



NCERT – GRADE 10 CHEAT SHEET

CARBON AND ITS COMPOUNDS

INTRODUCTION TO CARBON COMPOUNDS

Key Concepts, Functions & Facts at a Glance

Pumpa



1. IMPORTANCE OF CARBON AND ITS COMPOUNDS

- Carbon is the basis of all known life.
- It forms a very large number of compounds.
- Carbon compounds are the main constituent of fuels, food, medicines, plastics, synthetic fibres, dyes, detergents and many more.
- They are used in everyday life in different forms.
- They make human life comfortable and convenient.



2. IONIC BONDS vs COVALENT BONDS IN CARBON COMPOUNDS

IONIC BOND

- Formed by complete transfer of electron(s) from one atom to another.
- Usually between a metal and a non-metal.
- Strong electrostatic attraction between oppositely charged ions.
- High melting and boiling points.
- Conduct electricity in aqueous solution or molten state.

COVALENT BOND (in carbon compounds)

- Formed by sharing of electron(s) between atoms.
- Usually between non-metals.
- Weak intermolecular forces between molecules.
- Generally low melting and boiling points.
- Do not conduct electricity.

ELECTRON DOT STRUCTURES (EXAMPLES)

Ionic Bond

Sodium chloride (NaCl)

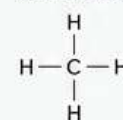


Magnesium oxide (MgO)

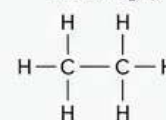


Covalent Bond

Methane (CH₄)



Ethane (C₂H₆)

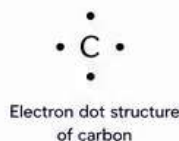


(Each line represents a shared pair)

3. SPECIAL FEATURES OF CARBON

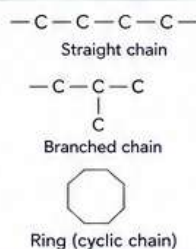
(i) Tetravalency

- Carbon has 4 valence electrons (2,4).
- It can form four covalent bonds with other atoms.
- This allows carbon to form a large number of compounds.



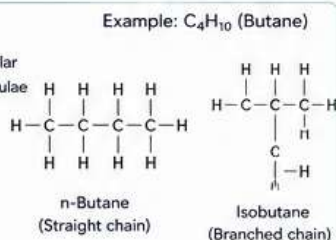
(ii) Catenation

- Carbon atoms can bond with each other to form long chains, branched chains and rings.
- This property is called catenation.
- It is the basis for the huge variety of carbon compounds.



(iii) Isomerism

- Compounds with the same molecular formula but different structural formulae are called isomers.
- They have different properties.

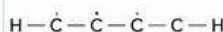


4. CLASSIFICATION OF ORGANIC COMPOUNDS

A. Based on the Pattern of Carbon Chains

(i) Straight Chain

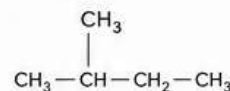
All carbon atoms are linked in a straight sequence.



(n-Butane)

(ii) Branched Chain

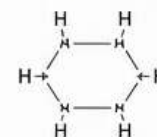
One or more carbon atoms are attached to other carbon atoms in the main chain.



(Isobutane)

(iii) Cyclic Chain

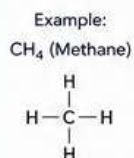
The carbon atoms are joined to form a ring.



B. Based on the Types of Atoms Present

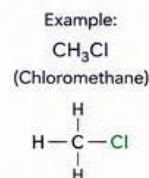
(i) Hydrocarbons

Contain only carbon (C) and hydrogen (H).



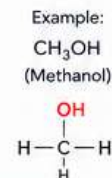
(ii) Halo Compounds

Contain carbon, hydrogen and halogens (Cl, Br, I, F).



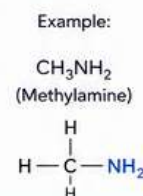
(iii) Oxygenated Compounds

Contain oxygen along with C and H.



(iv) Nitrogen Compounds

Contain nitrogen along with C and H.



QUICK FACTS

- Carbon is the backbone of all known life.
- It can form millions of compounds.
- Carbon shows tetravalency, catenation and isomerism.
- Organic compounds are essential in daily life.

QUICK FORMULAS / STRUCTURES

- Valency of carbon = 4
 - Electronic configuration of carbon = 2,4
 - Example of electron dot structure of carbon:
- $$\begin{array}{c} \cdot \\ \cdot \text{C} \cdot \\ \cdot \end{array}$$
- (Four valence electrons)
- General formula of alkanes (straight chain):
- $$\text{C}_n\text{H}_{2n+2}$$

COMMON MISTAKES

- Thinking carbon has 2 or 3 valencies.
- Confusing ionic and covalent bonds.
- Not drawing correct electron dot structures.
- Ignoring catenation while writing structures.
- Thinking all organic compounds contain oxygen.

COMMON TERMS

- Tetravalency** : Ability of carbon to form four bonds.
- Catenation** : Self-linking property of carbon atoms.
- Isomerism** : Same molecular formula, different structures.
- Organic Compounds** : Compounds of carbon (mostly).
- Hydrocarbon** : Compound of carbon and hydrogen only.



KEY TAKEAWAY: Carbon forms a vast variety of compounds due to its tetravalency, catenation and ability to show isomerism. Understanding types of bonds and classification helps us recognize the importance of carbon compounds in our daily lives.

