



16.11. Why are cimetidine and ranitidine better antacids than sodium hydrogencarbonate or magnesium or aluminium hydroxide?

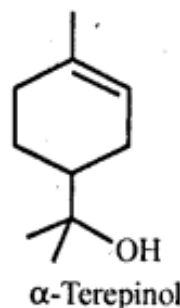
Ans: If excess of  $\text{NaHCO}_3$  or  $\text{Mg(OH)}_2$  or  $\text{Al(OH)}_3$  is used, it makes the stomach alkaline and thus triggers the release of even more HCl which may cause ulcer in the stomach. In contrast, cimetidine and ranitidine prevent the interaction of histamine with the receptor cells in the stomach wall and thus release of HCl will be less as histamine stimulates the secretion of acid.

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

Ans: 0.2% solution of phenol acts as antiseptic while 1% solution acts as a disinfectant.

16.13. What are the main constituents of dettol?

Ans: Chloroxylenol and  $\alpha$ -terpineol in a suitable solvent.



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

Ans: 2-3% solution of iodine in alcohol and water is called tincture of iodine. It is a powerful antiseptic. It is applied on wounds.

16.15. What are food preservatives?

Ans: Chemical substances which are used to protect food against bacteria, yeasts and moulds are called preservatives. For example, sodium benzoate and sodium metabisulphite.

16.16. Why is the use of aspartame limited to cold foods and drinks?

Ans: This is because it decomposes at baking or cooking temperatures and hence can be used only in cold foods and drinks as an artificial sweetener.

16.17. What are artificial sweetening agents? Give two examples.

Ans: Artificial sweeteners are chemical substances which are sweet in taste but do not add any calories to our body. They are excreted as such through urine. For example, saccharin, aspartame, alitame etc.

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

Ans. Saccharine, aspartame or alitame may be used in the preparation of sweets for a diabetic patient.

16.19. What problem arises in using alitame as artificial sweetener?

Ans. Alitame is a high potency artificial sweetener. Therefore, it is difficult to control the sweetness of the food to which it is added.

16.20. How are synthetic detergents better than soaps?

Ans. They can be used in hard water as well as in acidic solution. The reason being that sulphonic acids and their calcium and magnesium salts are soluble in water thus they do not form curdy white precipitate with hard water but the fatty acids and their calcium and magnesium salts of soaps are insoluble. Detergents also work in slightly acidic solution due to formation of soluble alkyl hydrogen sulphates. Soaps react with acidic solution to form insoluble fatty acids.

16.21. Explain the following terms with suitable examples:

(i) cationic detergents

(ii) anionic detergents and

(iii) non-ionic detergents

Ans:

(i) Cationic detergents: These are quaternary ammonium salts, chlorides, acetates, bromides etc containing one or more long chain alkyl groups. For example, cetyltrimethyl ammonium chloride.

(ii) Anionic detergents are called so because a large part of their molecules are anions. These are of two types:

(a) Sodium alkyl sulphates: For example, sodium lauryl sulphate,  $C_{11}H_{23}CH_2OSO_3^- Na^+$ .

(b) Sodium alkylbenzenesulphonates. For example, sodium 4-(1-dodecyl) benzenesulphonate (SDS).



(iii) Neutral or non-ionic detergents: These are esters of high molecular mass alcohols with fatty acids. These can also be obtained by treatment of long chain alcohols by with excess of ethylene oxide in presence of a base. For example, polyethylene glycol stearate,  $CH_3(CH_2)_{16}COO$

$(CH_2CH_2O)_{11} CH_2CH_2OH$  Polyethylene glycol stearate.

16.22. What are biodegradable and non-biodegradable detergents?

Give one example of each.

Ans: Detergents having straight chain hydrocarbons are easily degraded (or decomposed) by microorganisms and hence are called biodegradable detergents while detergents containing branched hydrocarbon chains are not easily degraded by the microorganisms and hence are called non-biodegradable detergents. Consequently, non-biodegradable detergents accumulate in rivers and water ways thereby causing severe water pollution. Examples of biodegradable detergents are sodium lauryl sulphate, sodium 4-(1-dodecyl) benzenesulphonate and sodium 4-(2-dodecyl) benzenesulphonate.

Examples of non-biodegradable detergents is sodium 4-(1, 3,5,7 - tetramethyloctyl) benzene sulphonate.

16.23. Why do soaps not work in hard water?

Ans: Hard water contains calcium and magnesium salts. Therefore, in hard water soaps get precipitated as calcium and magnesium soaps which being insoluble stick to the clothes as gummy mass.

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

Ans: Soaps get precipitated as insoluble calcium and magnesium soaps in hard water but detergents do not. Therefore, soaps but not synthetic detergents can be used to check the hardness of water.

16.25. Explain the cleansing action of soaps.

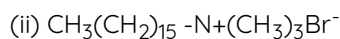
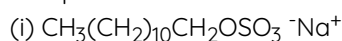
Ans: Cleansing action of soaps : Soaps contain two parts, a large

hydrocarbon which is a hydrophobic (water repelling) and a negative charged head, which is hydrophilic (water attracting). In solution water molecules being polar in nature, surround the ions & not the organic part of the molecule. When a soap is dissolved in water the molecules gather together as clusters, called micelles. The tails stick inwards & the head outwards. The hydrocarbon tail attaches itself to oily dirt. When water is agitated, the oily dirt tends to lift off from the dirty surface & dissociates into fragments. The solution now contains small globules of oil surrounded detergent molecules. The negatively charged heads present in water prevent the small globules from coming together and form aggregates. Thus the oily dirt is removed from the object.

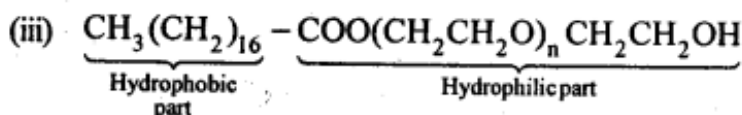
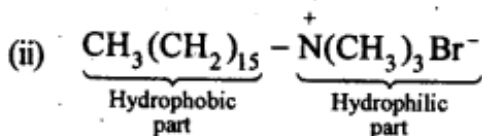
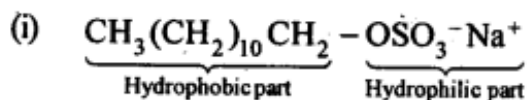
16.26. If water contains dissolved calcium hydrogencarbonate, out of soaps and synthetic detergents, which one will you use for cleaning clothes?

Ans: Calcium hydrogencarbonate makes water hard. Therefore, soap cannot be used because it gets precipitated in hard water. On the other hand, a synthetic detergent does not precipitate in hard water because its calcium salt is also soluble in water. Therefore, synthetic detergents can be used for cleaning clothes in hard water.

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



Ans:



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