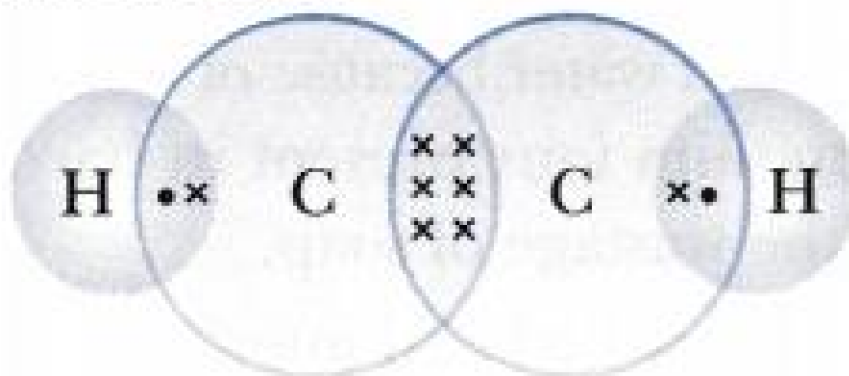
Electron Dot Structure of Ethene



Electron Dot Structure of Propene

### Ethyne

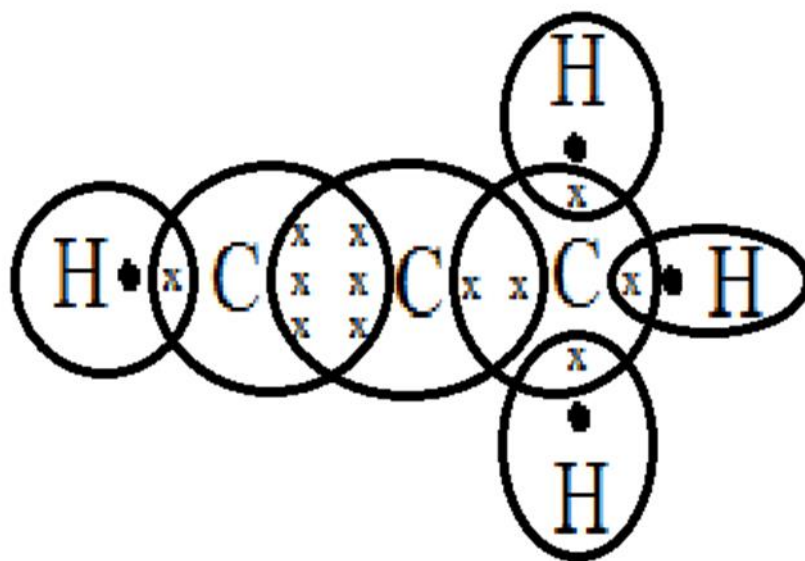
**Electron-dot structure:**





# ELECTRON DOT STRUCTURES

## PROPYLENE C<sub>3</sub>H<sub>4</sub>



## PROPYLENE

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