

**NCERT SOLUTIONS  
CLASS-XII CHEMISTRY  
CHAPTER-16**

**CHEMISTRY IN EVERYDAY LIFE**

**Question 1:**

*Why should we distinguish drugs in different ways?*

**Answer :**

The reason for classification of drugs are as follows:

**(i) On the basis of pharmacological effect:**

This classification is useful for doctors. It provides a whole range of drugs for the classification of drugs for various diseases

**(ii) On the basis of drug action:**

This is based on the action of a drug on a particular biochemical process

Thus this classification is important.

**(iii) On the basis of chemical structure:**

The range of drugs sharing common structural features and having similar pharmacological activity.

**(iv) On the basis of molecular targets:**

Some drugs have the same mechanism of action on targets. This classification is useful in such cases.

**Question 2:**

*Explain drug targets or target molecules used in medicinal chemistry.*

**Answer**

Drug targets are the key molecule that is responsible for certain metabolic pathways that can cause particular diseases. Proteins, nucleic acids, carbohydrates, and lipids are drug targets.

Chemical agents that are used to block these target molecules by fusing with the active sites of key molecules are called drugs.

**Question 3:**

*Give some macromolecules that are chosen as drug targets.*

**Answer**

Carbohydrates, lipids, proteins, and nucleic acids are the macromolecules that are chosen as drug targets

**Question 4:**

*Medicine should not be taken without consulting a doctor. Why is it like that?*

**Answer**

Medicines should not be taken without consulting a doctor because it can bind to more than one receptor site. Thus it can be harmful to some receptor sites. Medicines, when taken in higher doses, can cause harmful effects. So medicines can be poisonous.

**Question 5:**

*What is chemotherapy?*

**Answer**

Chemotherapy is the use of chemicals for therapeutic effects. Using chemicals for prevention, diagnosis and treatment of diseases are examples

**Question 6:**

*Name the forces which are involved in holding the drugs to the active site of enzymes?*

**Answer**

The forces responsible are

- (1) Ionic bonding
- (2) Hydrogen bonding
- (3) Dipole – dipole interaction
- (4) van der Waals force

**Question 7:**

*Antacids and antiallergic drugs intervene with the function of the histamines, and why do they not intervene with each other?*

**Answer**

Certain drugs affect particular receptors only. Antacids and antiallergic drugs do not intervene with each other because they work on different receptors. This is the reason why antacids and antiallergic drugs intervene with the function of histamines but not with each other.

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**Question 8:**

**Level of noradrenaline if low can cause depression. Name the kind of drugs used to solve this problem? Give the names of two drugs.**

**Answer**

Anti-depressant drugs are used to reduce the effect of depression. These drugs contain enzymes which catalyze the degradation of the noradrenaline, neurotransmitter. Therefore the neurotransmitter is metabolized slowly and can activate the receptor for a larger period of time.

Two anti-depressant drugs are:

1. Iproniazid
2. Phenelzine

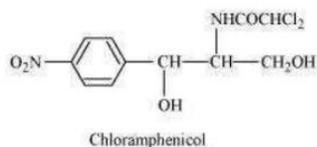
**Question 9:**

**Explain the term 'broad spectrum antibiotics'?**

**Answer**

Antibiotics which are effective against a large range of gram-negative and gram-positive bacteria are known as broad-spectrum antibiotics. Eg: Chloramphenicol

This is used for the treatment of acute fever, typhoid, meningitis, dysentery, pneumonia and some forms of urinary infections. Vancomycin and ofloxacin are the other two broad spectrum antibiotics. Amoxicillin and ampicillin –synthetically modified from penicillin– are also broad spectrum antibiotics.



**Question 10:**

**How are antiseptics different from disinfectants? Give one example of each.**

**Answer**

Antiseptics and disinfectants are really effective against micro-organisms. Antiseptics are used for living tissues like cuts, wounds, diseased skin surfaces and ulcers, while disinfectants used for objects such as floors, drainage system, instruments, etc. Disinfectants are harmful to the living tissues.

Iodine is a strong antiseptic. Tincture of iodine is applied to wounds. 1 percent solution of phenol is used as a disinfectant.

**Question 11:**

**Ranitidine and cimetidine better antacids than sodium hydrogen carbonate or aluminum hydroxide or magnesium. Explain**

**Answer**

Magnesium hydroxide, sodium hydrogen carbonate, and aluminum hydroxide are antacids which neutralize excess hydrochloric acid in the stomach. The reason for the release of excess acid, however, remains untreated.

Cimetidine and ranitidine are good antacids as they control the cause of acidity. These drugs avoid the interaction of histamine with the receptors present in the stomach walls and hence can decrease the amount of acid released by the stomach.

**Question 12:**

**Which substance can be used as an antiseptic as well as a disinfectant?**

**Answer**

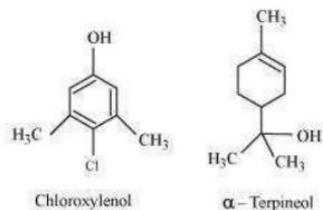
The substance which can be used as an antiseptic, as well as a disinfectant, is phenol. 0.2 percent solution of phenol can be used as an antiseptic and for disinfectant 1 percent of the solution should be used.

**Question 13:**

**What are the main constituents of dettol?**

**Answer**

The main constituents of dettol are chloroxylenol and  $\alpha$  – *terpineol*.



**Question 14:**

**What meant by tincture of iodine? Mention its use?**

**Answer**

2-3 percent of iodine in alcohol-water mixture is referred as tincture of iodine and it is mainly applied to wounds.

**Question 15:**

**What are Food preservatives?**

**Answer**

Chemicals which prevent microbial growth is referred to as Food preservatives. They reduce spoilage. Sugar, table salt, vegetable oil, salts of propanoic acid and sodium benzoate ( $C_6H_5COONa$ ), are some food preservatives.

**Question 16:**

**Why is aspartame used for cold foods and drinks only?**

**Answer**

Aspartame is unstable at cooking temperature and hence their use is only limited to cold foods and drinks.

**Question 17:**

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

**Answer**

Those chemicals that sweeten food are referred to as artificial sweetening agents. They do not add calories to our body and also do not harm the human body. Some artificial sweeteners are sucralose, aspartame, alitame and saccharin.

**Question 18:**

**Give the sweetening agent which is used in the preparation of sweets for diabetic patients.**

**Answer**

Saccharin, aspartame and alitame are sweetening agents used in preparing sweets for diabetic patients.

**Question 19:**

**What is the disadvantage in using alitame as an artificial sweetener?**

**Answer**

Alitame is a high potency sweetener. It is difficult to control the sweetness of food while using alitame as an artificial sweetener.

**Question 20:**

**Why is synthetic detergents better than soap?**

**Answer**

Synthetic detergents work both in soft water and hard water while soaps work in soft water. Soaps are not effective in hard water. Therefore, synthetic detergents are better than soaps.

**Question 21 :**

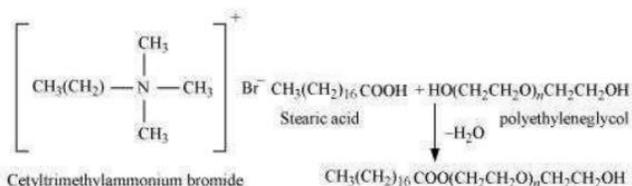
*illustrate with examples the cationic detergent, anionic detergent and non-ionic detergent*

**Answer**

Quaternary ammonium salts of acetates, chlorides, or bromides are usually called Cationic detergents.

Cationic detergents are named so because of the reason that the cationic part of the above compound detergents has a extended hydrocarbon chain and a positive charge on the N atom.

eg : cetyltrimethylammonium bromide



**(ii) Anionic detergents**

following are the type of anionic detergents :

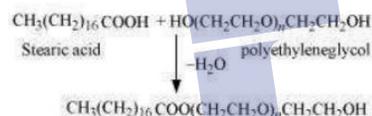
1. Sodium alkyl sulphates: such detergents are basically sodium salts of long chain alcohols. They are made by reacting such alcohols by concentrated sulphuric acid and later

reacting by sodium hydroxide. Suitable Examples of such detergents are sodium lauryl sulphate ( $\text{C}_{11}\text{H}_{23}\text{CH}_2\text{OSO}_3^- \text{Na}^+$ ) and sodium stearyl sulphate ( $\text{C}_{17}\text{H}_{35}\text{CH}_2\text{OSO}_3^- \text{Na}^+$ ).

2. Sodium alkylbenzenesulphonates: such detergents are sodium salts of long chain alkylbenzenesulphonic acids. They are synthesized by Friedel-Crafts alkylation of benzene along with long chain alkyl halides or alkenes. The resultant product is initially reacted with concentrated sulphuric acid and later reacted with sodium hydroxide. An example of anionic detergents is Sodium 4-(1-dodecyl) benzenesulphonate (SDS)

**(iii) Non-ionic detergents**

molecules of such detergents have no ions. They are a good example of esters of alcohols which have high molecular mass. These are prepared by reacting stearic acid and polyethylene glycol.



**Question 22:**

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

**Answer**

Biodegradable detergents are detergents which are degraded by bacteria. They have straight hydrocarbon chains. For example: sodium lauryl sulphate

Non-biodegradable detergents are detergents which cannot be degraded by bacteria.

They have highly-branched hydrocarbon chains. For example: sodium -4- (1, 3, 5, 7- tetra methyl octyl) benzene sulphonate

**Question 23:**

*Explain why soaps do not work in hard water?*

**Answer**

Long-chain fatty acids of sodium or potassium salts are present in soaps. Magnesium and calcium are contained in the hard water. Insoluble calcium or magnesium salts of fatty acids are formed when the ions displace sodium or potassium on dissolving soaps in hard water.

These insoluble salts separate as scum.

This is the reason why soaps do not work in hard water.

**Question 24:**

*Which one should be used for finding the hardness of water, soaps or synthetic detergents?*

**Answer**

Soaps will precipitate in hard water but it won't get precipitated in soft water and hence it can be used for finding the hardness of water. Synthetic detergents, on the other hand, will not get precipitated both in hard water and soft water and cannot be used for finding the hardness of water.

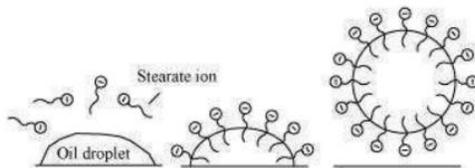
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**Question 25:**

**Explain the cleansing action of soaps?**

**Answer**

Soap molecules form micelles around an oil droplet (dirt) in such a way that the hydrophobic parts of the stearate ions attach themselves to the oil droplet and the hydrophilic parts project outside the oil droplet. Due to the polar nature of the hydrophilic parts, the stearate ions (along with the dirt) are pulled into water, thereby removing the dirt from the cloth.



**Question 26:**

**You have water with dissolved calcium hydrogen carbonate. Will you use soap or synthetic detergents for cleaning clothes in this water? Explain**

**Answer**

Usually, synthetic detergents are used for washing clothes. Soaps when dissolved in water containing calcium ions, these ions form insoluble salts which is of no use. Synthetic detergents are dissolved in water containing calcium ions, these ions form soluble salts that act as cleansing agents.

**Question 27:**

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

- (i)  $\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{OSO}_3^-\text{Na}^+$
- (ii)  $\text{CH}_3(\text{CH}_2)_{15}\text{N}^+(\text{CH}_3)_3\text{Br}^-$
- (iii)  $\text{CH}_3(\text{CH}_2)_{16}\text{COO}(\text{CH}_2\text{CH}_2\text{O})_n\text{CH}_2\text{CH}_2\text{OH}$

**Answer**

