


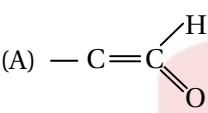
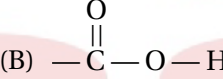
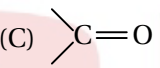


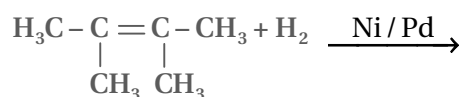
Section A

- Write the answer of the following questions. [Each carries 1 Mark] [21]
- Hard water has salts of and
 - The compounds with identical molecular formula but different structures are called
 - Acetic acid is also known as
 - Burning a copper wire in the flame of a gas stove gives a flame of colour.
 - made urea from Ammonium cyanate.
 - Molecular formula of cyclo Hexane is C_6H_6 .
 - Esters are compounds having foul smells.
 - The graphite allotrope of carbon is smooth and sticky.
 - Unsaturated hydrocarbon like propyne which burns with yellow flame and sooty smoke.
 - The process which gives hydrocarbon unsaturated from alcohol is called dehydration reaction.
 - The general formula of aldehyde is $C_nH_{2n+1}-CHO$. What will be the value of n for its first member ?
(A) 1 (B) 0 (C) 0.5 (D) 1.1
 - Which of the following is correct electron structure of water molecule ?
(A)  (B)  (C)  (D) $H-\ddot{O}-H$
 - Which catalyst is useful in hydrogenation of vegetable oil ?
(A) Pd or Ni (B) Reni (C) Pt & Pd (D) Sunlight
 - What is used in medicine Tincture of Iodine ?
(A) Ethanol (B) Ethanoic acid (C) Sodium acetate (D) Sodium hydroxide
 - Which is a functional group known as aldehyde ?
(A)  (B)  (C)  (D) $-C-OH$
 - Complete following chemical reactions : $CH_3CH_2OH + O_2$
 - A compound is useful as a fuel and its molecular formula is C_2H_6O . Give its name and molecular formula.
 - A student sharpened both the ends of pencil and connects both the ends with two poles of battery. Then does electric current pass from this circuit or not ? Give reasons for your answer.
 - What happens when a small piece of metal sodium is dipped into ethanol ?
 - Define the following : Substitution Reaction
 - Define the following : Functional Group

Section B

- Write the answer of the following questions. [Each carries 2 Marks] [22]
- What is hydrogenation? What is its industrial application ?
 - Give a test that can be used to differentiate between saturated and unsaturated hydrocarbons.

24. Explain the nature of the covalent bond using the bond formation in CH_3Cl .
25. What is an homologous series ? Explain with an example.
26. How many structural isomers can you draw for pentane ?
27. Discuss physical properties of Ethanol.
28. Complete the following reaction and mention the product.



29. What is soap chemically ? Give its solubility.
30. Give reason : Covalent compounds are non-conductor of electricity.
31. Explain the activity showing formation of Ester.

Column-I (Structural formula)	Column-II (Name of the compound)
(a) $\begin{array}{ccccccc} & \text{H} & \text{H} & \text{H} & & & \\ & & & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{OH} \\ & & & & & \\ & \text{H} & \text{Cl} & \text{H} & \text{O} & \end{array}$	(i) Cyclo Hexane
(b) $\begin{array}{ccccccc} & \text{H} & \text{H} & & \text{H} & & \\ & & & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{H} \\ & & & & & \\ & \text{H} & \text{H} & \text{O} & \text{H} & \end{array}$	(ii) Propanol
(c) $\begin{array}{ccccccc} & \text{H} & \text{H} & \text{H} & & & \\ & & & & & & \\ \text{HO} & -\text{C} & -\text{C} & -\text{C} & -\text{H} \\ & & & & & & \\ & \text{H} & \text{H} & \text{H} & & & \end{array}$	(iii) Butanon
(d) $\begin{array}{ccccccc} & \text{H} & & \text{H} & & & \\ & & & & & & \\ \text{H} & -\text{C} & & \text{C} & -\text{H} \\ & & & & & & \\ \text{H} & -\text{C} & & \text{C} & -\text{H} \\ & & & & & & \\ \text{H} & -\text{C} & & \text{C} & -\text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & & \end{array}$	(iv) 3-chloro butanoic acid

32.

Section C

- Write the answer of the following questions. [Each carries 3 Marks] [9]
33. Draw the structures for the following compounds.
- (i) Ethanoic acid (ii) Bromopentane*
- (iii) Butanone (iv) Hexanal.
- *Are structural isomers possible for bromopentane ?
34. How would you distinguish experimentally between an alcohol and a carboxylic acid ?
35. How comparison of strength of dilute acetic acid and dilute hydrochloric acid is done ? Explain with the help of proper activity.

Section D

- Write the answer of the following questions. [Each carries 4 Marks] [8]
36. Draw the electron dot structures for
- (A) ethanoic acid (B) H_2S (C) propanone (D) F_2
37. Explain mechanism of reaction of cleaning of soap with the help of proper activity/experiment.

OPEN STUDENT FOUNDATION**CHAPTER:4****STD 10 : SCIENCE****Date : 23/02/24****IMPORTANT QUESTION DAY 4****Section [A] : 1 Marks Questions**

No	Ans	Chap	Sec	Que	Universal_Queld
1.	-	Chap 4	S4	55	QP23P11B1012_P1C4S4Q55
2.	-	Chap 4	S4	8	QP23P11B1012_P1C4S4Q8
3.	-	Chap 4	S4	50	QP23P11B1012_P1C4S4Q50
4.	-	Chap 4	S4	44	QP23P11B1012_P1C4S4Q44
5.	-	Chap 4	S4	34	QP23P11B1012_P1C4S4Q34
6.	-	Chap 4	S5	2	QP23P11B1012_P1C4S5Q2
7.	-	Chap 4	S5	4	QP23P11B1012_P1C4S5Q4
8.	-	Chap 4	S5	7	QP23P11B1012_P1C4S5Q7
9.	-	Chap 4	S5	13	QP23P11B1012_P1C4S5Q13
10.	-	Chap 4	S5	16	QP23P11B1012_P1C4S5Q16
11.	B	Chap 4	S6	43	QP23P11B1012_P1C4S6Q43
12.	C	Chap 4	S6	39	QP23P11B1012_P1C4S6Q39
13.	A	Chap 4	S6	28	QP23P11B1012_P1C4S6Q28
14.	A	Chap 4	S6	30	QP23P11B1012_P1C4S6Q30
15.	A	Chap 4	S6	16	QP23P11B1012_P1C4S6Q16
16.	-	Chap 4	S7	40	QP23P11B1012_P1C4S7Q40
17.	-	Chap 4	S7	37	QP23P11B1012_P1C4S7Q37
18.	-	Chap 4	S7	42	QP23P11B1012_P1C4S7Q42
19.	-	Chap 4	S7	27	QP23P11B1012_P1C4S7Q27
20.	-	Chap 4	S7	59.7	QP23P11B1012_P1C4S7Q59.7
21.	-	Chap 4	S7	59.4	QP23P11B1012_P1C4S7Q59.4

Section [B] : 2 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
22.	-	Chap 4	S3	12	QP23P11B1012_P1C4S3Q12
23.	-	Chap 4	S3	14	QP23P11B1012_P1C4S3Q14
24.	-	Chap 4	S3	4	QP23P11B1012_P1C4S3Q4
25.	-	Chap 4	S3	6	QP23P11B1012_P1C4S3Q6
26.	-	Chap 4	S8	2.1	QP23P11B1012_P1C4S8Q2.1
27.	-	Chap 4	S1	21	QP23P11B1012_P1C4S1Q21
28.	-	Chap 4	S2	9	QP23P11B1012_P1C4S2Q9
29.	-	Chap 4	S2	6	QP23P11B1012_P1C4S2Q6

30.	-	Chap 4	S1	5	QP23P11B1012_P1C4S1Q5
31.	-	Chap 4	S1	26R	QP23P11B1012_P1C4S1Q26R
32.	-	Chap 4	S7	62	QP23P11B1012_P1C4S7Q62

Section [C] : 3 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
33.	-	Chap 4	S8	2.4	QP23P11B1012_P1C4S8Q2.4
34.	-	Chap 4	S8	4.1	QP23P11B1012_P1C4S8Q4.1
35.	-	Chap 4	S1	25	QP23P11B1012_P1C4S1Q25

Section [D] : 4 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
36.	A	Chap 4	S3	5	QP23P11B1012_P1C4S3Q5
37.	-	Chap 4	S1	29R	QP23P11B1012_P1C4S1Q29R

OPEN STUDENT FOUNDATION

CHAPTER:4

STD 10 : SCIENCE IMPORTANT QUESTION DAY 4




Date : 23/02/24

Section A

● Write the answer of the following questions. [Each carries 1 Mark] [21]

1. Hard water has salts of and
 ➡ calcium, magnesium
2. The compounds with identical molecular formula but different structures are called
 ➡ Structural isomers
3. Acetic acid is also known as
 ➡ vinegar
4. Burning a copper wire in the flame of a gas stove gives a flame of colour.
 ➡ black
5. made urea from Ammonium cyanate.
 ➡ Friedrich Wohler
6. Molecular formula of cyclo Hexane is C_6H_6 .
 ➡ False
7. Esters are compounds having foul smells.
 ➡ False
8. The graphite allotrope of carbon is smooth and sticky.
 ➡ True
9. Unsaturated hydrocarbon like propyne which burns with yellow flame and sooty smoke.
 ➡ True
10. The process which gives hydrocarbon unsaturated from alcohol is called dehydration reaction.
 ➡ True
11. The general formula of aldehyde is $C_nH_{2n+1}-CHO$. What will be the value of n for its first member ?
 (A) 1 (B) 0 (C) 0.5 (D) 1.1

Ans. (B) 0

12. Which of the following is correct electron structure of water molecule ?
- (A)  (B)  (C)  (D) $H-\ddot{O}-H$

Ans. (C) 

13. Which catalyst is useful in hydrogenation of vegetable oil ?
 (A) Pd or Ni (B) Reni (C) Pt & Pd (D) Sunlight

Ans. (A) Pd or Ni

14. What is used in medicine Tincture of Iodine ?
 (A) Ethanol (B) Ethanoic acid (C) Sodium acetate (D) Sodium hydroxide

Ans. (A) Ethanol

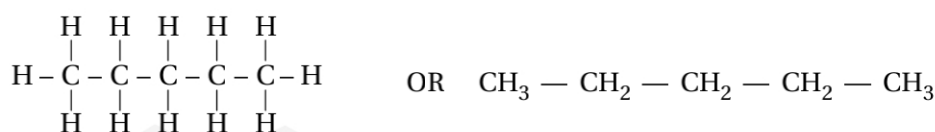
15. Which is a functional group known as aldehyde ?

- ➡ In homologous series, other physical properties such as solubility in a particular solvent also show a similar gradation. But the chemical properties, which are determined solely by the functional group, remain similar in a homologous series.
- ➡ Each member of homologous series can be shown by common molecular formula. E.g., general formula of Alkene series is C_nH_{2n+2} .
- ➡ Like Alkane series,
 CH_4 – Methane, C_2H_6 – Ethane, C_3H_8 – Propane, C_4H_{10} – Butane, C_5H_{12} – Pentane.

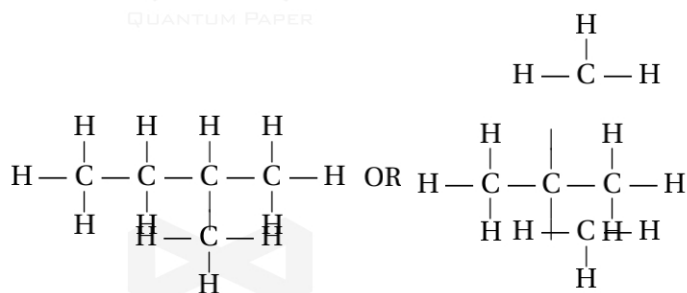
26. How many structural isomers can you draw for pentane ?

- ➡ Pentane (C_5H_{12}) is a structure of five carbon atoms.
- ➡ They can be arranged in either simple chained structure or one or more can be arranged in chain having more than one branches.

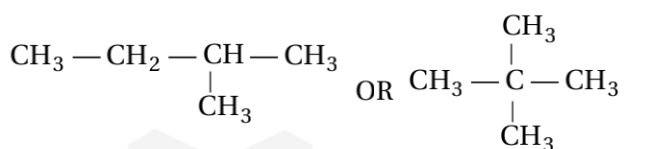
Molecular formula can have following isomers.



Structure having simple chain OR pentane



Isopentane OR Isopentane



2-Methyl butane OR Neopentane

Structure having branched chain

27. Discuss physical properties of Ethanol.

- ➡ Some physical properties of Ethanol are shown below :

Compound	Melting point (K)	Boiling point (K)
Acetic acid (CH_3COOH)	290	391
Chloroform ($CHCl_3$)	209	334
Ethanol (CH_3CH_2OH)	156	351
Methane (CH_4)	90	111

- ➡ (i) Ethanol is liquid at room temperature it can be said from melting and boiling point of ethanol shown in above table.
- (ii) Ethanol is commonly called alcohol and is the active ingredient of alcoholic drinks.

(iii) In addition, because it is a good solvent, it is also used in medicines such as tincture iodine, cough syrups and many tonics.

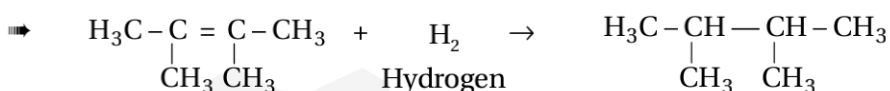
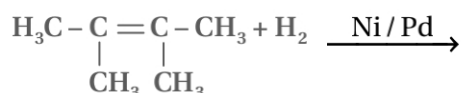
(iv) Ethanol is also soluble in water in all proportions.

(v) Consumption of small quantities of dilute ethanol causes drunkenness. Even though this practice is condemned, it is a socially widespread practice.

(vi) Intake of even a small quantity of pure ethanol (called absolute alcohol) can be lethal.

(vii) Also, long-term consumption of alcohol leads to many health problems.

28. Complete the following reaction and mention the product.



2, 3 dimethyl,

Hydrogen

2 Butane

2, 3 dimethyl butane

Product obtained is 2, 3 dimethyl butane

29. What is soap chemically ? Give its solubility.

Soaps are sodium or potassium salts of long chain carboxylic acid.

Ionic end of soap becomes soluble in water while carbon chain becomes soluble in oil.

30. Give reason : Covalent compounds are non-conductor of electricity.

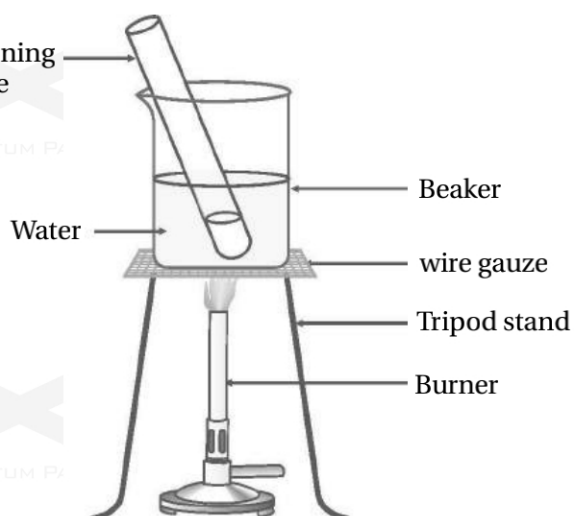
Such bonds which are formed by the sharing of an electron pair between two atoms are known as covalent bonds.

Covalently bonded molecules are seen to have strong bonds within the molecule, but intermolecular forces are weak. This gives rise to the low melting and boiling points of these compounds.

Since the electrons are shared between atoms and no charged particles are formed, such covalent compounds are generally poor conductors of electricity.

31. Explain the activity showing formation of Ester.

Test tube containing reaction mixture

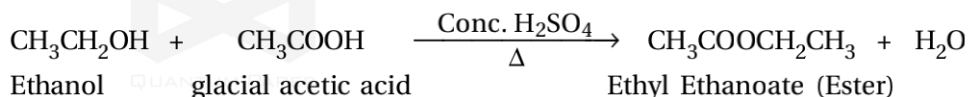


The study of formation and identification of Ester can be done with following activity.

First of all, take 1 mL ethanol (absolute alcohol) and 1 mL glacial acetic acid along with a few drops of concentrated sulphuric acid in a test tube.

- Then heat the test tube in a water bath for at least five minutes as per shown in figure.
- Pour the solution into a beaker containing 20-25 mL of water and smell the resulting mixture.
- Observation and conclusion : It can be concluded by observation from the given activity that absolute ethanol (100% alcohol) forms sweet smelling ester means Ethyl ethanoate in presence of glacial (100%) acetic acid and few drops of conc H_2SO_4 . Conc H_2SO_4 removes H_2O produced during reaction. Therefore equilibrium moves to precursor / forward.

Reaction Equation :



Column-I (Structural formula)	Column-II (Name of the compound)
(a) $\begin{array}{ccccccc} & H & H & H & & & \\ & & & & & & \\ H & -C & -C & -C & -C & -OH \\ & & & & & & \\ & H & Cl & H & O & & \end{array}$	(i) Cyclo Hexane
(b) $\begin{array}{ccccccc} & H & H & & H & & \\ & & & & & & \\ H & -C & -C & -C & -C & -H \\ & & & & & & \\ & H & H & O & H & & \end{array}$	(ii) Propanol
(c) $\begin{array}{ccccccc} & H & H & H & & & \\ & & & & & & \\ HO & -C & -C & -C & -H \\ & & & & & & \\ & H & H & H & & & \end{array}$	(iii) Butanon
32. (d) $\begin{array}{ccccccc} & H & H & & & & \\ & / & \backslash & & & & \\ H & -C & -C & -C & -H \\ & & & & \\ H & -C & -C & -C & -H \\ & & & & \\ H & -C & -C & -C & -H \\ & & & & & & \\ & H & H & & & & \end{array}$	(iv) 3-chloro butanoic acid

- (a - iv), (b - iii), (c - ii), (d - i)

Section C

Write the answer of the following questions. [Each carries 3 Marks]

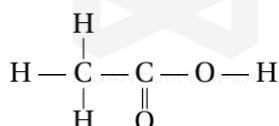
[9]

33. Draw the structures for the following compounds.

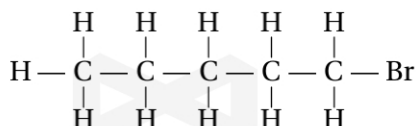
- (i) Ethanoic acid (ii) Bromopentane*
- (iii) Butanone (iv) Hexanal.

*Are structural isomers possible for bromopentane ?

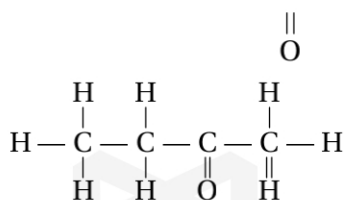
- (i) Ethanoic acid - CH_3COOH



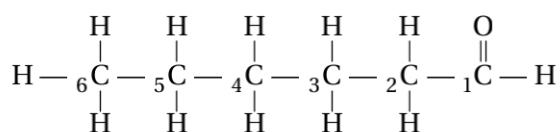
- (ii) Bromopentane [$CH_3CH_2CH_2CH_2CH_2Br$] - [$C_5H_{11}Br$]



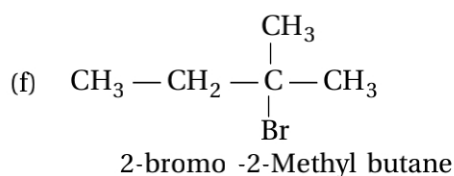
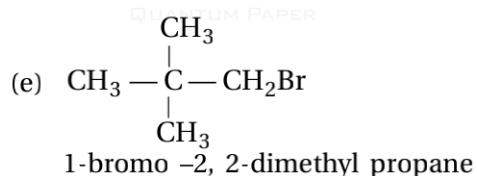
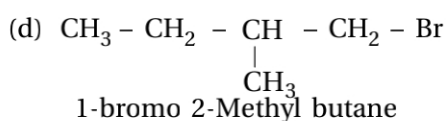
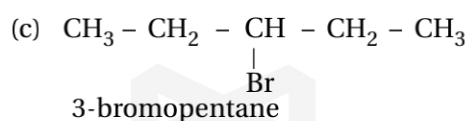
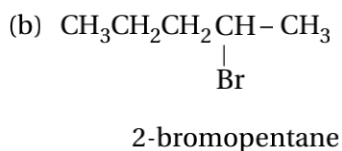
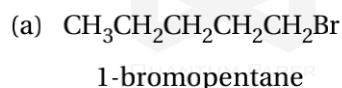
- (iii) Butanone [$CH_3CH_2 - C - CH_3$] [C_4H_8O]



➡ (iv) Hexanal [CH₃CH₂CH₂CH₂CH₂CHO] [C₆H₁₂O]



➡ Yes, structural isomers of bromopentane are possible. They are shown below :

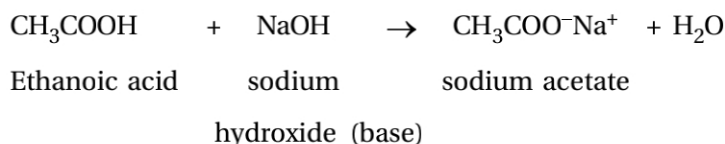


34. How would you distinguish experimentally between an alcohol and a carboxylic acid ?

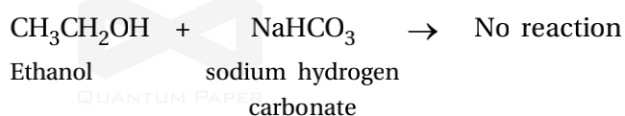
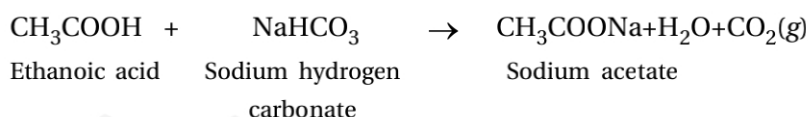
➡ Experimentally Alcohol and carboxylic acid can be separated by following two reactions.

➡ Experimentally Alcohol and carboxylic acid can be separated by following two reactions.

➡ (i) **Reaction with base (alkali)** : Alcohol doesn't react with base like NaOH and KOH. While carboxylic acid (Ethanoic acid) reacts with alkali (NaOH, KOH) and forms salt and water like,



➡ (ii) **Reaction with sodium hydrogen carbonate** : Carboxylic acid immediately reacts with sodium bicarbonate and gives effervescences of CO₂ continually. While Alcohol can not react with sodium bicarbonate.



35. How comparison of strength of dilute acetic acid and dilute hydrochloric acid is done ? Explain with the help of proper activity.

- ➡ Comparison of strength of dilute acetic acid and dilute hydrochloric acid can be explained by following activity.
- ➡ First of all dilute acetic acid (CH_3COOH) and dilute hydrochloric acid like solutions, Litmus paper and substance like universal indicator are collected in the laboratory.
- ➡ Then using litmus paper and universal indicator comparison of pH of both acids, dilute acetic acid and dilute hydrochloric acid is done.
- ➡ Observation : It can be observed during given activity / experiment both dilute hydrochloric acid and dilute acetic acid make blue litmus paper red but this process doesn't say that hydrochloric acid is stronger than acetic acid. But when we do the comparison of pH of aqueous solutions of both acids using universal indicator then we get pH of dilute acetic acid near to 4 (yellowish pink colour) while pH of hydrochloric acid is seen near 2 (light pink colour). Therefore it can be said that acetic acid is weaker than hydrochloric acid.
- ➡ Conclusion : It can be concluded from the observation of given activity/experiment that Hydrochloric acid (HCl) gets completely ionized. While acetic acid (CH_3COOH) gets incompletely ionized. Therefore hydrochloric acid is stronger than acetic acid.

Section D

- Write the answer of the following questions. [Each carries 4 Marks]

[8]

36. Draw the electron dot structures for

(A) ethanoic acid

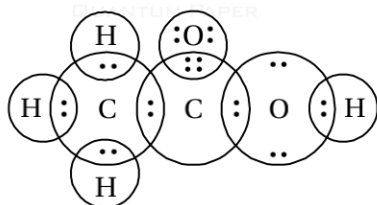
(B) H_2S

(C) propanone

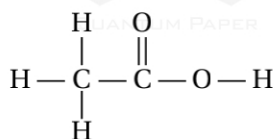
(D) F_2

Ans. (A) ethanoic acid

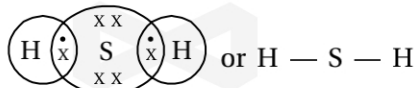
- ➡ (A) ethanoic acid – (CH_3COOH)



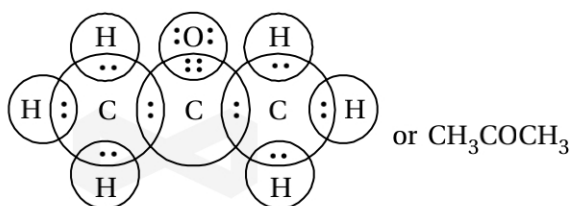
or



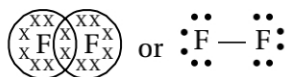
- ➡ (B) H_2S – (Hydrogen Sulphide)



- ➡ (C) Propanone – (CH_3COCH_3)

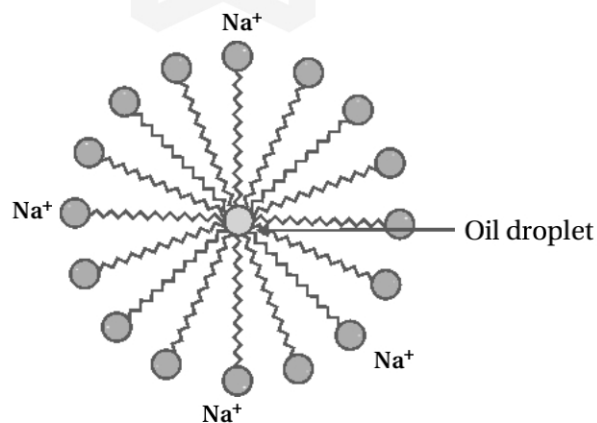


- ➡ (D) F_2 – (Flourine molecule)



37. Explain mechanism of reaction of cleaning of soap with the help of proper activity/experiment.

- ➡ Oil gets dissolved / becomes soluble in soap solution means mechanism of reaction of cleaning soap can be explained by given activity.



Formation of micelles

- ➡ First of all two test tubes are taken.
- ➡ Then take about 10 mL of water each in two test tubes. Add a drop of oil (cooking oil) to both the test tubes and label them as A and B.
- ➡ To test tube B, add a few drops of soap solution.
- ➡ Now shake both the test tubes vigorously for the some period of time.
- ➡ Can you see the oil and water layers separately in both the test tubes immediately after you stop shaking them ?
- ➡ Leave the test tubes undisturbed for some time and observe. Does the oil layer separate out ? In which test tube does this happen first ?
- ➡ Observation and Conclusion : It can be concluded by observation from given activity/experiment that test tube 'B' has cooking oil, water and soap solution. Then the test tube is shaken vigorously and it is kept undisturbed. Then only one layer is observed. It shows that oil is soluble in soap and therefore it is helpful in cleaning work.
- ➡ While test tube 'A' contains cooking oil and water. Therefore it is put aside after shaking it vigorously without disturbing it. Then two different layers are seen. One layer of water and other layer is of oil. That shows oil is not soluble in water. Therefore only water can not clean clothes.
- ➡ Cleaning of soap reaction :
- ➡ This activity demonstrates the effect of soap in cleaning. Most dirt is oily in nature and as you know, oil does not dissolve in water.
- ➡ The molecules of soap are sodium or potassium salts of long-chain carboxylic acids.
- ➡ The ionic-end of soap interacts with water while the carbon chain interacts with oil.
- ➡ The soap molecules, thus form structures called micelles (see Fig.)
- ➡ Where one end of the molecules is towards the oil droplet while the ionic-end faces outside. This forms an emulsion in water. The soap micelle thus helps in pulling out the dirt in water and we can wash our

clothes clean. It is shown in figure.