CLASS 10 - SCIENCE

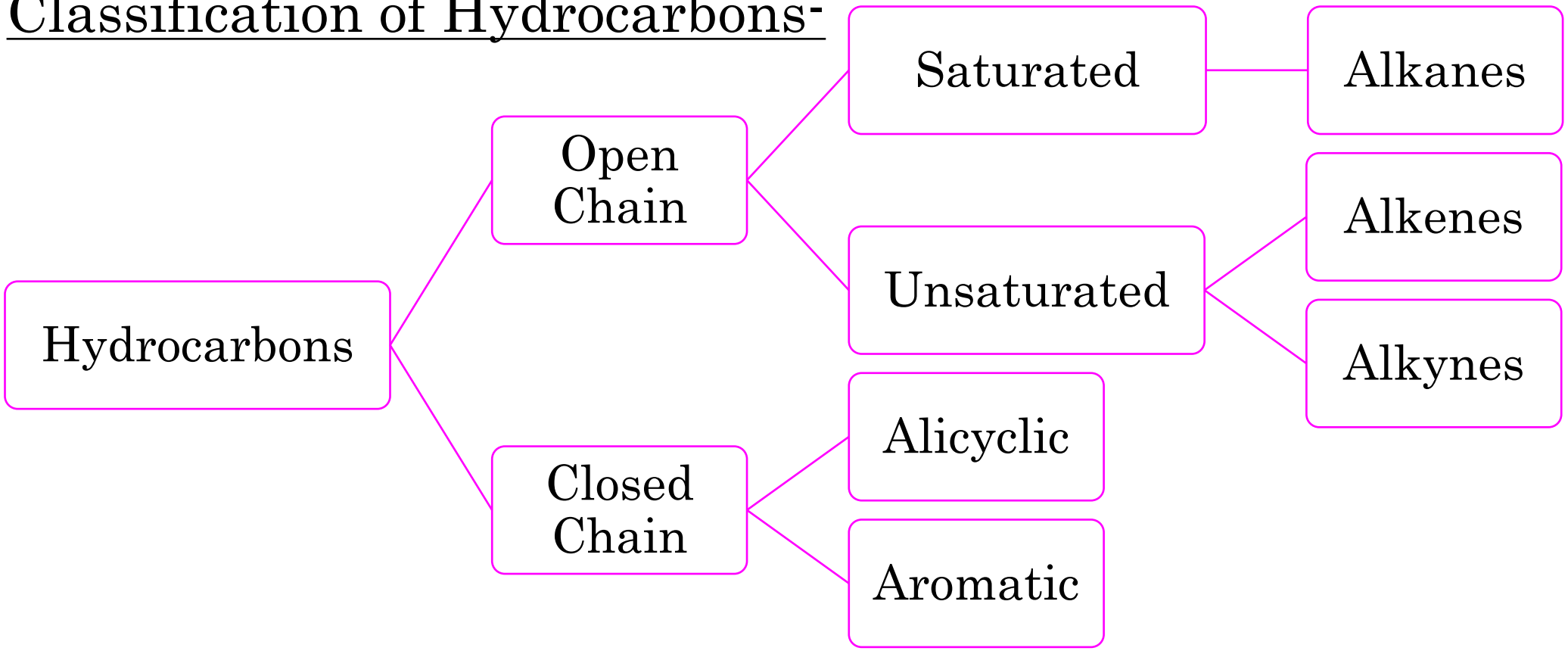
CHAPTER 4 - CARBON AND ITS COMPOUNDS

PART 4 - HYDROCARBONS

HYDROCARBONS

Definition- All the carbon compounds which contain only carbon and hydrogen are called hydrocarbons.

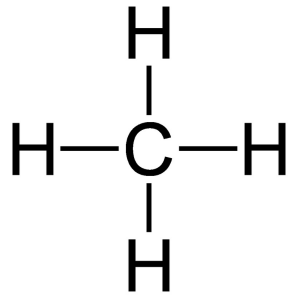
Classification of Hydrocarbons-

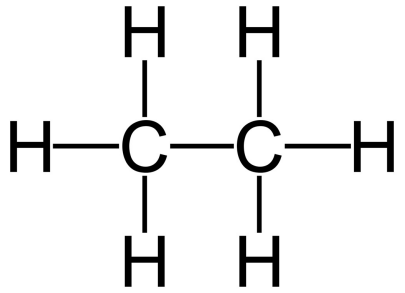


OPEN CHAIN HYDROCARBONS

1) Saturated Hydrocarbons

- They are straight chain carbon compounds containing only single covalent bonds.
- Also known as Alkanes
- General formula is C_nH_{2n+2} (where n is the number of carbon atoms)
- Examples- Methane CH_4, Ethane C_2H_6 etc.

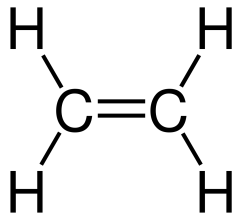


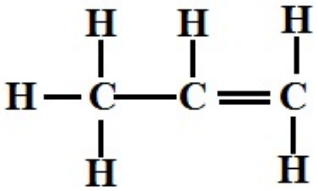


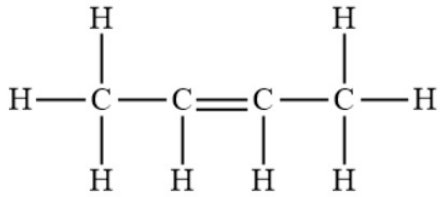
OPEN CHAIN HYDROCARBONS (contd…)

2) Unsaturated Hydrocarbons

- They are straight chain carbon compounds containing double or triple covalent bonds.
- Classified into two types- Alkenes and Alkynes
- Alkenes- The hydrocarbons with a double bond between carbon atoms are known as alkenes.
- General formula is C_nH_{2n}
- Examples- Ethene C_2H_4, Propene C_3H_6, Butene C_4H_8

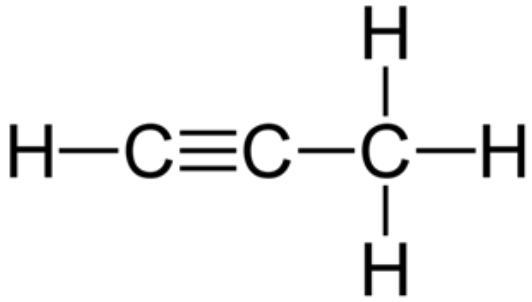


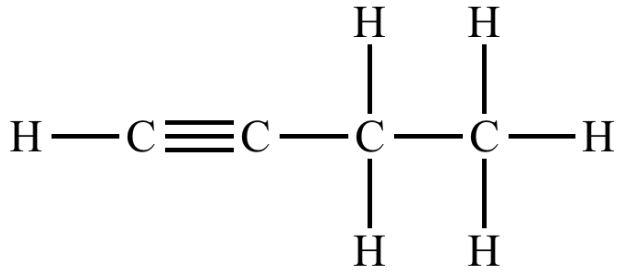




OPEN CHAIN HYDROCARBONS (contd…)

- Alkynes- The hydrocarbons with a triple bond between carbon atoms are known as alkynes.
- General formula is C_nH_{2n-2}
- Examples- Ethyne C_2H_2, Propyne C_3H_4, Butyne C_4H_6



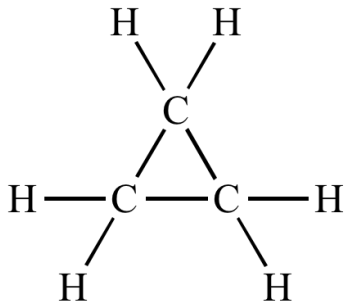


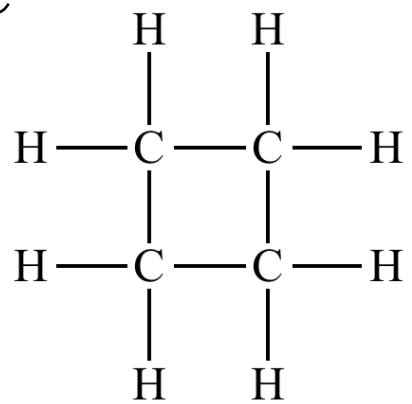
OPEN CHAIN HYDROCARBONS (easy way to learn)

Alkanes		Alkenes		Alkynes	
Name	Formula	Name	Formula	Name	Formula
Methane	CH_4	-	-	-	-
Ethane	C_2H_6	Ethene	C_2H_4	Ethyne	C_2H_2
Propane	C_3H_8	Propene	C_3H_6	Propyne	C_3H_4
Butane	C_4H_{10}	Butene	C_4H_8	Butyne	C_4H_6
Pentane	C_5H_{12}	Pentene	C_5H_{10}	Pentyne	C_5H_8
Hexane	C_6H_{14}	Hexene	C_6H_{12}	Hexyne	C_6H_{10}
Heptane	C_7H_{16}	Heptene	C_7H_{14}	Heptyne	C_7H_{12}
Octane	C_8H_{18}	Octene	C_8H_{16}	Octyne	C_8H_{14}
Nonane	C_9H_{20}	Nonene	C_9H_{18}	Nonyne	C_9H_{16}
Decane	$C_{10}H_{22}$	Decene	$C_{10}H_{20}$	Decyne	$C_{10}H_{18}$

CYCLIC/ CLOSED CHAIN HYDROCARBONS

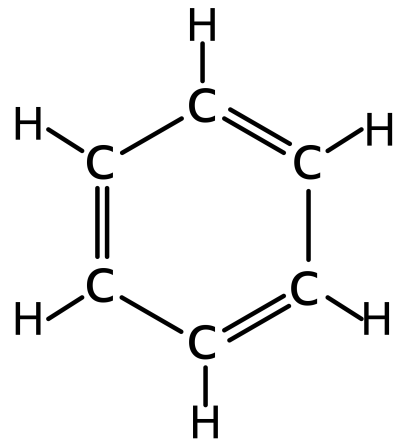
- The compounds of carbon which contain a closed ring of carbon atoms are called cyclic hydrocarbons.
- Two types are- Alicyclic and Aromatic
- Alicyclic- The hydrocarbons in which three or more carbon atoms are linked together in the form of a ring or cycle are called alicyclic hydrocarbons.
- Examples- Cyclopropane, Cyclobutane





CYCLIC/ CLOSED CHAIN HYDROCARBONS (contd..)

- Aromatic- The aromatic hydrocarbons are the unsaturated hydrocarbons which have one or more planar six-carbon closed rings to which hydrogen atoms are attached.
- These compounds have at least one conjugated ring of alternate single and double bonds with delocalized electrons
- Examples- Benzene is one of the simplest aromatic hydrocarbons with chemical formula C_6H_6.



THANK YOU