

CARBON AND ITS COMPOUNDS

Class X Science

MODULE 2/3 – HANDOUT

VERSATILE NATURE OF CARBON

Carbon forms a very large number of compounds. The number of carbon compounds is more than three million. It is more than the number of compounds formed by all other elements. This is because of :-

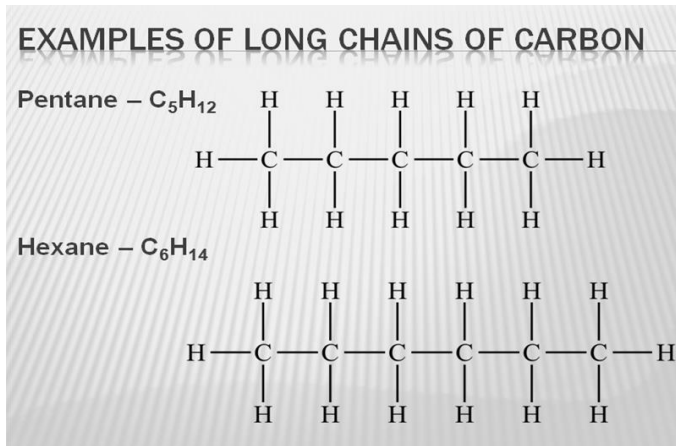
1) TETRAVALENCY:

Since carbon has a valency of four, it is capable of bonding with four other atoms of carbon or atoms of some other mono-valent element. Compounds of carbon are formed with oxygen, hydrogen, nitrogen, sulphur, chlorine, etc.

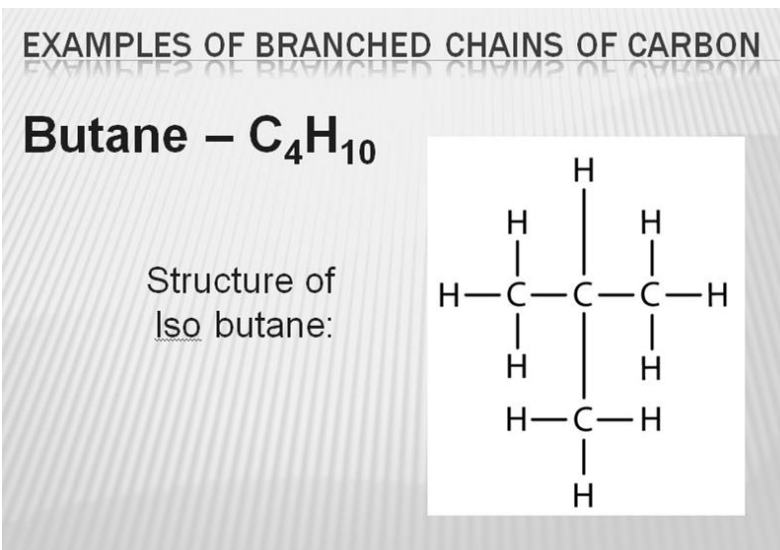
2) CATENATION:

Carbon has the unique ability to form bonds with other atoms of carbon, giving rise to large molecules. This property is called catenation. This results in the formation of:

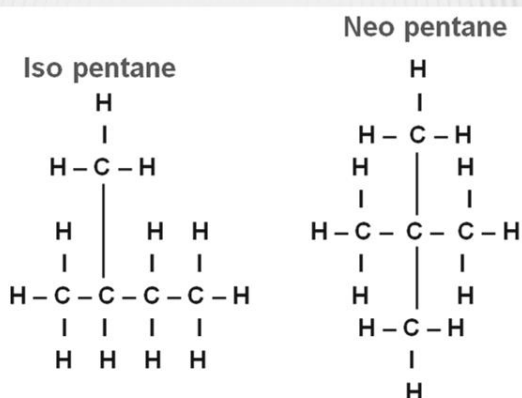
a) Long chains of carbon



b) Branched chains of carbon



PENTANE – C₅H₁₂

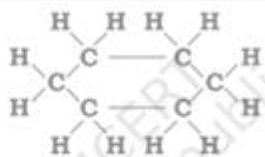


c) Carbon atoms arranged in rings

EXAMPLES OF CARBON ATOMS ARRANGED IN RINGS

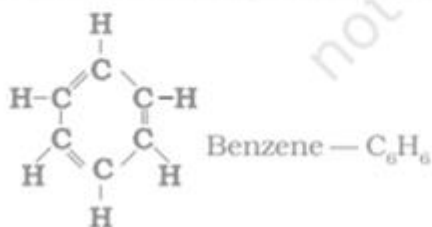


(a)



(b)

Structure of cyclohexane (a) carbon skeleton (b) complete molecule



Benzene – C₆H₆

Structure of benzene

HYDROCARBONS:

Hydrocarbons are compounds containing carbon and hydrogen atoms.

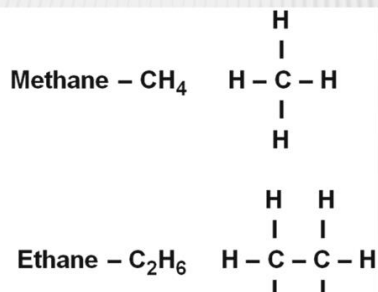
Types of Hydrocarbons:

a) **Saturated Hydrocarbons** – are hydrocarbons having all single covalent bonds between the carbon atoms.

Eg:-

Alkanes:

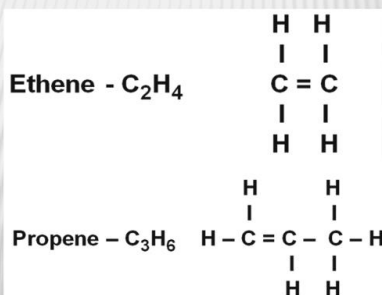
have all single bonds between the carbon atoms and their names end with – ane.



b) **Unsaturated Hydrocarbons** – are hydrocarbons having a double or triple covalent bond between two carbons.

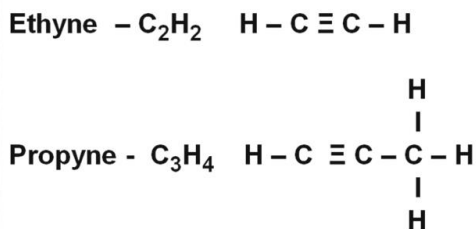
E.g. : i) Alkenes:

have a double covalent bond between two carbon atoms and their names end with – ene.



ii) Alkynes:

have a triple covalent bond between two carbon atoms and names end with – yne.



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