

SELF ASSESSMENT TEST SOLUTIONS

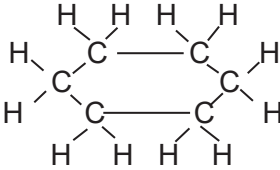
- Covalent compounds are those compounds which are formed by sharing of electrons between two atoms.
 - Covalent compounds are different from ionic compounds because the ionic compounds are formed by the transfer of electrons.
 - Three characteristics of covalent compounds:
 - (i) Generally have low melting and boiling points.
 - (ii) Generally insoluble or less soluble in water but soluble in organic solvents.
 - (iii) Do not conduct electricity.

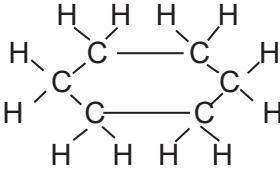
- Series of compounds in which the same functional group substitutes for hydrogen in a carbon chain is called a homologous series.

Characteristics : (i) molecular formulae differ by $-\text{CH}_2$.

(ii) regular gradation in physical properties.

C_3H_6 and C_4H_8 belong to the same homologous series.

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(i) 
 - (a) Incomplete combustion of hydrocarbons or combustion of unsaturated carbon compounds.
 - (b) Complete combustion of hydrocarbons.
 - (iii) CO_2 and H_2O

- Carbon has 4 electrons in its outermost shell. It cannot lose 4 electrons to form C^{4+} because very high energy is required to remove 4 electrons.

It cannot gain 4 electrons to form C^{4-} ions because it is difficult for 6 protons to hold on to 10 electrons.

- Ionic or Electrovalent Bonds.
 - Covalent bonds.
 - There are no charged particles in carbon compounds and hence they are poor conductors of electricity.
- Carbon has 4 electrons in its outermost shell, and needs to gain or lose 4 electrons to attain noble gas configuration.
 - Losing or gaining 4 electrons is not possible due to energy considerations; hence it shares electrons to form covalent bonds.

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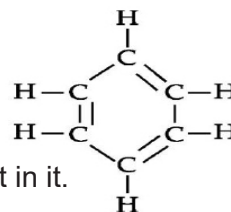
Two reasons for large number of carbon compounds :

- Catenation: The unique ability of carbon to form bonds with other atoms of carbon giving rise to long chains of different types of compounds.
- Tetravalency : Since carbon has a valency of 4, it is capable of bonding with four other atoms of carbon or atoms of elements like oxygen, hydrogen, nitrogen, sulphur, chlorine, etc.

The reason for the formation of strong bonds by carbon is its small size which enables the nucleus to hold on to the shared pairs of electrons strongly.

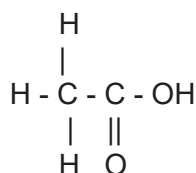
6. I. (a) catenation and tetravalency. (b) fuel doesn't burn completely.

II. X = Benzene / C₆H₆

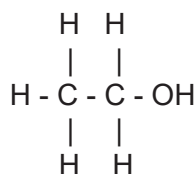


Yes, more reactive because of unsaturation present in it.

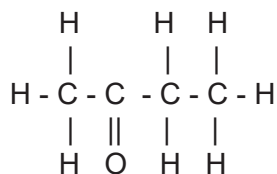
7. (i) Ethanoic acid (CH₃COOH).



(ii) Ethanol (CH₃CH₂OH).



(iii) Ester (CH₃COOC₂H₅).



8. (a) CH₃CH₂O⁻ Na⁺ + H₂ + H₂O (b) CH₂ = CH₂ + H₂O

(c) CH₃COOC₂H₅ + H₂O (d) CH₃COOH

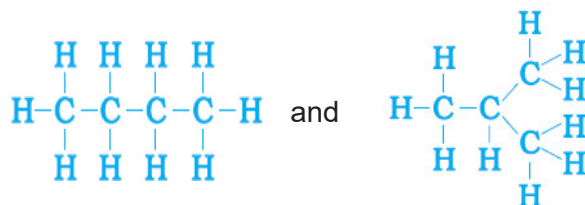
9. (i) Vegetable oil is an unsaturated compound and will decolourise bromine water, while butter (an animal fat) is a saturated compound which does not decolourise the bromine water.

(ii) Ethanoic acid.

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(iii) Soap reacts with magnesium and calcium salts of hard water to form scum.

10. (a) Isomers are compounds having same molecular formula but different structural formula.



b) Oxidation



(c) Ethene

Conc. H₂SO₄ acts as the dehydrating agent.