

Chapter 4: Carbon and Its Compounds

NCERT Exemplar · Class 10 · Science

Multiple Choice Questions

Question 1

Carbon exists in the atmosphere in the form of

A.

carbon monoxide only

B.

carbon monoxide in traces and carbon dioxide

C.

carbon dioxide only

D.

coal

Answer

Correct option: C

Solution

The answer is (c) carbon dioxide only

Question 2

Which of the following statements are usually correct for carbon compounds? These

(a) (i) and (iii)

(b) (ii) and (iii)

(c) (i) and (iv)

(d) (ii) and (iv)

A.

are good conductors of electricity

B.

are poor conductors of electricity

C.

have strong forces of attraction between their molecules

D.

do not have strong forces of attraction between their molecules

Solution

The answer is (d) (ii) and (iv)

Explanation:

Carbon compounds form covalent bonds hence they have very weak force of attraction. Carbon compounds are poor conductors of electricity.

Question 3

A molecule of ammonia (NH_3) has

A.

only single bonds

B.

only double bonds

C.

only triple bonds

D.

two double bonds and one single bond

Answer

Correct option: A

Solution

The answer is (a) only single bonds

Explanation:

Nitrogen has three electrons in its outermost shell and hydrogen has 1. 3 hydrogen atoms combine with 1 nitrogen atom to make ammonia. These bonds are single bonds.

Question 4

Buckminsterfullerene is an allotropic form of

A.

phosphorus

B.

sulphur

C.

carbon

D.

tin

Answer

Correct option: C

Solution

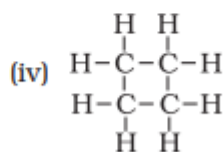
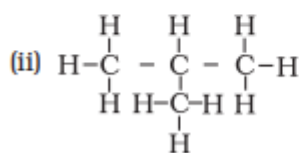
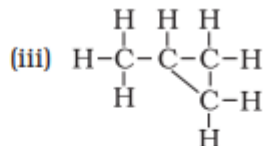
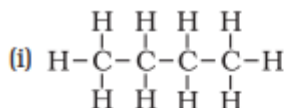
The answer is (c) carbon

Explanation:

Diamond, Graphite, Lonsdaleite, C₆₀ (Buckminsterfullerene or buckyball), C₅₄₀, C₇₀, Amorphous carbon, and a single-walled carbon nanotube, or buckytube. Are the allotropes of Carbon.

Question 5

Which of the following are correct structural isomers of butane?



A.

(i) and (iii)

B.

(ii) and (iv)

C.

(i) and (ii)

D.

(iii) and (iv)

Answer

Correct option: C

Solution

The answer is (c) (i) and (ii)

Explanation:

Chemical formula of Butane is C_4H_{10} , here option iii) and iv) have 8 hydrogen atoms, hence they are wrong.

Question 6



In the above-given reaction, alkaline $KMnO_4$ acts as

A.

reducing agent

B.

oxidising agent

C.

catalyst

D.

dehydrating agent

Answer

Correct option: B

Solution

The answer is (b) oxidising agent

Explanation:

Two Hydrogen atoms are replaced by an atom of oxygen making oxidation of ethanol. Here addition of oxygen is provided by potassium.

Question 7

Oils on treating with hydrogen in the presence of palladium or nickel catalyst form fats. This is an example of

A.

Addition reaction

B.

Substitution reaction

C.

Displacement reaction

D.

Oxidation reaction

Answer

Correct option: A

Solution

The answer is (a) Addition reaction

Explanation:

Here Hydrogen is added to oil, hence it is an addition reaction.

Question 8

In which of the following compounds, — OH is the functional group?

A.

Butanone

B.

Butanol

C.

Butanoic acid

D.

Butanal

Answer

Correct option: B

Solution

The answer is (b) Butanol

Explanation:

Compound with OH Functional group will have a suffix ol in them hence answer is (b) Butanol.

Question 9

The soap molecule has a

A.

hydrophilic head and a hydrophobic tail

B.

hydrophobic head and a hydrophilic tail

C.

hydrophobic head and a hydrophobic tail

D.

hydrophilic head and a hydrophilic tail

Answer

Correct option: A

Solution

Answer is (a) hydrophilic head and a hydrophobic tail

Explanation:

Because of hydrophobic tail Oil and grease is trapped inside a micelle. Hydrophobic head makes the outer surface of micelle. Hence micelle is easily washed by water.

Question 10

Which of the following is the correct representation of the electron dot structure of nitrogen?

- (a) $\cdot\ddot{\text{N}} : \ddot{\text{N}}\cdot$
(b) $\cdot\dot{\text{N}} :: \dot{\text{N}}\cdot$
(c) $\cdot\ddot{\text{N}} : \dot{\text{N}}\cdot$
(d) $\cdot\text{N} :: \text{N}\cdot$

Solution

The answer is d)

Explanation:

In this structure Nitrogen atoms get 8 electrons whereas in other options it is different.

Question 11

Structural formula of ethyne is

- (a) $\text{H} - \text{C} \equiv \text{C} - \text{H}$
(b) $\text{H}_3 - \text{C} \equiv \text{C} - \text{H}$
(c) $\begin{array}{c} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C} = \text{C} \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array}$
(d) $\begin{array}{c} \text{H} & & \text{H} \\ & \diagdown & / \\ \text{H} - & \text{C} - & \text{C} - \text{H} \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array}$

Solution

The answer is a)

Explanation:

Chemical formula of Ethyne is C_2H_2 , Hence answer is a)

Question 12

Identify the unsaturated compounds from the following

- (a) (i) and (ii)

(b) (ii) and (iv)

(c) (iii) and (iv)

(d) (ii) and (iii)

A.

Propane

B.

Propene

C.

Propyne

D.

Chloropropane

Solution

The answer is (d) (ii) and (iii)

Explanation:

Propene has double bond and Propyne is having a triple bond. Hence they are unsaturated compounds.

Question 13

Chlorine reacts with saturated hydrocarbons at room temperature in the

A.

absence of sunlight

B.

presence of sunlight

C.

presence of water

D.

presence of hydrochloric acid

Answer

Correct option: B

Solution

The answer is (b) presence of sunlight

Explanation:

In the presence of sunlight, Chlorine reacts with Hydrocarbons and displaces Hydrogen atoms.

Question 14

In the soap micelles

A.

the ionic end of soap is on the surface of the cluster while the carbon chain is in the interior of the cluster.

B.

ionic end of soap is in the interior of the cluster and the carbon chain is out of the cluster.

C.

both ionic end and carbon chain are in the interior of the cluster

D.

both ionic end and carbon chain are on the exterior of the cluster

Answer

Correct option: A

Solution

The answer is (a) the ionic end of soap is on the surface of the cluster while the carbon chain is in the interior of the cluster.

Explanation:

A micelle is a spherical aggregate soap molecules in soap solution. In the soap micelles, the ionic end of soap is on the surface of the cluster while the carbon chain is in the interior of the cluster.

Question 15

Pentane has the molecular formula C_5H_{12} . It has

A.

5 covalent bonds

B.

12 covalent bonds

C.

16 covalent bonds

D.

17 covalent bonds

Answer

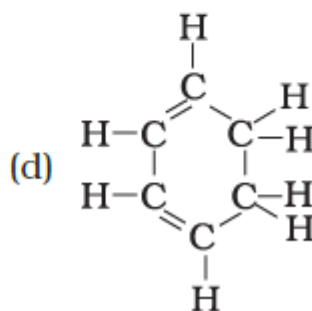
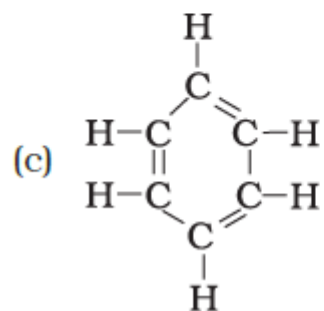
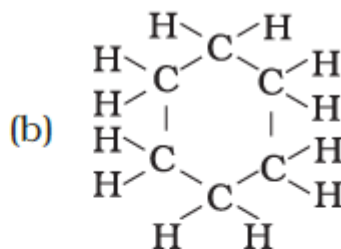
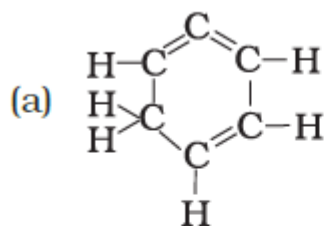
Correct option: C

Solution

The answer is (c) 16 covalent bonds

Question 16

Structural formula of benzene is



Solution

The answer is c)

Explanation:

Chemical formula of Benzene is C_6H_6 . In option c) the arms of carbon atoms are occupied hence it is the right answer.

Question 17

Ethanol reacts with sodium and forms two products. These are

A.

sodium ethanoate and hydrogen

B.

sodium ethanoate and oxygen

C.

sodium ethoxide and hydrogen

D.

sodium ethoxide and oxygen**Answer**

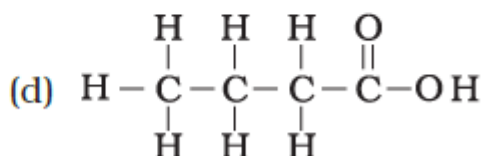
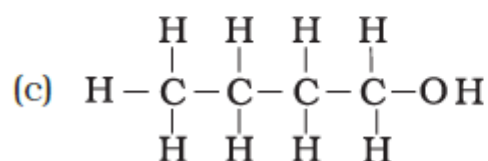
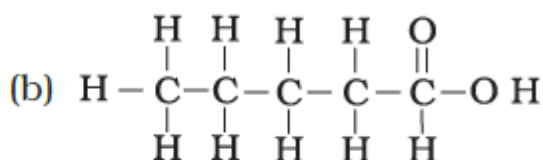
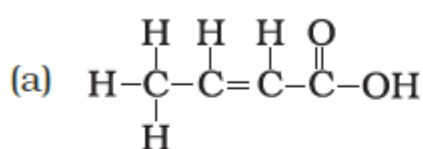
Correct option: C

Solution

The answer is (c) sodium ethoxide and hydrogen

Explanation:**Question 18**

The correct structural formula of butanoic acid is

**Solution**

The answer is d)

Question 19

Vinegar is a solution of

- (a) 50% – 60% acetic acid in alcohol
- (b) 5% – 8% acetic acid in alcohol
- (c) 5% – 8% acetic acid in water
- (d) 50% – 60% acetic acid in water

Solution

The answer is (c) 5% – 8% acetic acid in water

Question 20

Mineral acids are stronger acids than carboxylic acids because

- (i) mineral acids are completely ionised
- (ii) carboxylic acids are completely ionised
- (iii) mineral acids are partially ionised
- (iv) carboxylic acids are partially ionised
- (a) (i) and (iv)
- (b) (ii) and (iii)
- (c) (i) and (ii)
- (d) (iii) and (iv)

Solution

The answer is (a) (i) and (iv)

Explanation:

Mineral acids are completely ionized whereas carboxylic acids are partially ionized. Hence mineral acids are stronger than carboxylic acids.

Question 21

Carbon forms four covalent bonds by sharing its four valence electrons with four univalent atoms, e.g. hydrogen. After the formation of four bonds, carbon attains the electronic configuration of

- (a) helium
- (b) neon
- (c) argon
- (d) krypton

Solution

The answer is (b) neon

Explanation:

After sharing four valence electrons with univalent atoms. Electronic configuration of Carbon becomes 2.8 which is same as the electronic configuration of Neon.

Question 22

The correct electron dot structure of a water molecule is

- (a) $\text{H} \cdot \ddot{\text{O}} \cdot \text{H}$
- (b) $\text{H} : \ddot{\text{O}} : \text{H}$
- (c) $\text{H} : \ddot{\text{O}} : \text{H}$
- (d) $\text{H} : \text{O} : \text{H}$

Solution

Answer is c)

Explanation:

Option c) represents a complete octet configuration. Hence it is the right answer.

Question 23

Which of the following is not a straight-chain hydrocarbon?

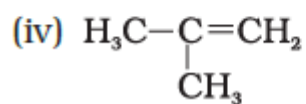
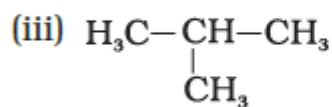
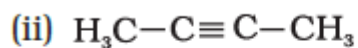
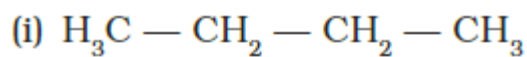
- (a) $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\underset{\text{CH}_3}{\text{CH}_2}$
- (b) $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$
- (c) $\underset{\text{CH}_3}{\text{H}_2\text{C}}-\text{H}_2\text{C}-\text{H}_2\text{C}-\underset{\text{CH}_3}{\text{CH}_2}$
- (d) $\begin{matrix} \text{CH}_3 \\ \text{H}_3\text{C} \end{matrix} > \text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3$

Solution

The answer is d)

Question 24

Which among the following are unsaturated hydrocarbons?



A.

(i) and (iii)

B.

(ii) and (iii)

C.

(ii) and (iv)

D.

(iii) and (iv)

Answer

Correct option: C

Solution

The answer is (c) (ii) and (iv)

Explanation:

Option (ii and (iv) having double and triple bonds, hence they are unsaturated hydrocarbons.

Question 25

Which of the following does not belong to the same homologous series?

A.



B.



C.



D.



Answer

Correct option: D

Solution

The answer is (d) C_4H_8

Explanation

General formula for C_4H_8 is C_nH_{2n} and for other option it is $\text{C}_n\text{H}_{2n+2}$

Question 26

The name of the compound $\text{CH}_3 - \text{CH}_2 - \text{CHO}$ is

(a) Propanal

(b) Propanone

(c) Ethanol

(d) Ethanal**Solution**

The answer is (a) Propanal

Explanation:

This compound has 3 carbon atoms and an aldehyde which add suffix al to 3 carbon compound.

Question 27

The heteroatoms present in $\text{CH}_3 - \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 \text{Cl}$ are

- (i) oxygen
- (ii) carbon
- (iii) hydrogen
- (iv) chlorine
- a) (i) and (ii)
- (b) (ii) and (iii)
- (c) (iii) and (iv)
- (d) (i) and (iv)

Solution

The answer is (d) (i) and (iv)

Explanation:

Oxygen and chlorine are not among essential components of Hydrocarbon hence they are heteroatoms.

Question 28

Which of the following represents the saponification reaction?

A.



B.



C.



D.



Answer

Correct option: D

Solution

The answer is (d) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$

Explanation:

Saponification is a reaction in which ethanol and sodium ethanoate are produced upon treatment of ester with an alkali.

Question 29

The first member of the alkyne homologous series is

- (a) ethyne
- (b) ethene
- (c) propyne
- (d) methane

Solution

The answer is (a) ethyne

Short Answer Questions

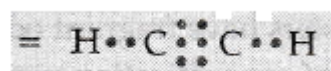
Question 30

Draw the electron dot structure of ethyne and also draw its structural formula

Solution

Molecular formula= C_2H_2

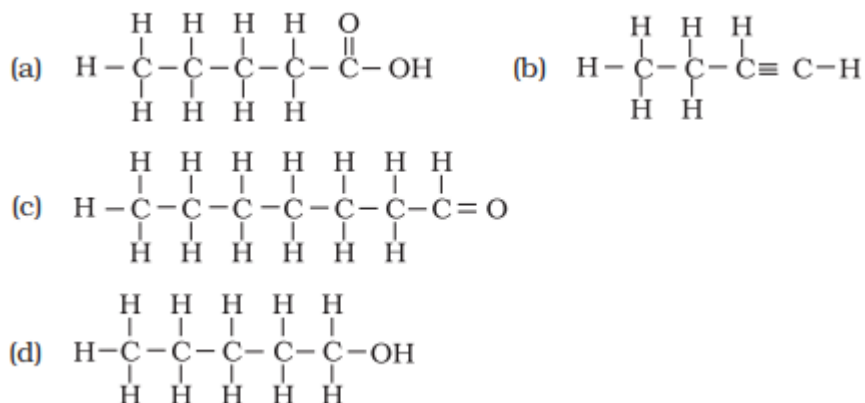
Electronic Formula



Structural formula= $H-C \equiv C-H$

Question 31

Write the names of the following compounds

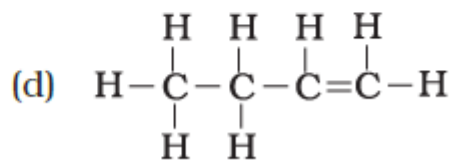
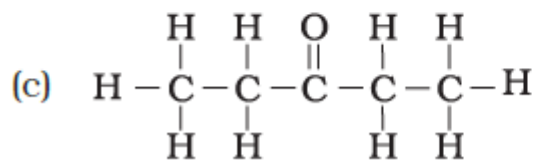
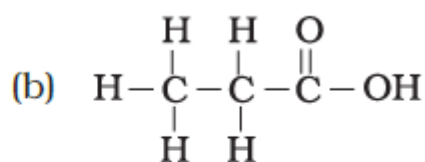
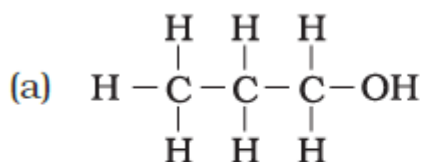


Solution

1. Pentanoic acid
2. Butyne
3. Heptanal
4. Pentanol

Question 32

Identify and name the functional groups present in the following compounds.



Solution

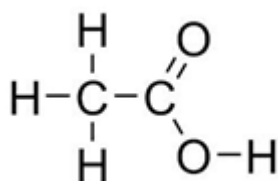
1. Alcohol
2. Carboxylic acid
3. Ketone
4. Alkene

Question 33

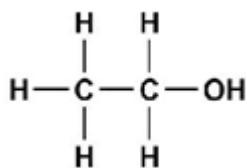
A compound X is formed by the reaction of a carboxylic acid $\text{C}_2\text{H}_4\text{O}_2$ and an alcohol in the presence of a few drops of H_2SO_4 . The alcohol on oxidation with alkaline KMnO_4 followed by acidification gives the same carboxylic acid as used in this reaction. Give the names and structures of (a) carboxylic acid, (b) alcohol and (c) the compound X. Also write the reaction.

Solution

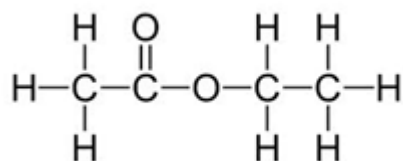
Carboxylic acid = CH_3COOH ethanoic acid



Alcohol = $\text{CH}_3\text{CH}_2\text{OH}$ ethanol



X = $\text{CH}_3\text{COOCH}_2\text{CH}_3$ ethyl ethanoate



Question 34

Why detergents are better cleansing agents than soaps? Explain.

Solution

Detergents are better than soaps because detergents are ammonium or sulphonate salts of long-chain carboxylic acids. Charged ends of these will not form precipitate with calcium and magnesium present in hard water. On the other hand, soaps will form a precipitate with calcium and magnesium ions present in the hard water.

Question 35

Name the functional groups present in the following compounds

(a) $\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

(b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

(c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$

(d) $\text{CH}_3\text{CH}_2\text{OH}$

Solution

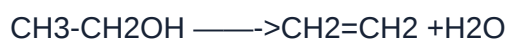
1. Ketone
2. Carboxylic acid
3. Aldehyde
4. Alcohol

Question 36

How is ethene prepared from ethanol? Give the reaction involved in it.

Solution

Ethanol is heated at 443K along with excess Sulphuric acid to obtain Ethene.



(ethanol) (H₂SO₄) (ethene)

Question 37

Intake of a small quantity of methanol can be lethal. Comment.

Solution

Methanol gets converted to Methanal and liver and kills all the cells. Methanol also affects the optic nerves and causes blindness. Hence intake of a small quantity of methanol can be lethal.

Question 38

A gas is evolved when ethanol reacts with sodium. Name the gas evolved and also write the balanced chemical equation of the reaction involved.

Solution

When ethanol reacts with sodium it gives Sodium ethoxide with the liberation of hydrogen gas.

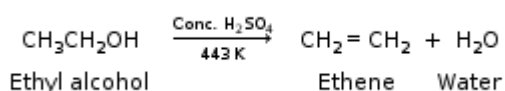


Question 39

Ethene is formed when ethanol at 443 K is heated with excess of concentrated sulphuric acid. What is the role of sulphuric acid in this reaction? Write the balanced chemical equation of this reaction.

Solution

Sulphuric acid acts as a catalyst and a dehydrating agent in the formation of ethene.



Question 40

Carbon, Group (14) element in the Periodic Table, is known to form compounds with many elements. Write an example of a compound formed with

(a) chlorine (Group 17 of Periodic Table)

(b) oxygen (Group 16 of Periodic Table)

Solution

a) CCl_4 – Carbon Tetrachloride

b) Carbon-di-oxide- CO_2

Question 41

In electron dot structure, the valence shell electrons are represented by crosses or dots.

(a) The atomic number of chlorine is 17. Write its electronic configuration

(b) Draw the electron dot structure of chlorine molecule

Solution

1. KLM- 2,8,7

**Question 42**

Catenation is the ability of an atom to form bonds with other atoms of the same element. It is exhibited by both carbon and silicon. Compare the ability of catenation of the two elements. Give reasons.

Solution

Catenation is shown by both Silicon and Carbon. Silicon bonds are less stable and reactive whereas bonds formed by Carbon bonds are very strong hence carbon shows better catenation than Silicon.

Question 43

Unsaturated hydrocarbons contain multiple bonds between the two C-atoms and show addition reactions. Give the test to distinguish ethane from ethene.

Solution

Saturated Hydrocarbons burns with a clean flame and produce no soot whereas non-saturated Hydrocarbons burns with a yellow flame and produces a lot of soot. Ethane is saturated hydrocarbon and it burns with clean flame with no soot. Ethene is unsaturated hence it burns with yellow flame producing a lot of soot.

Question 44

Match the reactions given in Column (A) with the names given in column (B).

Column A	Column B
(a) $\text{CH}_3\text{OH} + \text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COOCH}_3 + \text{H}_2\text{O}$	(i) Addition reaction
(b) $\text{CH}_2 = \text{CH}_2 + \text{H}_2 \rightarrow \text{CH}_3 - \text{CH}_3$	(ii) Substitution reaction
(c) $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$	(iii) Neutralisation reaction
(d) $\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O}$	(iv) Esterification reaction

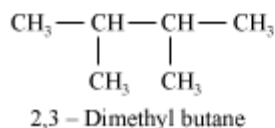
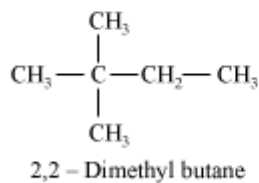
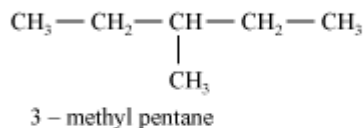
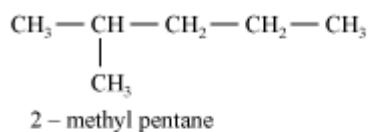
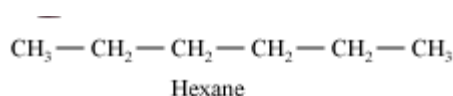
Solution

Column A	Column B
(a) $\text{CH}_3\text{OH} + \text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COOCH}_3 + \text{H}_2\text{O}$	(iv) Esterification reaction
(b) $\text{CH}_2 = \text{CH}_2 + \text{H}_2 \rightarrow \text{CH}_3 - \text{CH}_3$	(i) Addition reaction
(c) $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$	(ii) Substitution reaction
(d) $\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O}$	(iii) Neutralisation reaction

Question 45

Write the structural formulae of all the isomers of hexane.

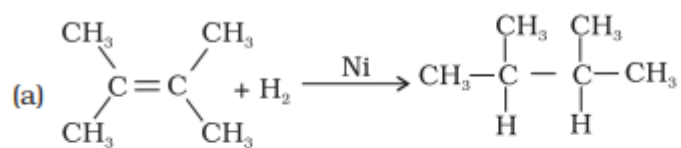
Solution



Question 46

What is the role of metal or reagents written on arrows in the given chemical reactions?

Solution

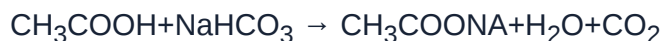


Question 47

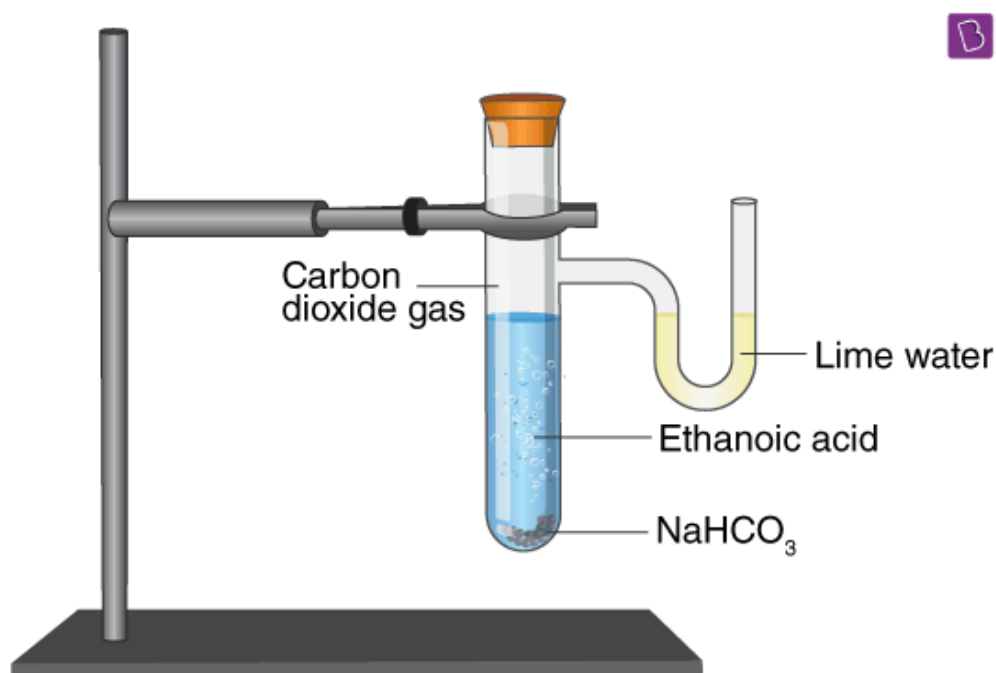
A salt X is formed and a gas is evolved when ethanoic acid reacts with sodium hydrogen carbonate. Name the salt X and the gas evolved. Describe an activity and draw the diagram of the apparatus to prove that the evolved gas is the one which you have named. Also, write a chemical equation of the reaction involved.

Solution

When ethanoic acid reacts with Sodium Hydrogen Carbonate with production of Sodium Ethanoate and producing Carbon-di-oxide gas.



Here salt X is Sodium Ethanoate and gas evolved is Carbon-di-oxide.



Activity

- Set up the experiment as shown in figure.
- Take a spoon full of Sodium Hydrogen Carbonate in a test-tube and add 2ml of dilute ethanoic acid.
- Brisk effervescence occur in testtube.
- Pass the produced gas into lime water
- Lime water turns milky confirming the evolution of CO_2

Question 48

(a) What are hydrocarbons? Give examples.

(b) Give the structural differences between saturated and unsaturated hydrocarbons with two examples each. (c) What is a functional group? Give examples of four different functional groups.

Solution

1. Compounds of Carbon and hydrogen are called as Hydrocarbons. Ex: Ethane, Methane
2. All the bond in saturated Hydrocarbons are single bonds whereas bonds in the unsaturated Hydrocarbons are either double or triple bonds.

Saturated Hydrocarbon Ex: Ethane, Methane

Unsaturated Hydrocarbons-Ethyne, Ethene

1. Functional groups are a set of atoms joined in a specific manner which is responsible for the characteristic chemical property of the compound. Ex: CHO-Aldehyde, OH-Hydroxyl, COOH-Carboxylic acid.

Question 49

Name the reaction which is commonly used in the conversion of vegetable oils to fats. Explain the reaction involved in detail.

Solution

Addition reaction is involved in the conversion of oils into fats. This process is known as Hydrogenation. Here Unsaturated vegetable are converted to saturated fats which have saturated carbons.

Nickel is used as a catalyst in the hydrogenation process and the reaction is given below

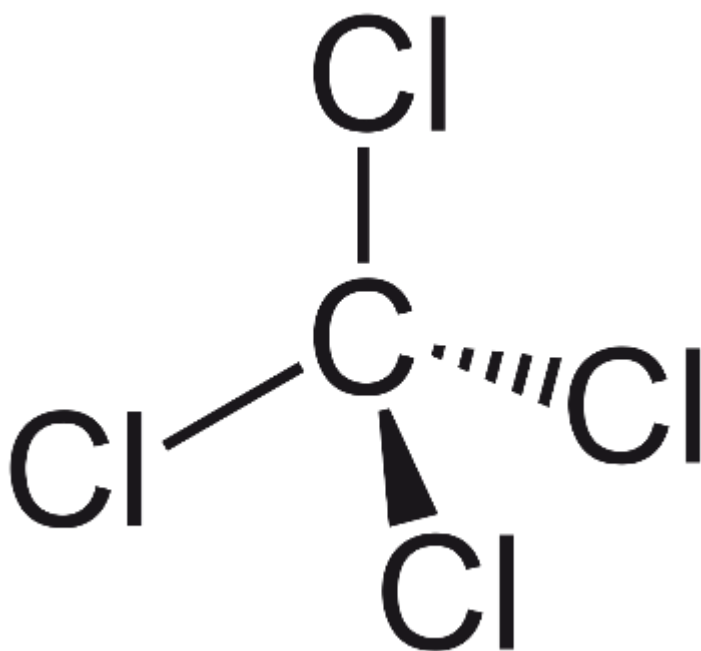


Question 50

- (a) Write the formula and draw the electron dot structure of carbon tetrachloride.
- (b) What is saponification? Write the reaction involved in this process.

Solution

1. Carbon tetrachloride- CCl_4



1. The reaction of an ester in the presence of base to give sodium salt of carboxylic acid and alcohol is known as saponification and it is used in the preparation of soap.

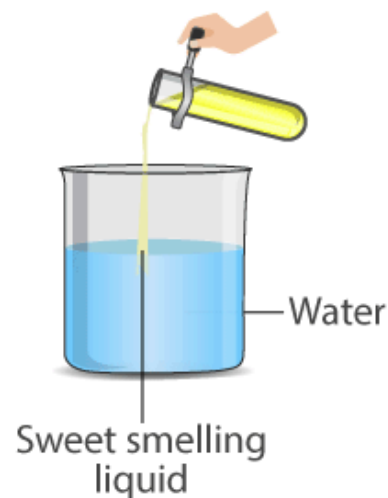
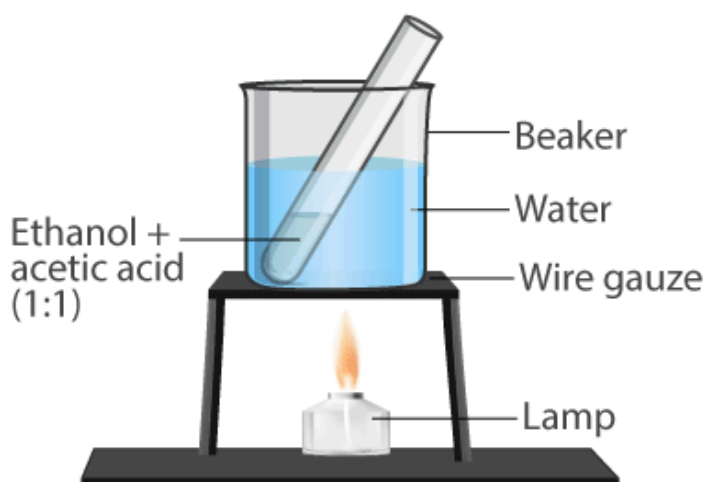


Question 51

Esters are sweet-smelling substances and are used in making perfumes. Suggest some activity and the reaction involved in the preparation of an ester with well-labelled diagram.

Solution

In a test-tube take 1ml ethanol and 1 ml glacial acetic acid and add few drops of concentrated H_2SO_4 . Warm the test tube for 5 minutes over a water bath. Transfer the content in a beaker. Sweet smell confirms the formation of Ester.



O

(Ester)

Question 52

A compound C (molecular formula, $\text{C}_2\text{H}_4\text{O}_2$) reacts with Na – metal to form a compound R and evolves a gas which burns with a pop sound. Compound C on treatment with an alcohol A in presence of an acid forms a sweet-smelling compound S (molecular formula, $\text{C}_3\text{H}_6\text{O}_2$). On addition of NaOH to C, it also gives R and water. S on treatment with NaOH solution gives back R and A. Identify C, R, A, S and write down the reactions involved.

Solution

Solution coming soon.

so compound S is Ester or Ethyl ethanoate and compound A is Ethanol

Question 53

Look at Figure 4.1 and answer the following questions

(a) What change would you observe in the calcium hydroxide solution taken in tube B?

(b) Write the reaction involved in test tubes A and B respectively.

(c) If ethanol is given instead of ethanoic acid, would you expect the same change?

(d) How can a solution of lime water be prepared in the laboratory?

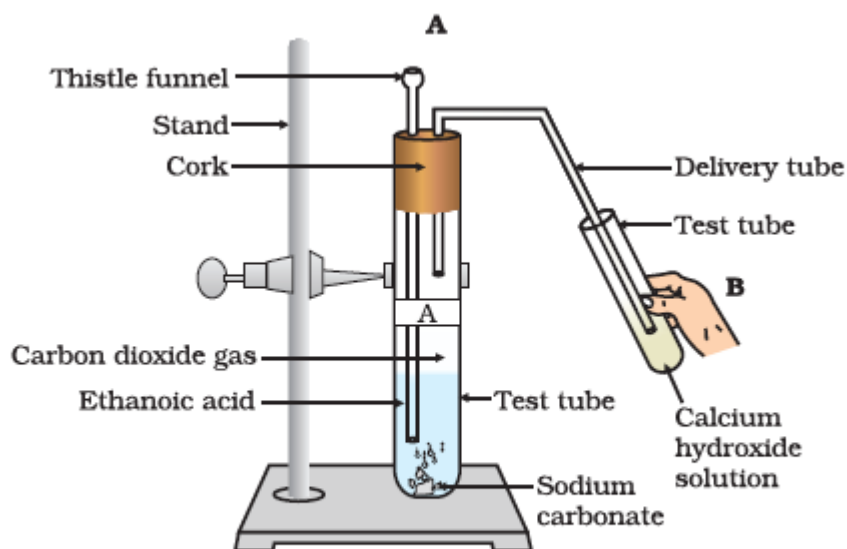
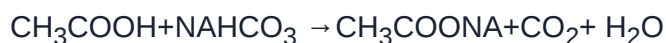


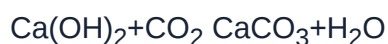
Fig. 4.1

Solution

1. Calcium Hydroxide solution would become milky
2. Reaction in Tube A



Reaction in tube B



1. Ethanol will not react with Sodium Hydrogen carbonate. Hence same change will not be observed.
2. In a beaker take distilled water and mix Calcium carbonate powder and mix thoroughly. Allow the solution to settle and decant the clear solution to obtain the lime water.

Question 54

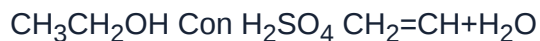
How would you bring about the following conversions? Name the process and write the reaction involved.

(a) ethanol to ethene.

b) propanol to propanoic acid. Write the reactions.

Solution

1. Ethene is formed when ethanol is heated at 443 K with an excess of concentrated sulphuric acid.

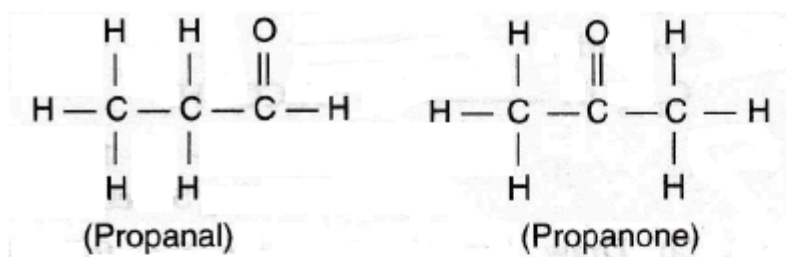


1. Propanol is treated with alkaline Potassium permanganate or acidified Potassium-di-chromate to obtain propanoic acid.

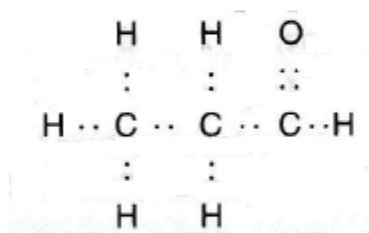


Question 55

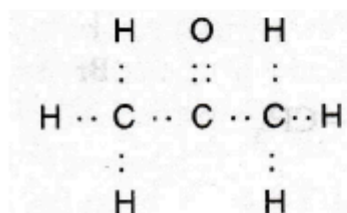
Draw the possible isomers of the compound with molecular formula $\text{C}_3\text{H}_6\text{O}$ and also give their electron dot structures.

Solution

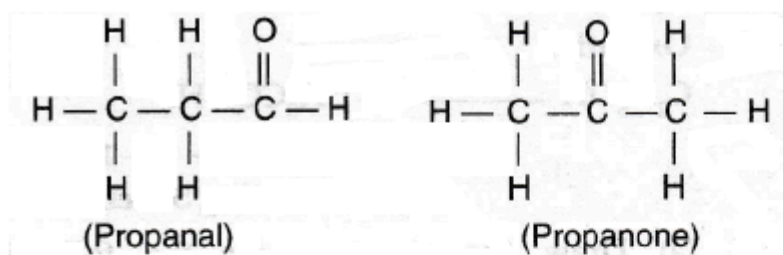
(ii) Electron dot structure of propanal.



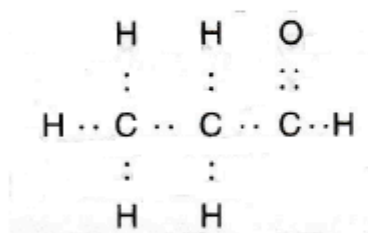
Electron dot structure of propanone



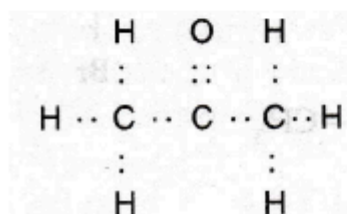
(i) The two possible isomers of the compound with molecular formula C_3H_6O are :



(ii) Electron dot structure of propanal.



Electron dot structure of propanone



Question 56

Explain the given reactions with the examples

(a) Hydrogenation reaction

(b) Oxidation reaction

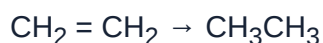
(c) Substitution reaction

(d) Saponification reaction

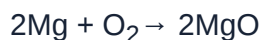
(e) Combustion reaction

Solution

(a) Hydrogenation reaction can be defined as an addition reaction between the hydrogen and other compounds in the presence of a catalyst.



(b) An oxidation reaction is a reaction in which oxygen combines with an element or a compound. In other words, it can also be defined as a molecule loses its electrons.



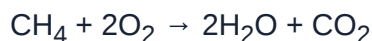
(c) Substitution reaction can be defined as the reaction in which a more reactive element displaces a less reactive element from its aqueous salt solution.



(d) Saponification reaction is the reaction in which the hydrolysis of an ester takes place with NaOH or KOH to give alcohol and sodium or potassium salt of the acid.



(e) Combustion reaction is the reaction in which oxygen combines with a compound to form carbon dioxide and water. These reactions are exothermic, meaning they give off heat.

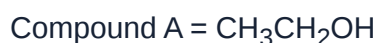


Question 57

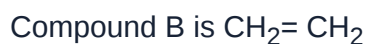
An organic compound A on heating with concentrated H_2SO_4 forms a compound B which on addition of one mole of hydrogen in presence of Ni forms a compound C. One mole of compound C on combustion forms two moles of CO_2 and 3 moles of H_2O . Identify the compounds A, B and C and write the chemical equations of the reactions involved.

Solution

Compound A is Ethanol



Compound B is Ethene



Compound C = $\text{CH}_3 - \text{CH}_3$

