

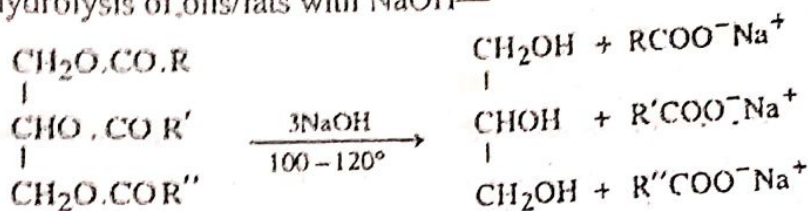
Iodine value of non-drying oils (groundnut, mustard) ranges from 85-105 for semi-drying oils (cotton seed, sesame) from 105-120 while for drying oils (linseed, soyabean) it is above 120.

(c) The Acid value shows the amount of free fatty acids present in an oil or fat. It is the number of milligrams of KOH needed to neutralise the free organic acids present in 1g of fat or oil. It is determined by dissolving a weighed amount of oil and fat in alcohol and titrating against standard alkali, using phenolphthalein indicator. A high acid value shows a stale oil or fat stored under improper condition.

'Difference between saponification & acid values is called an 'ester value of a fat or oil.'

Q.58. What are soaps? Discuss its cleansing action.

Ans. : Soaps are the metallic salts of higher fatty acids. They are obtained by the hydrolysis of oils/fats with NaOH—



Fat/oil (triglycerides)

Glycerol      Mixture of sod. carboxylates

Hard soaps are prepared from cheap oils/fats using NaOH. They have free alkali and used for washing purpose whereas soft soaps are prepared from good oils using KOH. They do not have alkali and give much lather and are used in the manufacture of toilet soaps, shaving cream & shampoo. Shaving cream contains rosin and glycerol along with soap. Rosin gives good lather while glycerol prevents drying. Transparent soaps are prepared by dissolving toilet soaps in alcohol and evaporating the filtrate. Soaps of metals other than Na or K are used for other purposes and not as cleansing agent. Ca & Mg soaps are used as lubricants & driers, Al & Cr soaps in sizing paper, Zn, Fe, CO, Ni soaps for water proofing leather & canvas and lead soaps for manufacturing adhesive.

**Cleansing action :** Dirt particles are held on cloth or skin by some greasy material. On rubbing soap & water, soap solution emulsifies the grease and loosens its grip on dirt and also lowers surface tension of water and thus dirt particles are removed from the cloth or skin.

Q.59. What are detergents? Discuss different types of detergents.

Ans. : Detergents :

Detergents are substances having properties of wetting, emulsifying, dispersing etc. They are better washing agents than soaps as their cleansing action are unaffected in hard water and they have definite germicidal property.

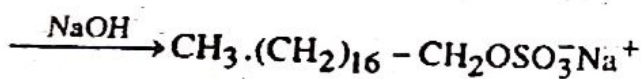
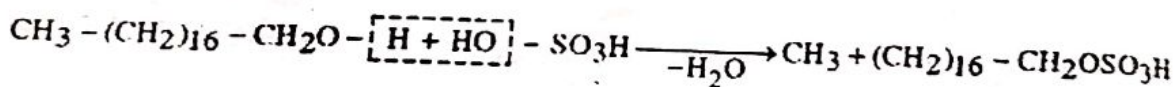


Soaps form precipitates of Mg and Ca salts in hard water. Further, soaps merely remove the bacteria and microbes but do not necessarily destroy them. Therefore, detergents are used for dairy, food equipments, household and hospital disinfectants. However, detergents have not replaced toilet soaps, they look less attractive and dissolve too slow or disintegrate too rapidly in water. The first essential of a detergent solution is to lower surface tension to cause wetting so as to displace the adherent oil. Then the oil is removed by emulsifying and dispersing. For the manifestation of detergent properties, the alkyl group should have not less than 12 C-atoms. Detergents have structures just like soaps—a long hydrocarbon chain of more than 12 C-atoms as non-polar hydrophobic tail and a hydrophilic polar head—

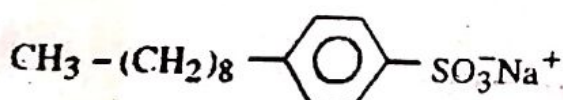


Depending upon the nature of charge on the tail, detergents are of three types—**anionic, cationic and neutral.**

**Anionic detergents** are sodium salts of long chain sulphonates and sulphates. As they have the large part of the molecule as anion, so they are called anionic detergents. These are obtained on treating long chain alcohols with  $H_2SO_4$  to form alkyl sulphates which are then neutralised with alkali to form high molecular mass salts—

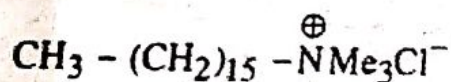


Highly used such type of detergent is alkyl benzene sulphonate—



They are also effective in mild acidic medium as they form soluble alkyl hydrogen sulphate whereas soaps form precipitates of fatty acid in such medium.

**Cationic detergents** are mostly acetates or chlorides of quaternary amines—



Cetyl trimethyl ammonium chloride

They have limited use as they are costly but have germicidal properties.

**Non-ionic detergents** are esters of high molecular mass formed by the reaction of polyethelene glycoyl and stearic acid—