Question-13
What is a homologous series? Explain with an example.
Solution:
Homologous series is a series of compounds with a similar general formula, possessing similar chemical properties due to the presence of the same functional group, and shows a gradation in physical properties as a result of increase in molecular size and mass. For example, methane has a lower boiling point than ethane since it has more intermolecular forces with neighbouring molecules. This is because of the increase in the number of atoms making up the molecule.

Question-14
How can ethanol and Ethanoic acid be differentiated on the basis of their physical and chemical properties?
Solution:
(i) Ethanol has a pleasant smell whereas ethanoic acid has the smell of vinegar.
(ii) Ethanol has a burning taste whereas ethanoic acid has a sour taste.
(iii) Ethanol has no action on litmus paper whereas ethanoic acid turns blue litmus paper red.
(iv) Ethanol has no reaction with sodium hydrogencarbonate but Ethanoic acid gives brisk effervescence with sodium hydrogencarbonate.

Question-15
Why does micelle formation take place when soap is added to water? Will a micelle be formed in other solvents such as ethanol also?
Solution:
Micelle formation takes place when soap is added to water. This is because when soap is added to water in which dirty clothes are soaked, the two parts of the soap molecule dissolves in two different mediums. The organic tail dissolves in the dirt, grime or grease and the ionic head dissolves in water. When the clothes are rinsed or agitated, the dirt gets pulled out of the clothes in the water by the soap molecule. In this way the soap does its cleaning work on dirty and grimy clothes or hands.
The soap molecules actually form a closed structure because of mutual repulsion of the positively charged heads. This structure is called a micelle.

Question-16
Why are carbon and its compounds used as fuels for most applications?
Solution:
Carbon and its compounds are used as fuels for most of the applications because they burn in air releasing a lot of heat energy.

Question-17
Explain the formation of scum when hard water is treated with soap.
Solution:
The precipitate form of scum is formed when soap is used for washing clothes. With hard water, a large amount of soap is wasted

in reacting with the calcium and magnesium ions of hard water to form an insoluble precipitate. The precipitate form formed by the action of hard water on soap, sticks to the clothes being washed and interferes with the cleaning ability of the additional soap. This makes the cleaning of clothes difficult.

Question-18
What change will you observe if you test soap with litmus paper (red and blue)?
Solution:
Soap is the salt of a strong base (NaOH) and a weak acid (carboxylic acid), so a solution of soap in water is basic in nature. Being basic, a soap solution turns red litmus paper blue.

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