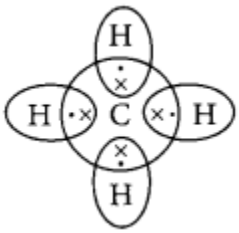
Question 1.
Covalent compounds have low melting and boiling point. Why? (2020)
Answer:
Covalent compounds have low melting and boiling points because the forces of attraction between molecules of covalent compounds are very weak. On applying a small amount of heat these molecular forces break.

Question 2.
What are covalent compounds? Why are they different from ionic compounds? List their three characteristic properties. (Delhi 2016)
Answer:
Covalent compounds are those compounds which are formed by sharing of valence electrons between the atoms e.g., hydrogen molecule is formed by mutual sharing of electrons between two hydrogen atoms.
They are different from ionic compounds as ionic compounds are formed by the complete transfer of electrons from one atom to another e.g., NaCl is formed when one valence electron of sodium gets completely transferred to outer shell of chlorine atom.
The characteristic properties of covalent compounds are:
(i) They are generally insoluble or less soluble in water but soluble in organic solvents.
(ii) They have low melting and boiling points.
(iii) They do not conduct electricity as they do not contain ions.

Question 3.
What are covalent bonds? Show their formation with the help of electron dot structure of methane. Why are covalent compounds generally poor conductors of electricity? (Delhi 2013C)
Answer:
Covalent bonds are those bonds which are formed by sharing of the valence electrons between two atoms. Electron dot structure of methane is shown in the figure.



Covalent compounds are generally poor conductors ol electricity because they do not have tree electrons or ions.

Question 4.
Give reasons for the following:
(i) Element carbon forms compounds mainly by covalent bonding.
(ii) Diamond has high melting point.
(iii) Graphite is a good conductor of electricity. (3/5, Foreign 2011)
Answer:
(i) As carbon has four valence electrons and it can neither loose nor gain lour electrons thus, it attains noble gas configuration only by sharing of electrons. I bus, it forms covalent compounds.
(ii) In diamond, each carbon atom is bonded to four other carbon atoms forming a rigid three-dimensional structure. This makes diamond the hardest known substance. Thus, it has high melting point.
(iii) In graphite, each carbon atom is bonded to three other carbon atoms by covalent bonds in the same plane giving a hexagonal array. Thus, only three valence electrons are used for bond formation and hence, the fourth valence electron is free to move. As a result, graphite is a good conductor of electricity.

Question 5.
What is methane? Draw its electron dot structure. Name the type of bonds formed in this compound. Why are such compounds
(i) poor conductors of electricity and
(ii) have low melting and boiling points?
What happens when this compound burns in oxygen? (Delhi 2019)
Answer:
Methane is the first member of alkane series having formula CH_4.
Refer to answer 3.

(ii) Refer to answer 1.
When methane is burnt in presence of oxygen then carbon dioxide will be produced.
$CH_4 + O_2 \rightarrow CO_2 + H_2O$ + heat + light