SHIKSHA CLASSES

Subject : Science -I **Answer Paper** **Marks : 20**
Class : X **9. Carbon Compounds**

Q.1: A) Choose the correct alternative : 2

1) The first compound to be prepared in the laboratory was ------

Ans: d) Urea.

2) The number of C-H bonds in ethane C_2H_6 molecule are ------

Ans: b) 6

B) Solve the following questions. (Any One) 1

1) Identify the type of reaction :

$$CH_3-CH=CH-CH_3+Br_2 \longrightarrow CH_3-CHBr-CHBr-CH_3$$

Ans: Addition reaction

2) Write the structural formula for : 1 – bromopropane.

Ans: $CH_3-CH_2-CH_2-Br$

3) Find the odd one out : Polysaccharide, Teflon, Polyvinylchloride, PET.

Ans: PET (other are homopolymers)

Q.2: A) Give scientific reason. (Any One) 2

1) Iodine test is used for detection of a multiple bond in a carbon compound.

Ans: When a carbon compound combines with another compound to form a product that contain all the atoms in both the reactants it is called an addition reaction.
The addition reaction of an unsaturated compound with iodine takes place instantanously at room temperature. The colour change can be felt by eyes. Therefore iodine test is used as a test for detection of a multiple bond in a carbon compound.

2) In hydrogenation of vegetable oil nickel catalyst is used.

Ans: The unsaturated compound can undergo addition reaction with hydrogen to form saturate compound. In presence of nickel catalyst.
The moecules of vegetable oil contain long and unsaturated carbon chains. Hydrogenation transforms then into saturated chains and thereby vanaspatighee is formed.

B) Solve the following question (Any Two) 4

1) What cause the existence of very large number of carbon compound?

Ans: Carbon has a unique ability to form strong covalent bonds with other carbon atoms to form big molecules causes the existence of very large number of carbon compounds.

2) Define structural isomerism.

Ans: The phenomenon in which compounds having different structural formulae have the same molecular formula is called structural isomerism.

The number of carbon compounds increases due to isomerism.

3) Saturated hydrocarbons are classified into three types. Write these names by giving one example each.

Ans: Saturated hydrocarbons are classified into 3 types as :

i) Straight chain hydrocarbon : Butane $-CH_3 - CH_2 - CH_2 - CH_3$

ii) Branched chain hydrocarbon : 2 methyl propane

$$CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$$

iii) Rings of hydrocarbon : Cyclobutane

$$\begin{array}{l} CH_3 - CH_2 \\ | \quad\quad | \\ CH_2 - CH_2 \end{array}$$

4) Draw the structural formula for the followig IUPAC name.

(i) 2 bromo-butene (ii) Butanoic acid

Ans: i) $CH_3 - \underset{\displaystyle Br}{\underset{|}{C}} = CH - CH_3$ ii) $CH_3 - CH_2 = CH_2 - COOH$

Q.3: Answer the following questions (Any Two) 6

1) Write the difference between saturated hydrocarbon and unsaturated hydrocarbon.

Ans:

Saturated hydrocarbon	Unsaturated hydrocarbon
1) They contain only single bond between two carbon atoms (C–C)	1) They contain double or triple bond between two carbon atom (C–C) or $(C \equiv C)$
2) They are chemically less reactive	2) They are chemically more reactive.
3) The general formulae C_nH_{2n+2}	3) The general formula is C_nH_{2n-2}
4) Substitution reaction is characteristic property of saturated hydrocarbon	4) Addition reaction is characteristic property of unsaturated compound
5) Saturated hydrocarbons burns with clean blue flame	5) Unsaturated compounds burns with yellow flame
6) Example - Methane Ethyne $H - C \equiv C - H$	6) Example - Ethane $- CH_2 = CH_2$

2) What is combustion of carbon compounds? Explain with example.

Ans: The burning of carbon compounds in presence of oxygen to emit heat & light to form carbon dioxide & water is called combustion of carbon compounds.

For eg: methane burns to give carbon dioxide & water

$$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O + \text{heat} + \text{light}$$

3) What is meant by vinegar and gasohol? What are their uses?

Ans: Vinegar is a sour tasting liquid. It is 5-8% aqueous solution of acetic acid.

1) Vinegar contains acetic acid, water and other trace chemical.
2) Vinegar is made through the formation of ethanol by acetic acid bacteria.

Uses of vinegar :

i) Used as a cooking ingredient.
ii) Used as a preservative in pickles.

Gasohol :

It is a mixture of gasoline and ethyl alcohol. It is a mixture of nine parts of unleaded gasoline by volume with one part of ethanol ethylalcohol.

Uses of gasohol :

i) Gasohol is used as an additive to increase the efficiency of petrol.

ii) A mixture of 80% to 90% petrol with 20% or 10% ethyl alcohol used as a fuel in internal combustion engines.

iii) Used as a fuel in motor.

iv) In motor fuel contains 90% gasoline and 10% ethanol.

4) Write the IUPAC names of the following structural formulae.

Ans: i) $CH_3 - \underset{\displaystyle Br}{\underset{|}{CH}} - CH_3$ **- 2-Bromopropane**

ii) $CH_3 - CO - CH_2 - CH_3$ **- 2 Butanone**

iii) $CH_3 - CH_2 - CH_2 - CH_2 - OH$ **- Butane-1-ol**

Q.4: Solve the following questions. (Any One) 5

1) Explain chemical properties of ethanoic acid.

Ans: i) Reaction with Base :

a) Reaction with strong base : Ethanoic acid gives neutralization reaction with a strong base sodium hydroxide to form a salt & water.

$$CH_3 - COOH + NaOH \longrightarrow CH_3 - COONa + H_2O$$

(Acid) (Base) (Salt) (Water)

The IUPAC name of the salt formed is Sodium ethanoate while its common name is sodium acetate.

b) Reaction with carbonate and bicarbonate :

When ethanoic acid reacts with sodium carbonate to form salt named sodium ethanoate water and carbon dioxide gas

$$2CH_3COOH_{(aq)} + Na_2CO_{3(g)} \longrightarrow CH_3COONa_{(aq)} + H_2O(l) + CO_{2(g)}$$

When the sodium bicarbonate is used then similar observation are obtained.

$$CH_3COOH + NaHCO_3 \longrightarrow CH_3COONa + H_2O + CO_2$$

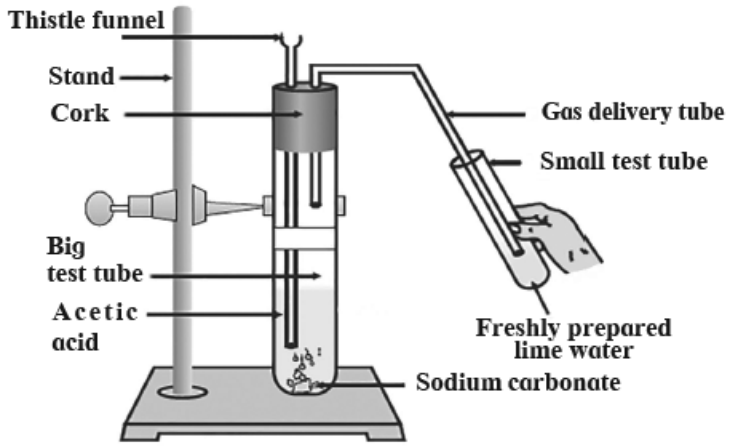
ii) Esterification Reaction : Substances having ester as the functional group are formed by reaction between a carboxylic acid and an alcohol.

Ethanoic acid reacts with ethanol in presence of an acid catalyst and ester. ethyl ethhanoate is formed.

$$CH_3 - COOH + CH_3 - CH_2 - OH \xrightarrow[\text{Catolyst}]{\text{Acid}} CH_3 - COO - CH_2 - CH_3 + H_2O$$

(Ethanoic acid) (Ethanol) (Ethyl Ethanoate) (Water)

2) With referene to given diagram answer the following question.



i) Which gas does come out as effervescence in the big test tube?

Ans: CO_2 gas come out as effervescence in the bit test tube.

ii) Which reaction shown in the given diagram?

Ans: The given diagram shows the reaction of acetic acid and sodium carbonate.

iii) Why are bubbles seen in the small test tube?

Ans: CO_2 gas liberated from the reaction of acetic acid and sodium carbonate is delivered in small tube. So we see bubbles of CO_2 gas in small test tube.

iv) What is the colour change in the lime water? Write the related equation.

Ans: On passing CO_2 gas lime water turns milky $Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$

Due to formation of insoluble ppt of calcium carbonate lime water turns milky.

v) Write the balanced chemical reaction of acetic acid and sodium carbonate.

Ans: Ethanoic acid react with sodium carbonate to form a salt named sodium ethanoate water and carbon dioxide gas is liberated

$$2CH_3 - COOH + Na_2CO_3 \longrightarrow CH_3COONa + H_2O + CO_2 \uparrow$$

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