



STD 10 – FIRST BELL 2.0– CHEMISTRY – CLASS – 39

CHAPTER- 6

NOMENCLATURE OF ORGANIC COMPOUNDS AND ISOMERISM

Alkane

- The open chain hydrocarbons having only a single bond between the carbon atoms are included in the Alkane category.
- In alkane, as all the four valencies of each carbon atom are single bonds, they are known as **saturated hydrocarbons**.

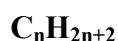
Structure of Carbon	Structure of Alkane	Condensed formula	Molecular formula
1	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{H} \end{array}$	CH ₄	CH ₄
2	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{H} \end{array}$	CH ₃ -CH ₃	C ₂ H ₆
3	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$	CH ₃ -CH ₂ -CH ₃	C ₃ H ₈
4	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ \quad \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \end{array}$	CH ₃ -CH ₂ -CH ₂ -CH ₃	C ₄ H ₁₀

5	$ \begin{array}{ccccccccc} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & & & \\ & & & & & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{H} & & \\ & & & & & & & & \\ & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & & & \end{array} $	$\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$	C_5H_{12}
---	--	---	---------------------------

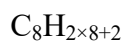
- General formula of alkane is $\text{C}_n\text{H}_{2n+2}$ (n is the number of carbon atom)

Q: What is the molecular formula of Alkane containing 8 carbon atoms?

- General formula of alkane =



$$n = 8$$



Homologous series

- The difference between the molecular formula of any two successive Alkane is CH_2 and can be represented by a general formula. Such series of compounds are called homologous series.

Characteristics of Homologous series

- The members can be represented by a general formula.
- Successive members differ by a $-\text{CH}_2-$ group.
- Members show similarity in chemical properties.
- There is a regular gradation in their physical properties.

Unsaturated Hydrocarbons

- Hydrocarbons having double bond or triple bond between carbon atoms are commonly known as unsaturated Hydrocarbons.
- Hydrocarbons having a double bond between any two carbon atoms are called **Alkenes**.

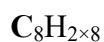
Structure of Carbon	Structure of Alkene	Condensed formula	Molecular formula
2	$ \begin{array}{ccc} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C} = \text{C} & \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array} $	$\text{CH}_2 = \text{CH}_2$	C_2H_4
3	$ \begin{array}{ccc} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C} = \text{C} & \\ & / & \diagdown \\ \text{H} & & \text{C} - \text{H} \\ & & / \quad \backslash \\ & & \text{H} \quad \text{H} \end{array} $	$\text{CH}_2 = \text{CH} - \text{CH}_3$	C_3H_6

4	<pre> H H H \ C = C - C - C - H / H H H H </pre>	$\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_3$	C_4H_8
5	<pre> H H H H \ C = C - C - C - C - H / H H H H H </pre>	$\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3$	C_5H_{10}

- The general formula of Alkene is C_nH_{2n} . (n is the number of carbon atoms)

Q: What are the molecular formulas of alkene containing 9 carbon atoms?

- The general formula of Alkene $=\text{C}_n\text{H}_{2n}$



HOME WORK

1.

NO	Structure of the Hydrocarbons	Condensed formula	Molecular formula
1	$\text{CH}_3-\text{CH}_2-\text{CH}_3$
2	<pre> H H H H - C - C - C - H H H H </pre>
3	$\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_3$

2. Write the molecular formula of an Alkane and Alkene with 7 carbon atoms.

Prepared by:

Sakeena T

HST PS

Iringannur Hss Calicut