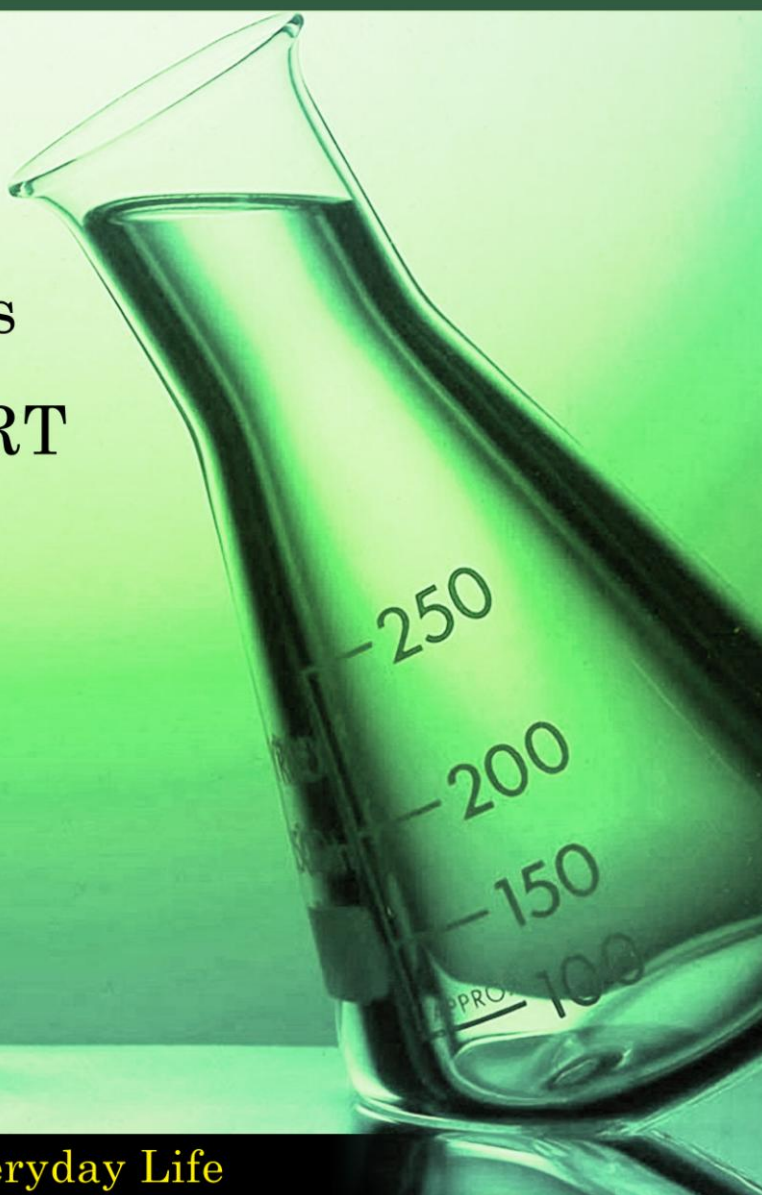




Simplifying Test Prep

CBSE Class
12 th NCERT
Chemistry
Solutions-
Chapter-16
(E BOOK)



Chemistry in Everyday Life

Preface

This e-book is prepared by the CBSE board exam experts of jagranjosh.com, an online educational portal of Dainik Jagran.

The purpose of providing solutions for CBSE class 12th Science and Mathematics NCERT book is to explain the questions in an easy way and as per the CBSE marking scheme. This is a product exclusively for CBSE class 12th students which acts as a time-saver by providing a pattern for the solutions of NCERT based questions as per the CBSE curriculum. This document help to build a strong concept on the chapter mentioned in here and hence the students have been guided in the most appropriate way for their board examination

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Chapter-16

Chemistry in Everyday Life

Class-XII

Subject- Chemistry

16.1 Why do we need to classify drugs in different ways?

Answer 16.1

A drug may be classified by the chemical type of the active ingredient or by the way it is used to treat a particular condition.

Basis of classification are:

➤ **On the basis of molecular targets:**

This category contains drugs which have the same mechanism of action on targets. Hence, it is the most useful to medicinal chemists.

➤ **On the basis of chemical structure:**

This category contains drugs which have common structural features and they also show similar pharmacological activity.

➤ **On the basis of pharmacological effect:**

This category contains drugs which are available for the treatment of a particular type of problem. Thus, such a classification is very useful to doctors.

➤ **On the basis of drug action:**

This classification is based on the action of a drug on a particular biochemical process. This classification is very important.

16.2 Explain the term target molecules or drug targets as used in medicinal chemistry.

Answer 16.2

In medicinal chemistry, target molecules or drug targets are the key molecules which are involved in certain metabolic pathways that result in specific diseases. For Example: Carbohydrates, lipids, proteins and nucleic acid.

16.3 Name the macromolecules that are chosen as drug targets.**Answer 16.3**

Carbohydrates, Lipids, Proteins and Nucleic Acids are chosen as drug targets.

16.4 Why should not medicines be taken without consulting doctors?**Answer 16.4**

Medicine may be toxic for some receptor sites as they can act on more than one receptor site.

They become poisonous, when taken in higher doses than recommended. Thus, medicines should not be taken without consulting doctors.

16.5 Define the term chemotherapy.**Answer 16.5**

Chemotherapy: It is the use of chemicals for therapeutic effect.

For example: Use of chemicals in the diagnosis, prevention, and treatment of diseases.

16.6 Which forces are involved in holding the drugs to the active site of enzymes?**Answer 16.6**

Either of the following forces can be involved in holding drugs to the active sites of enzymes.

- (i) Ionic bonding

- (ii) Dipole – dipole interaction
- (iii) Vander Waals force
- (iv) Hydrogen bonding

16.7 While antacids and antiallergic drugs interfere with the function of histamines, why do these not interfere with the function of each other?

Answer 16.7

Different drugs act on different receptors. For example- Antacids and anti-allergic drugs work on different receptors. Thus, they do not interfere with each other's functions. But they interfere with the functions of histamines because of similar receptors.

16.8 Low level of non-adrenaline is the cause of depression. What types of drugs are needed to cure this problem? Name two drugs.

Answer 16.8

Anti-depressant drugs are used to cure depression. These drugs inhibit the action of enzymes which helps in catalysing the degradation of the neurotransmitter, non-adrenaline. As a result, the important neurotransmitter is slowly metabolised and then it can activate its receptor for longer periods of time.

Examples of anti-depressant drugs are:

- Phenzine
- Iproniazid

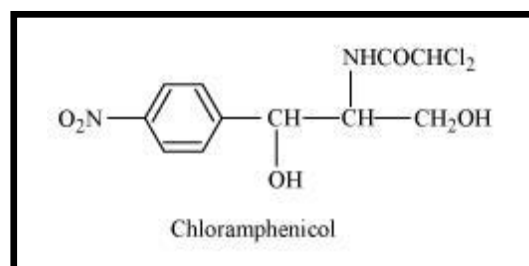
16.9 What is meant by the term 'broad spectrum antibiotics'? Explain.

Answer 16.9

Broad spectrum antibiotics:

These are the antibiotics which are effective against a wide range of gram-positive and gram-negative bacteria.

For example- Chloramphenicol, vancomycin and ofloxacin.



Uses:

- (i) For the treatment of pneumonia, dysentery, typhoid, acute fever, meningitis, etc.
- (ii) Ampicillin and amoxicillin –synthetically modified from penicillin – are also broad spectrum antibiotics.

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

Answer 16.10

| Antiseptics | Disinfectants |
|--|--|
| They are applied to the living tissues such as wounds, cuts, ulcers, and diseased skin surfaces | They are harmful to the living tissues. They are applied to inanimate objects such as floors, drainage system, |
| For example- Iodine, a strong antiseptic. Tincture of iodine (2 – 3 percent of solution of iodine in alcohol – water mixture) is applied to wounds. | For example- 1 percent solution of phenol. |

16.11 Why are cimetidine and ranitidine better antacids than sodium hydrogen carbonate or magnesium or aluminium hydroxide?

Answer 16.11

Antacids such as sodium hydrogen carbonate, magnesium hydroxide, and aluminium hydroxide neutralises the excess hydrochloric acid present in the stomach. But, they don't treat the root cause for the release of excess acid.

Cimetidine and ranitidine are better antacids as they control the main cause of acidity. They prevent the interaction of histamine with the receptors present in the stomach walls. Thus, the amount of acid released by the stomach decreases.

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

Answer 16.12

Phenol can be used as an antiseptic as well as a disinfectant.

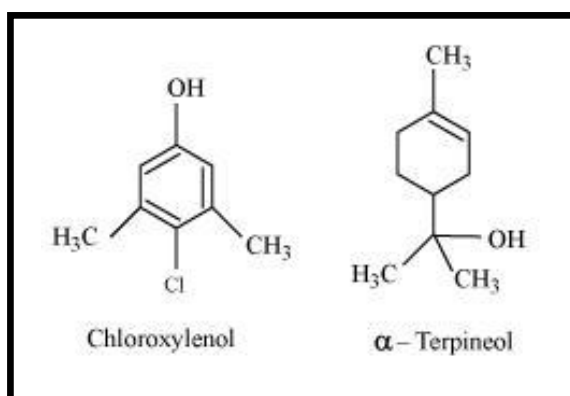
- 0.2 percent solution of phenol is used as an antiseptic.
- 1 per cent of its solution is used as a disinfectant.

16.13 What are the main constituents of dettol?

Answer 16.13

The main constituents of dettol are:

- chloroxylenol and
- α -terpineol



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

Answer 16.14

Tincture of iodine: It is a 2-3 % solution of iodine in alcohol & water mixture.

Use: It is used as an antiseptic on wounds.

16.15 What are food preservatives?**Answer 16.15**

Food preservatives:

The chemicals which are added into food in order to prevent their spoilage by inhibiting microbial growth are known as food preservatives.

For example: Table salt, sugar, sodium benzoate (C_6H_5COONa), vegetable oil, and salts of propanoic acid

16.16 Why is use of aspartame limited to cold foods and drinks?**Answer 16.16**

Aspartame becomes unstable at cooking temperature. Thus, it can be used only at low temperature.

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

Artificial sweetening agents: These are the chemicals which sweeten food. They do not harm the human body. But, they do not add calories to our body as natural sweeteners do. For example: Saccharin, Aspartame, sucralose, and alitame.

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

Artificial sweetening agents can be used in preparing sweets for diabetic patients. For Example- saccharin, alitame, and aspartame

16.19 What problem arises in using alitame as artificial sweetener?**Answer 16.19**

Alitame is a high potential sweetener. When alitame is used as an artificial sweetener, it is difficult to control the sweetness of food. Thus, it is avoided.

16.20 How are synthetic detergents better than soap?**Answer 16.20**

Soaps are not effective in hard water as they work in soft water. On the other hand, synthetic detergents work both in soft water and hard water.

Hence, synthetic detergents are better than soaps.

16.21 Explain the following terms with suitable examples

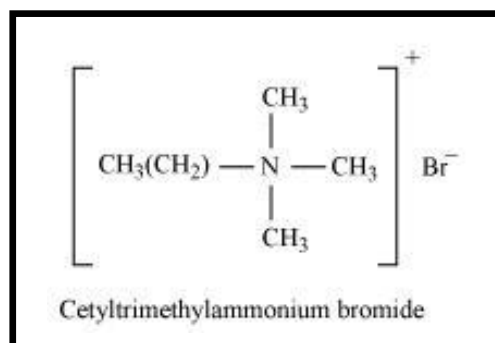
- (i) Cationic detergents
- (ii) Anionic detergents, and
- (iii) Non-ionic detergents

Answer 16.21

- (i) **Cationic detergent:**

These are quaternary ammonium salts of acetates, chlorides, or bromides. The cationic part of these detergents contains a long hydrocarbon chain and a positive charge on the N atom. Thus, they are known as cationic detergents.

For example- cetyltrimethylammonium bromide



(ii) Anionic detergents

Anionic detergents are of two types:

Sodium alkyl sulphates:

These detergents are sodium salts of long chain alcohols. They are prepared by first treating these alcohols with concentrated sulphuric acid and then with sodium hydroxide.

For examples: Sodium lauryl sulphate ($C_{11}H_{23}CH_2OSO_3^-Na^+$), sodium stearyl sulphate ($C_{17}H_{35}CH_2OSO_3^-Na^+$)

Sodium alkylbenzenesulphonates:

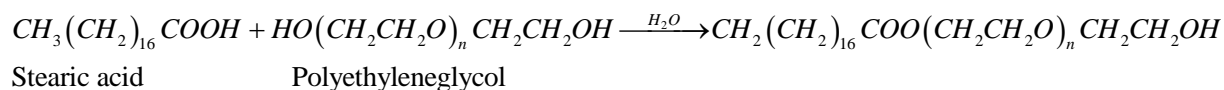
These detergents are sodium salts of long chain alkylbenzenesulphonic acids. They are prepared in 2 steps:

- Friedel-Crafts alkylation of benzene with long chain alkyl halides or alkenes.
- The obtained product is first treated with concentrated sulphuric acid and then with sodium hydroxide.

For Example: Sodium 4-(1-dodecyl) benzenesulphonate (SDS)

(iii) Non-ionic detergents:

They don't contain any ions. These detergents are esters of alcohols having high molecular mass. They are obtained by reacting polyethylene glycol and stearic acid.



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

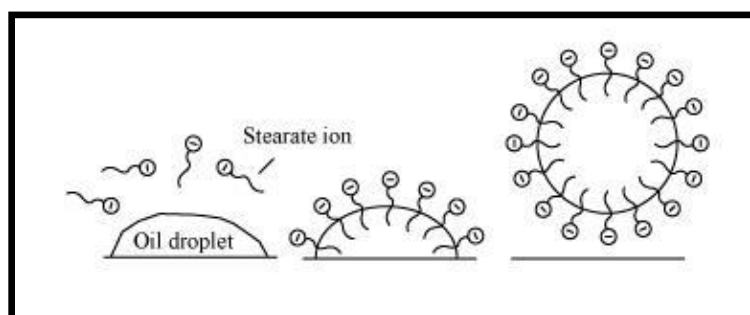
Answer 16.22

16.25 Explain the cleansing action of soaps.**Answer 16.25**

Cleansing action of soaps:

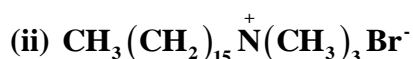
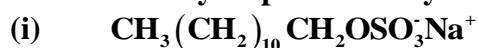
When soaps are dissolved in water, Soap molecules form micelles around an oil droplet/ dirt) in a manner that the hydrophobic parts of the soap ions attach themselves towards the oil droplet and the hydrophilic parts project outside the oil droplet.

Because of polar nature of the hydrophilic parts, soap ions (stearate ions) along with the dirt are washed with water, in turn removing the dirt from the cloth.

**16.26 If water contains dissolved calcium hydrogen carbonate, out of soaps and synthetic detergents which one will you use for cleaning clothes?****Answer 16.26**

Synthetic detergents will be used in this condition for cleaning clothes. As soaps form insoluble salts on dissolving in water containing calcium ions.

On the other hand, when synthetic detergents are dissolved in water containing calcium ions, these ions form soluble salts which act as cleansing agents.

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



Answer 16.27

(i)

$\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2$ – hydrophobic part

$\text{OSO}_3^- \text{Na}^+$ – hydrophilic part

(ii)

$\text{CH}_3(\text{CH}_2)_{15}$ – hydrophobic part

$\text{N}^+(\text{CH}_3)_3 \text{Br}^-$ – hydrophilic part

(iii)

$\text{CH}_3(\text{CH}_2)_{16}$ – hydrophobic part

$\text{COO}(\text{CH}_2\text{CH}_2\text{O})_n\text{CH}_2\text{CH}_2\text{OH}$ – hydrophilic part