Topics: Carbon and its Compounds
Subtopics:Soaps and Detergents

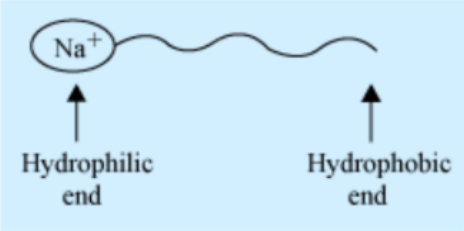
Cleansing Action of Soaps & Detergents

We use soaps and detergents in our homes for almost all cleaning purposes. **What are soaps and detergents?** Soaps are sodium or potassium salts of higher fatty acids such as oleic acid ($C_{17}H_{33}COOH$), stearic acid ($C_{17}H_{35}COOH$), palimitic acid ($C_{15}H_{31}COOH$), etc. On the other hand, detergents are salts of higher sulphonic acids such as dedecylbenzenesulphonate ($C_{18}H_{30}SO_3Na$).

Do you know that soaps and detergents help in dissolving dirt (oil and grease) in Water?

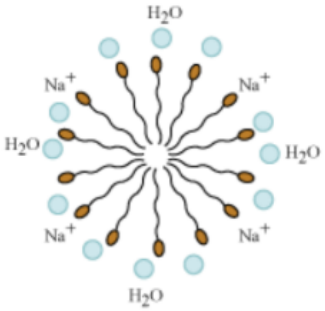
A soap solution or detergent makes dirt soluble in water, thereby cleaning a dirty cloth.

To understand the cleansing action of soap, we first have to understand its structure. Soap has one polar end (the end with sodium or potassium ion) and one non-polar end (the end with fatty acid chain) as shown in the figure. The polar end is hydrophilic in nature i.e., this end is attracted towards water. The non-polar end is hydrophobic, but lypophilic in nature i.e., it is attracted towards hydrocarbons, but not towards water.



A soap molecule

Do you know what happens when soap molecules are added to water? When soap molecules are present in water, the molecules arrange themselves in the form of a cluster in such a manner that their hydrophobic ends are away from the water molecules and their hydrophilic or ionic ends are towards the water molecules (as shown in the following figure). **This is known as micelle formation and the cluster that is formed is called a micelle.**



Micelle formation

Advantage of Detergents over soaps:
Detergents clean efficiently in hard water whereas soaps are rendered inactive in hard water.

However, as detergents are non - biodegradable they cause pollution of water and soil. This is one of the major drawbacks of using detergents.