

CHEMISTRY STUDY MATERIALS FOR CLASS 10

(NCERT Based notes of Chapter -04)

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CARBON AND ITS COMPOUND

EXERCISE QUESTIONS PAGE NO. 77 and 78

Q6. What is an homologous series? Explain with an example.

Ans: A homologous series is a series of carbon compounds that have different numbers of carbon atoms but contain the same functional group.

Example of homologous series

Alkane series C_nH_{2n+2}

CH_4 Methane, C_2H_6 Ethane

C_3H_8 Propane, C_4H_{10} Butane C_5H_{12} Pentane

It can be noticed that there is a difference of $-CH_2$ unit between each successive compound.

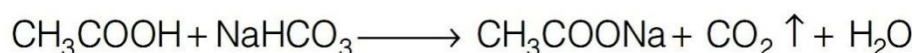
Q7. How can ethanol and ethanoic acid be differentiated on the basis of their physical and chemical properties?

Ans: Distinction based on physical properties

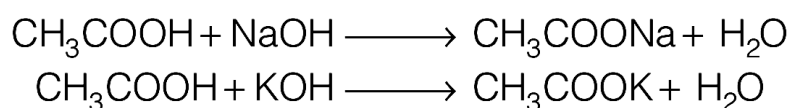
- 1. Smell** Ethanoic acid has a pungent smell. Ethanol has a pleasant smell.
- 2. Melting point** Ethanol has lower melting point (150 K) than ethanoic acid (290 K).
- 3. Physical state** Ethanoic acid is solid (glacial acetic acid) in winters but ethanol is always a liquid.

II. Districition based on chemical properties

(i) **Action with sodium hydrogen carbonate:** On adding a small amount of sodium hydrogen carbonate to ethanoic acid, carbon dioxide gas is evolved with brisk effervescence. However, no such reaction noticed in case of ethanol.



(ii) **Action with caustic alkalies** Ethanoic acids reacts with both sodium hydroxide (NaOH) and potassium hydroxide (KOH) to form corresponding salt and water. Ethanol fails to react with either of these.

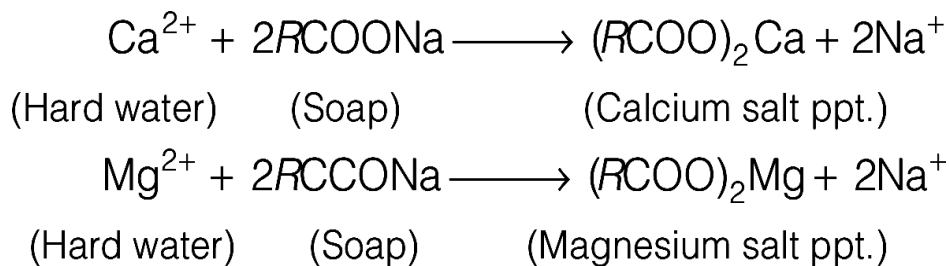


Q8. Why does micelle formation take place when soap is added to water?

Will a micelle be formed in other solvents such as ethanol also?

Ans: A soap is a sodium or potassium salt of long chain fatty acids. It has one polar end and one non-polar end. The polar end is hydrophilic in nature i.e., this end is attracted towards water. The non-polar end is hydrophobic but lyophilic, i.e., it is attracted towards hydrocarbons. When soap is added to water, soap molecules arrange themselves in a cluster to keep the non-polar portion out of water such that the non-polar ends are in the interior of the cluster and the polar ends are on the surface of the cluster. Since the dirt present on clothes is organic in nature and insoluble in water, the hydrophobic ends of the clusters attach themselves to the dirt. This cluster formation in which the dirt is entrapped is the micelle. Micelle formation does not occur in alcohol because the alkyl chain of soap becomes soluble in alcohol.

Reaction taking place are shown below.

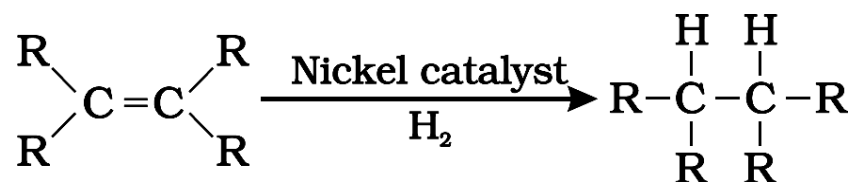


Q11. What change will you observe if you test soap with litmus paper (red and blue)?

Ans: Since soap is basic in nature, it will turn red litmus blue. However, the colour of blue litmus will remain blue.

Q12. What is hydrogenation? What is its industrial application?

Ans: Hydrogenation is the process of addition of hydrogen. Unsaturated hydrocarbons are added with hydrogen in the presence of palladium and nickel catalysts to give saturated hydrocarbons.



This reaction is applied in the hydrogenation of vegetable oils, which contain long chains of unsaturated carbons.
