

Chapter 4 – Carbon and its Compounds (30 Important Q&A)

Basic Concepts

Q1. Why is carbon unique?

Ans: Carbon forms long chains, rings, and bonds with itself and other elements due to **catenation**.

Q2. What is catenation?

Ans: Ability of an element to form bonds with atoms of the same element.

Q3. Define hydrocarbon.

Ans: Compounds containing only carbon and hydrogen.

Q4. Name two types of hydrocarbons.

Ans: Alkanes (single bonds) and alkenes (double bonds)

Q5. Give an example of an alkane.

Ans: Methane (CH_4)

Functional Groups

Q6. Functional group of alcohols is:

Ans: $-\text{OH}$

Q7. Functional group of carboxylic acids is:

Ans: $-\text{COOH}$

Q8. Functional group of aldehydes is:

Ans: $-\text{CHO}$

Q9. Functional group of ketones is:

Ans: $\text{C}=\text{O}$ (within carbon chain)

Q10. Functional group of esters is:

Ans: $-\text{COO}-$

Important Compounds & Uses

Q11. Formula of ethanol:

Ans: $\text{C}_2\text{H}_5\text{OH}$

Q12. Name a natural source of ethanol:

Ans: Fermentation of sugar by yeast

Q13. Formula of ethanoic acid:

Ans: CH_3COOH

Q14. Uses of ethanol:

Ans: Solvent, fuel, in medicines

Q15. Uses of ethanoic acid:

Ans: Vinegar, manufacturing chemicals

Reactions

Q16. Complete combustion of carbon compounds produces:

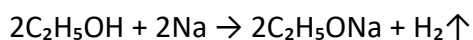
Ans: CO_2 and H_2O

Q17. Incomplete combustion of carbon produces:

Ans: CO and soot (C)

Q18. Reaction of ethanol with sodium metal produces:

Ans: Sodium ethoxide + H_2 gas



Q19. Ethanol + concentrated $\text{H}_2\text{SO}_4 \rightarrow$

Ans: Ethene (C_2H_4) + H_2O

Q20. Ethanoic acid + alcohol \rightarrow

Ans: Ester + H_2O (esterification)

Homologous Series

Q21. Define homologous series.

Ans: A series of compounds with same functional group and similar chemical properties but differ by $-\text{CH}_2$ unit.

Q22. Example of homologous series:

Ans: Alkanes: Methane, Ethane, Propane

Q23. General formula of alkanes:

Ans: $\text{C}_n\text{H}_{2n+2}$

Q24. General formula of alkenes:

Ans: C_nH_{2n}

Q25. Name first three alkanes.

Ans: Methane, Ethane, Propane

Polymers and Soaps

Q26. Define polymer.

Ans: Large molecules formed by repeated combination of small molecules (monomers).

Q27. Give an example of natural polymer:

Ans: Starch, cellulose

Q28. Give an example of synthetic polymer:

Ans: Polyethylene, Nylon

Q29. Difference between soaps and detergents:

Ans: Soaps – natural salts of fatty acids, less effective in hard water

Detergents – synthetic, work in hard water

Q30. Why does carbon form so many compounds?

Ans: Due to catenation, tetravalency, and ability to form stable bonds with H, O, N, Cl, etc.
