

NYQs

"Next Year Questions"



Carbon and its Compounds

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Carbon and its Compounds

Q1. Name the functional group present in CH_3COCH_3 .

- (a) Alcohol
- (b) Carboxylic acid
- (c) Ketone
- (d) Aldehyde

Q2. A soap molecule has a

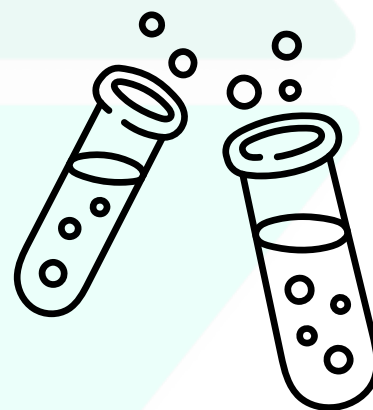
- (a) hydrophobic head and hydrophobic tail
- (b) hydrophobic head and hydrophilic tail
- (c) hydrophilic head and hydrophilic tail
- (d) hydrophilic head and hydrophobic tail

Q3. In a diamond, each carbon atom is bonded to four other carbon atoms to form

- (a) A hexagonal array
- (b) A rigid three-dimensional structure
- (c) A structure in the shape of a football
- (d) A structure of a ring

Q4. The chemical formulae of propane is :

- (a) CH_4
- (b) C_3H_8
- (c) C_4H_{10}
- (d) C_2H_6



Q5. Which of the following belongs to homologous series of alkynes?

C_6H_6 , C_2H_6 , C_2H_4 , C_3H_4

- (a) C_6H_6
- (b) C_2H_4
- (c) C_2H_6
- (d) C_3H_4

Q6. Write the name and formula of the 2nd member of homologous series having general formula $\text{C}_n\text{H}_{2n-2}$.

Q7. Why are detergents better cleansing agents than soaps? Explain.

Q8. How many structural isomers can you draw for pentane?

Q9. Explain the given reactions with the examples

(a) Hydrogenation reaction

(b) Saponification reaction

Q10. Give a chemical test to distinguish between Ethane and Ethene.

Q11. What are the properties of carbon which lead to huge number of carbon compounds we see around us?

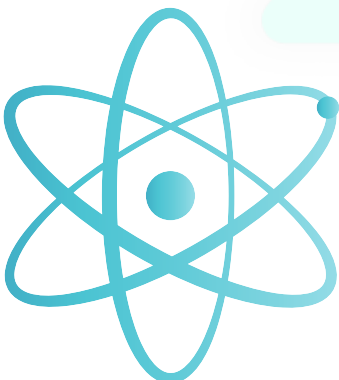
Q12. Draw the structures of the following compounds a) Ethanoic acid

b) Bromopentane c) Butanone

Q13. Write two uses of Ester?

Q14. What is a homologous series? Explain with an example

Q15. Explain mechanism of the cleaning action of soap.



10th Phodenge!



SOLUTION

Ans1. c

Ans2. d

Ans3. b

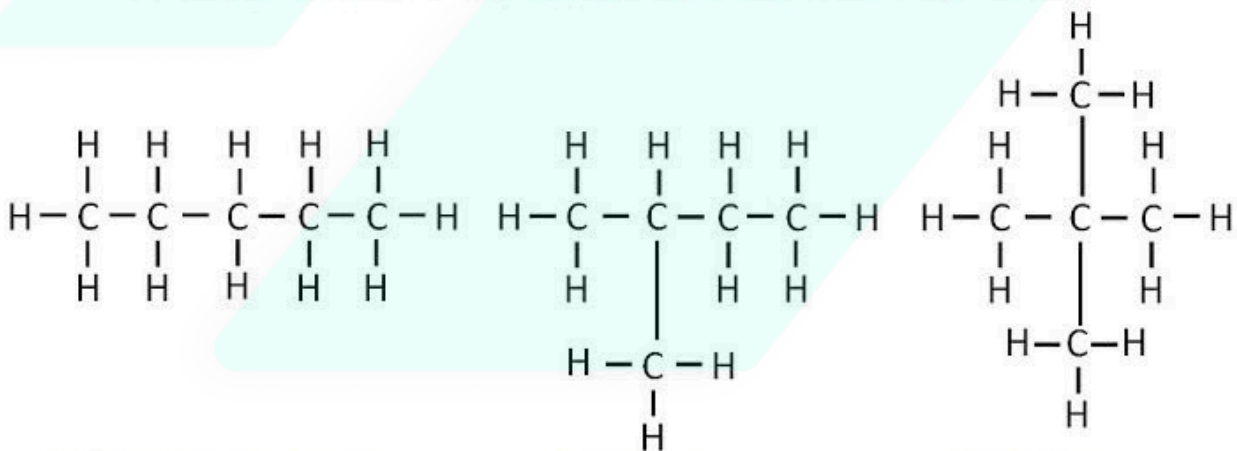
Ans4. b

Ans5. d

Ans 6. The general formula, C_nH_{2n-2} , belongs to the alkyne series. The second member of this series is propyne (C_3H_4), which has the structural formula $CH_3-C\equiv CH$.

Ans 7. Detergents are better cleansing agents than soaps because they can be used even with hard water. Detergents have a stronger cleansing action than soaps and are more soluble in water. Unlike soaps, the charged ends of detergents do not form insoluble precipitates with calcium and magnesium ions present in hard water. When soap is used with hard water, it reacts with these ions to form an insoluble precipitate called scum, which adheres to the fabric, making cleaning difficult.

Ans 8. The structural isomers of pentane are as follows:



Ans 9.(a) The addition of hydrogen to an unsaturated hydrocarbon to form a saturated hydrocarbon is known as a hydrogenation reaction.

Reaction: $CH_2=CH_2 + H_2 \rightarrow CH_3-CH_3$ (in the presence of Ni as a catalyst)

(b) Saponification is the process of preparing soap by the hydrolysis of fats or oils using a base such as sodium hydroxide.



Ans 10. Ethane and ethene can be differentiated using the bromine test. The colour of bromine water is red-brown.

- Unsaturated hydrocarbons decolourise bromine water, while saturated hydrocarbons do not.
- Ethene is an unsaturated compound, and ethane is a saturated compound.
- Ethene will react with bromine water and decolourise it, but ethane will not.

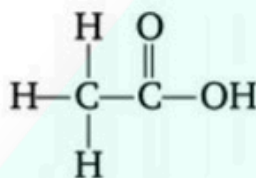
Reactions:

1. $\text{CH}_2=\text{CH}_2 + \text{Br}_2 \rightarrow \text{CH}_2\text{Br}-\text{CH}_2\text{Br}$
2. $\text{CH}_3-\text{CH}_3 + \text{Br}_2 \rightarrow \text{No reaction}$

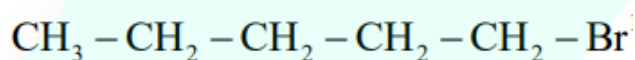
Ans 11. The two properties of carbon that lead to the vast number of carbon compounds are:

1. Catenation: The ability of carbon to form long chains by bonding with other carbon atoms.
2. Tetravalence: Carbon's valency of four allows it to form stable covalent bonds with other elements such as hydrogen, oxygen, nitrogen, etc., by sharing electrons.

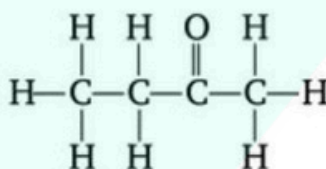
Ans12. a) Ethanoic acid



b) Bromopentane



c) Butanone



Ans13. Uses of esters:

- a) Esters that have fragrant odors are used as a constituent of perfumes, essential oils, food flavorings, cosmetics, etc.
- b) It is used as an organic solvent.

Ans14. A homologous series is a group of compounds with the same functional group, where each successive compound differs by a $-CH_2$ unit (methylene group). For example, alkanes (C_nH_{2n+2}) form a homologous series where methane (CH_4) is the first member, ethane (C_2H_6) is the second

Ans15. Soaps are sodium or potassium salt of fatty acids. Soap molecules have two ends. One end is hydrophilic and another end is hydrophobic. Two molecular ends behave differently. This ionic end is hydrophilic and it is oriented towards water. The other hydrocarbon end is hydrophobic and it is oriented towards dirt which is oily in nature. A micelle formation around the oily dirt takes place. The cleaning of clothes etc takes place when flushed with excess of water; the micelle containing the dirt is removed.