

Chapter-16

Chemistry in Everyday Life

1. Sleeping pills are recommended by doctors to the patients suffering from sleepness but it is not advisable to take their doses with out consultation with the doctor. Why?

Ans. Sleeping pills contain drugs which may be tranquilizers or anti-depressants . They affect the nervous system and induce sleep. However, if these doses are not properly controlled, they may create havoc. They even adversely affect the vital organs of the body. It is advisable to take these sleeping pills under the supervision of a doctor.

2. “Ranitidine is an antacid” With reference to which classification, has this statement been given?

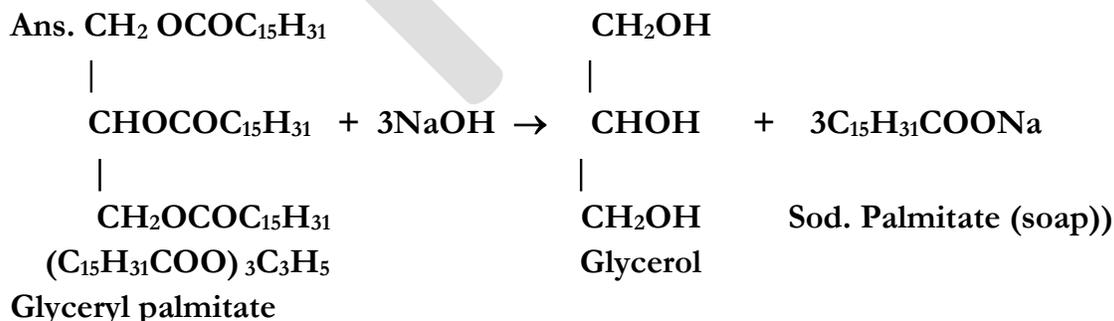
Ans. Ranitidine is labelled as antacid since it is quite effective in neutralizing the excess of acidity in the stomach. It is sold in the market under trade name Zintac.

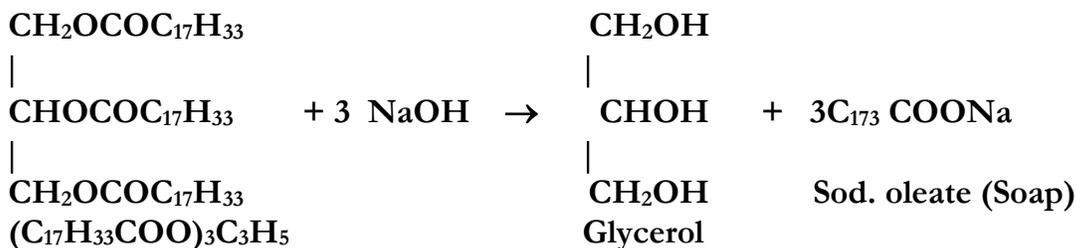
3. Why do we require artificial sweetening agents?

Ans. The commonly used sweetening agent i.e., sucrose is a carbohydrate with molecular formula $C_{12}H_{22}O_{11}$. Since it has high calorific value, it is not recommended to the patients, diabetics in particular which require low calorie diet. Most of the artificial sweeteners are better than sucrose but hardly provide any calories to the body. These are being used as substitutes of sugar.

4. Write Chemical equation for preparing sodium soap from glyceryl oleate and glyceryl palmitate. Structural formulas of these compounds are given:

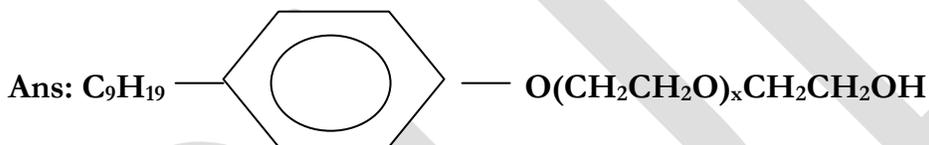
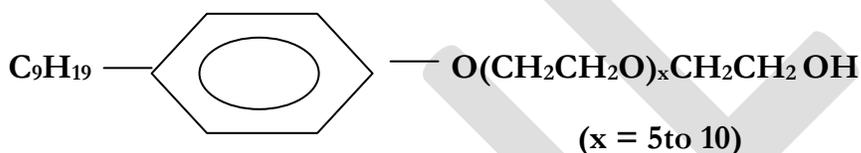
- (i) $(C_{15}H_{31}COO)_3 C_3H_5$ (Glyceryl palmitate) (ii) $(C_{17}H_{33}COO)_3 C_3H_5$ (Glyceryl oleate)





Glyceryl oleate

5. Label the hydrophilic and hydrophobic parts in the following molecule which is a detergent. Also identify the functional groups present.



Hydrophobic part

Hydrophilic part

Detergents are esters formed by the combination between carboxylic acid and polyethylene glycol.

6. Why do we need to classify the drugs in different ways?

Ans Drugs are to attack different targets which are the biomolecules from which our body is made. Moreover, the drugs also differ in action. Therefore, there is a genuine necessity to classify the drugs in different ways.

7. Explain the following as used in medicinal chemistry (a) Lead compounds (b) Target molecules or drug targets.

Ans. (a) Lead compounds are the compounds which are effective in different drugs. They have specific chemical formulas and may be extracted either from natural sources (plants and animals) or may be synthesized in the laboratory.

(b) Target molecules or drug targets.

Ans. The different macromolecules or biomolecules, which are drug targets are carbohydrates, proteins, enzymes, nucleic acids. Out of these, enzymes are the most significant because their deficiency leads to many disorders in the body.

8 Why the medicines should not be taken without consulting doctors?

Ans. No doubt medicines are panacea for most of the body ailments. But their wrong choice and overdose can cause havoc and may even prove to be fatal. Therefore, it is of utmost importance that the medicines should not be given without consulting doctors.

9. Define the term chemotherapy.

Ans: Chemotherapy means the treatment of the disease by means of chemicals that have specific effect upon the disease causing micro-organisms without harming the friendly micro-organisms or bacteria which the body needs.

10. Which forces are involved in holding the drugs to the active sites of enzymes?

Ans. These are different inter-molecular forces like dipolar forces, Hydrogen bonding, van der Waals' forces etc..

11. Antacids and antiallergic drugs interfere with the function of histamines but do not interfere with the function of each other. Explain.

Ans They do not interfere with the functioning of each other because they work on different receptors in the body.

12. Low level of noradrenaline is the cause of depression. What type of drugs are needed to cure this problem? Name two drugs.

Ans: Low level of noradrenaline which acts as a neurotransmitter reduces the signal sending ability to the nerves and the patient suffers from depression. Antidepressants are needed to give relief from depression. These are also called tranquilizers or neurologically active drugs. The two specific drugs are iproniazid and phenelzine.

13. What is meant by the term 'broad spectrum antibiotic'? Explain

Ans. Broad spectrum antibiotics are drugs which are effective against a large number of harmful micro-organisms causing diseases.

14. Why are cimetidine and ranitidine better antacids than sodium bicarbonate or magnesium or aluminium hydroxides?

Ans. Both sodium bicarbonate and hydroxides of magnesium or aluminium are very good antacids since they neutralise the acidity in the stomach. But their prolonged use can cause the secretion of excessive acid in the stomach. This may be quite harmful and may lead to the formation of ulcers. Both cimetidine and ranitidine are better salts without any side effect.

15. Name a substance which can be used as an antiseptic as well as disinfectant.

Ans. About 0.2 percent solution of phenol can act as antiseptic whereas about 1.0 percent solution of the same can act as disinfectant.

16. What are the main constituents of dettol?

Ans. The main constituents of antiseptic dettol are chloroxyleneol and terpenol.

17. What is tincture of iodine? What is its use?

Ans: Tincture of iodine is a dilute solution of iodine (2 to 3 percent) prepared in ethanol. It is a powerful antiseptic particularly in case of fresh wounds.

18. Why is use of aspartame restricted to cold foods and drinks?

Ans: Aspartame is a very good sweetener for foods and drinks. But its use is restricted to cold stuff only. In case these are hot, the sweetener may decompose and it may not be effective any more.

19. Name the sweetening agent used in the preparation of sweets for a diabetic patient.

Ans: Saccharine is the well known sweetening agent which is more than 550 times sweet as compared to sucrose (or sugar). It is commonly used in the preparation of sweets for diabetic patients. Actually, it is not a carbohydrate. Now better sweetening agents are also available.

20. What problem arises by using alitame as artificial sweetener?

Ans: Alitame is no doubt, a very potent sweetener. Its sweetening capacity is more than 2000 times as compared to ordinary cane sugar or sucrose. But sometimes, it becomes quite difficult to control the sweetness level in the food which is actually desired.

21. Why are detergents called soapless soaps?

Ans: Detergents are called soapless soaps because they resemble soaps in their cleansing action but they do not contain the usual chemical contents of soaps i.e., sodium or potassium salts of long chain fatty acids. In other words, we can say that they behave as soaps without being actually soaps.

22. What are biodegradable and non-biodegradable detergents? Give an example of each.

Ans: Detergents are non-biodegradable in the sense that they cannot be degraded or decomposed by the micro-organisms. They mix with water present in rivers, ponds, lakes etc. as such without getting decomposed and thus cause pollution problems. The biodegradable detergents are the ones which can be degraded. These are being synthesised by reducing the branching of the chain. Sodium *n*-dodecylbenzene sulphonate is a biodegradable detergent. Even soaps act as biodegradable detergents.

23. Why do soaps not work in hard water?

Ans: Soaps are water soluble sodium or potassium salts of higher fatty acids like palmitic acid

(C₁₅H₃₁COOH), oleic acid (C₁₇H₃₃COOH) and stearic acid (C₁₇H₃₅COOH). Hard water contains certain calcium and magnesium salts which combine with soaps to form corresponding magnesium compounds. These being insoluble, get separated as curdy white precipitates resulting in wastage of soap.

24. Can you use soaps and synthetic detergents to check the hardness of water?

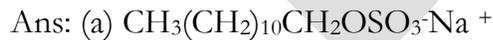
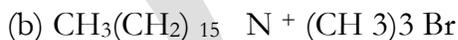
Ans: Soaps can be used to check hardness of water as they will form insoluble precipitates of calcium and magnesium salts on reacting with hard water. Since detergents do not form any precipitate they cannot check hardness of water.

25. If water contains dissolved calcium bicarbonate, out of soaps and synthetic detergents, which one will you use for cleansing clothes?

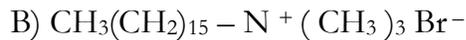
Ans: Calcium bicarbonate makes water hard. Soap (RCOONa) will react with the salt to form corresponding calcium salt which will be precipitated and wasted. The synthetic detergents are chemically different from soaps. They will not react with the calcium bicarbonate and can be used for cleaning dirty clothes without being precipitated. In other words, there will be no wastage when the detergents are used.



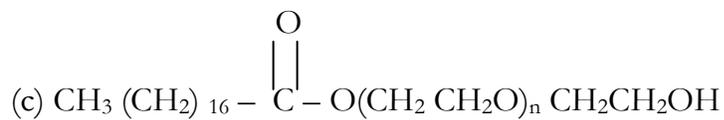
26. Label the hydrophilic and hydrophobic parts in the following compounds.



(Hydrophobic) (Hydrophilic)



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27. Label the hydrophilic and hydrophobic parts in the following compounds.

a) CH₂(CH₂)₁₀CH₂OSO₃Na # (B) CH₃(CH₂)₁₅N + (CH₃)₃Br –

C) CH₃(CH₂)₁₆ – COO(CH₂CH₂O)_nCH₂CH₂OH.

Ans: (a) CH₃(CH₂)₁₀CH₂OSO₃-Na +

B) CH₃(CH₂)₁₅ – N + (CH₃)₃Br –

(Hydrophobic) (Hydrophilic)

(Hydrophobic) (Hydrophilic)



(Hydrophobic)

(Hydrophilic)

PLEASE