CHARACTERISTIC FEATURES OF ORGANIC COMPOUNDS

Covalent Nature: Carbon atoms form stable covalent bonds with one another. A carbon-carbon single covalent bond has energy of $346kJmol^{-1}$. This indicates a strong bond. Most organic compounds are stable because of the strong carbon-carbon bonds. Since they have a covalent nature, they do not ionize in solution and are non-conductors of electricity.

Polarity and Solubility of Non-polar Compounds: Carbon–hydrogen bonds are non-polar like the carbon–carbon bonds. This is because of the almost equal electronegativities of the two elements. Most organic compounds are non-polar unless the compounds consist of very electronegative elements like chlorine or groups like the hydroxyl group. Since most organic compounds are non-polar, they cannot form bonds with water molecules. For example, petrol, kerosene and paraffin oil do not dissolve I water. If an organic compound contains a polar functional group, hydrogen bonds can form between the polar groups in the molecules of the organic compound and the water molecules. This enables the compound to dissolve in water. For example, ethanol is soluble in water. Non-polar substances are held together only by weak intermolecular forces such as the Van der Waal's forces, and so they can intermingle easily. This is why most organic compounds dissolve only in non-polar solvents like benzene or ether.

Low Melting and Boiling Points: Organic compounds generally have lower melting and boiling points than inorganic compounds. This is due to their weak intermolecular bonds. Many of

them (mainly those with low relative molecular masses) tends to be volatile and boil at temperatures below 300°C.

Thermal Instability: Many organic compounds are thermally unstable, decomposing into simpler molecules when heated to temperatures above 500°C. However, this property is sometimes commercially important as in the cracking of petroleum.

Flammability: Most organic compounds are flammable and burn exothermally in a plentiful supply of air to yield carbon (IV) oxide and water. Thus, most fuels such as wood, coal, oil, petrol, and natural gas are organic and their combusting provides our main source of heat energy.

Reactivity: Reactions involving organic compounds tend to be much slower than ionic reactions. They usually require heating, through mixing and catalyst to speed up the reactions.