CHEMISTRY IN EVERY DAY LIFE

Short Answer Questions:

****1. What are analgesics and food preservatives? Give example?**

Ans. Analgesics are drugs that reduce or totally abolish pain without causing disturbances of nervous system. There are two types of analgesics

i. Narcotic analgesics **E.g.:** Morphine

ii. Non-narcotic analgesics **E.g.:** Aspirin, ibuprofen

The chemical substances are added to the food to enhance the appeal and to preserve (To store) the food for a long time. These are known as food preservatives.

E.g.: Sodium benzoate, BHT and BHA

****2. What are antibiotics? What is meant by the term 'broad spectrum antibiotics'? Give the characteristics of antibiotics?**

Ans. Antibiotics: Antibiotics are chemical substances produced by micro-organism (bacteria, fungi and mould) which prevent the growth or kill other micro-organisms.

E.g.: Penicillin, benzyl penicillin, para hydroxy benzyl penicillin

Antibiotics which kill or inhibit a wide range of harmful or disease-causing bacteria are called broad spectrum antibiotics. These are equally effective against both gram -positive and gram -negative bacteria.

E.g.: Ampicillin and Amoxicillin (both are synthetic modifications of penicillin).

Characteristics of antibiotics are -

i. An antibiotic must be a product of metabolism

ii. It should be effective in low concentration

iii. It should retard the growth or survival of micro organism.

3. How do antiseptics differ from disinfectants? Give one example of each?

Ans. Antiseptics are the chemical substance which prevent the growth of microorganisms and are capable of killing them without harming the human tissues. These are applied on wounds, ulcers, cuts and diseased skin surfaces.

Examples: Dettol, savlon, furacin, saframycin etc.

Disinfectants are the chemical substances which kill microorganisms but they are unsafe for living tissues. These are used for the objects as in toilets, drains, floors etc.

For Example: Phenol (1% solution) and chlorine (0.2 to 0.4 ppm).

* The same substance can behave as antiseptic and disinfectant.

E.g.: 0.2% phenol solution is antiseptic and 1.0% phenol solution is disinfectant

***4. What are i. antacids ii). Antihistamines? Give example?**

Ans. i. Chemical compounds which neutralise the excess acid in stomach and maintain pH to normal level are called antacids.

E.g.: Weak bases like $Mg(OH)_2$, $Al(OH)_3$ gel etc

Omprazole and lansoprazole are used as antacids to prevent the formation of acid in the stomach.

ii. Drugs that inhibit the action of histamine which stimulates the formation of pepsin and HCl in the stomach are called antihistamines. These prevent the interaction of histamine with receptors present in the stomach wall

E.g.: Ranitidine; Cimetidene

***5). Write notes on A). Artificial sweetening agents B). Antioxidants in food C). Food preservatives?**

Ans. a. **Artificial sweetening agents:** Artificial sweetening agents are the chemical substances which provide sweetness to the food without increasing the calories to the body.

E.g.: saccharin, aspartame, sucralose etc.

These are used in the preparation of sweets for a diabetic patient. Alitame is a high potency artificial sweetener. Therefore, it becomes difficult to control the level of sweetness while using it.

b. **Antioxidants in food:** The chemical substance that retards the action of oxygen on food during preservation is called antioxidant. These are more reactive towards oxygen than the food material which they are protecting.

E.g.: Butylated hydroxy toluene (BHT) and butylated hydroxy anisole (BHA) are the two most familiar antioxidants. SO_2 and sulphites are antioxidants used for wine and beer.

c. Food preservatives: Chemical substances which are used to protect food against bacteria, yeasts, moulds etc., are called food preservatives.

E.g.: sodium meta bisulphite, sodium benzoate etc. Sugar, common salt, vegetable oils are also good food preservatives.

****6.** **Explain the following terms with suitable examples:**

(i) Cationic detergents; (ii) Anionic detergents (iii) Non-ionic detergents.

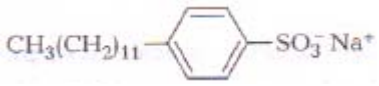
Ans. (i) **Cationic detergetns:** These are quaternary ammonium salts of amines with acetates, chlorides or bromides**. Example:** Cetyl trimethyl ammonium bromide.

(ii) **Anionic detergents:** These detergents have large anionic part in their molecules. These are of two types:

(a) **Sodium alkyl sulphates:** For example, Sodium lauryl sulphate

i.e. $CH_3(CH_2)_{10}CH_2OSO_3Na^+$.

(b) **Sodium alkyl benzene sulphonates**: For example, sodium dodecyl benzene sulphonate.



(iii) **Non-ionic detergents:** These are esters of high molecular mass alcohols with fatty acids. For example, Polyethylene glycol stearate.

$CH_3(CH_2)_{16}COO(CH_2CH_2O)_n\ CH_2CH_2OH$.

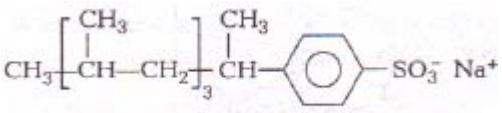
7. What are biodegradable and non-biodegradable detergents? Give one example of each.

Ans. Biodegradable detergents: Cleansing agents or detergents which are decomposed by microbes are called biodegradable detergents. Their molecules have less branching.

E.g.: Sodium n-dodecyl benzene sulphonate Soap is also a biodegradable detergent (not synthetic). Such detergents do not create water pollution.

Non-biodegradable detergents: The detergents which are not decomposed by microbes are called non-biodegradable. When go to water sources, they create water pollution. These have more branching in their structure.

E.g.: ABS and most of the synthetic detergents.

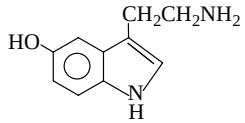


Non-biodegradable ABS detergent

***8.Give the structures of the following**

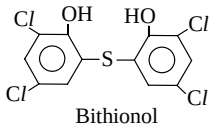
a). Serotinin **b) Bithinol** **c) Chloramphenicol** **d) Saccharin.**

Ans. a)



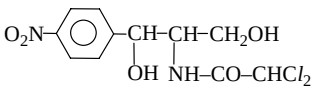
Serotonin

b)

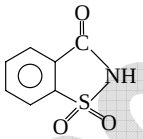


Bithionol

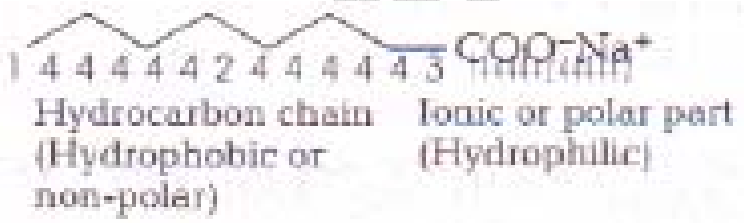
c)



d)

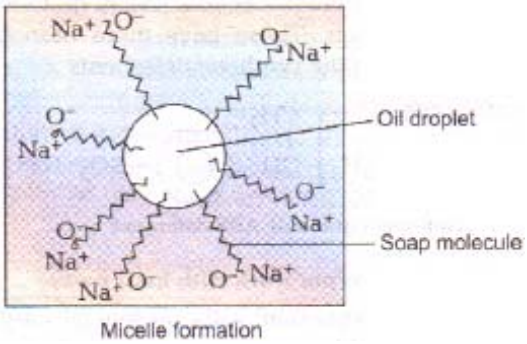


9. Explain the cleansing action of soaps?



Ans. Soap molecule can be represented as

Hydrocarbon chain is water repelling and ionic part is water attracting. When soap is dissolved in water and a dirty cloth is agitated in the solution, the oily dirt attaches to the hydrocarbon part while water attaches to the ionic part. Now these soap molecules arrange themselves in the form of micelles. As the mixture is agitated the dirt particles leave the cloth and get attached to the soap molecules. The negative charges of micelles prevent the dirt to form aggregates. Thus, soap removes dirt by reducing the surface tension of water.



Micelle formation

Very Short Answer Questions

1. While antacids and anti allergic drugs interfere with the function of histamines. Why do not these interfere with the function of each other?

A: Anti allergic drugs blocks the histamine receptors thereby preventing the allergic properties have no effect on the production of HCl. But antacids reduce acid levels which cause ulcers.

2. What are tranquilizers? Give example?

Ans. Drugs used in the management and treatment of stress and mental diseases are called tranquilizers.

E.g.: Barbituric acid, Luminal and Valium

3. What are narcotic analgesics? Give example?

Ans. Narcotic analgesics are addictive drugs. They are derivatives of opium. These are used for the relief of severe pains such as post operative pain, cardiac pain, cancer pain

E.g.: Morphine, codeine etc

4. What are non-narcotic analgesics? Give example?

Ans. Non-narcotic analgesics have no addictive properties. They are used to relieve mild aches like backache and headache.

E.g.: Aspirin, Ibuprofen

5. What are anti microbials?

Ans. Drugs used to cure diseases caused by microorganisms or microbes such as bacteria, viruses, fungi etc. are called antimicrobials

E.g.: Lysozyme, Lactic acid

6. What are the main constituents of dettol?

Ans. The main constituents of dettol are chloroxylenol and terpineol

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

Ans. 2-3% iodine in alcoholic aqueous solution is known as tincture of iodine. It is applied on wounds

8. What are anti fertility drugs? Give examples?

Ans. Chemical substances which are used to check pregnancy in women are called anti fertility drugs or birth control drugs or oral contraceptives.

E.g.: Norethindrone, Etynylestradiol , Mifepristone etc.

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

Ans. Aspartame is a methyl ester of di peptide. It is limited to cold foods and drinks because it decomposes at cooking temperature.

10. What is the difference between soap and a synthetic detergent?

Ans. Soap is sodium or potassium salt of higher fatty acid, whereas synthetic detergents are sodium salts of sulphonated long chain alcohols or may be quaternary ammonium salts of amine. Soaps cannot give foam with hard water whereas synthetic detergents give foam with hard water.

11. What is soapnification?

Ans. preparation of Soap by heating fat i.e glyceryl ester of fatty acid with aqueous sodium hydroxide solution is called saponification.

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

Ans. Calcium hydrogen carbonate reacts with soap to form insoluble compound. It reduces the cleaning capacity of the soap.

$\underset{\text{Soap}}{3RCOONa} + Ca(HCO_3)_2 \longrightarrow \underset{\text{(ppt)}}{(RCOO)_2 Ca\downarrow} + 2NaHCO_3$. Synthetic detergents do not form such compounds .so they can be used for cleaning clothes with water containing dissolved $Ca(HCO_3)_2$.