Chemistry - 12th Class Chemistry Chapter 8 Short Questions Preparation

Q1. Define Hydrogenation,

Ans 1: Hydrogenation is a process in which molecule of hydrogen added to an alkene in the presence of a catalyst and at moderate pressure (1-5 atm) to give a saturated compound.

Q2. Why pie bond is more reactive than alpha bond?

Ans 1: In the formation of pie bond,the partially filled p-orbitals overlap in a parallel fashion,the probability of finding electron is thus away from the line joining the two nuclei,due to this reason pei electron are less fimely helf between the nuclei.

Q3. The sigma bonds are inert in alkanes.Explain?

Ans 1: In the alpha bond the electrons are very tightly held between the nuclei which make it very stable bond,A lot of energy is required to break it.The alkanes or paraffins under ordinary condition are inert towards acid,alkalis,oxidizing and reducing agents.

Q4. How can ethyne be prepared commercially from calcium carbide?

Ans 1: On industrial scale ethyne is prepared by the reaction of calcium carbide (CaC_2) with water.Calcium carbide is prepared by heating lime (CaO) and coke (C) at a very high temperature in an electric furnace.

$CAO + C \text{------>} CaC_2 + CO$

$CaC_2 + 2H_2O \text{------->} Ca(OH)_2 + HC{=}CH$

Q5. Give three use of methane?

Ans 1:

- Methane is used as fuel as an illuminating gas.
- used for the preparation of methyl chloride ,methylene chloride,chloroform.
- for the preparation of carbon black used in paints ,prints printing inks and automobiles tyres.

Q6. What is heat of combustion?

Ans 1: Burning of alkane in presence of oxygen is known as combustion,Complete combustion of an alkene yield CO_2,H_2O and heat.The amount to heat evolved when one mole of a hydrocarbon is brunt to $CO_2$and H_2O is called heat of combustion.

Q7. What is Hydrogenolysis?Give an example.

Ans 1: Hydrogenolysis is a chemical reaction whereby a carbon -carbon or carbon-heteroatom single bond is cleaved or

undergoes lysis by hydrogen.The heteroatom may vary,but it usually is oxygen,nitrogen or sulfur.A related reaction is hydrogenation,where hydrogen is added to the molecule,without cleaving bonds.
R-X + H-H-----> R-H + HX

Q8. Distinguish between Ethene and Acetylene?

Ans 1: Ethene and acetylene both are un-saturated compounds. Ethene contains sigma-bond,having partially fiiled p-orbitals overlap in a parallel fashion.sigma-electron are less firmly held between the nuclie. In ethene a sigma-bond is a weak bond.

Ans 2: In actetylene,the carbon atoms are held together by a triple bond,a o-bond and two sigma-bond.The electron density between the carbon atoms is very high which draws atoms very close to each other.Electron in a triple bond are,therefore,less exposed and thus less reactive towards reagents than ethene.

Q9. Why are some hydrocarbons called saturated and other unsaturated?

Ans 1: Those compounds in which the four valencies of carbons are satisfied by single bonds to either other carbon atom or hydrogen atom are called saturated hydrocarbons,Those compounds in which the four valencies of carbon atom are not satisfied by single bonds,however satisfied by double or triple bond are called unsaturated hydrocarbons.

Q10. Describe a test for the presence of unsaturation in organic molecules.

Ans 1: When alkenes are treated with mild oxidizing reagents like dilute alkaline $KMnO_4$solution (Bayer's Reagent) at low temperature,hydroxylation of double bond occur resulting in the formation of dihydroxy compounds known as vicinal glycols. The pink colouration of $KMnO_4$solution is discharged.

$3CH_2=CH_2+ 2KMnO_4+ 4H_2O---->HO-CH_2-CH_2-OH+2MnO_2+2KOH$
