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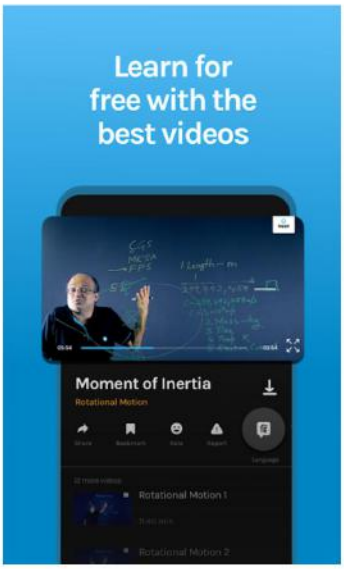

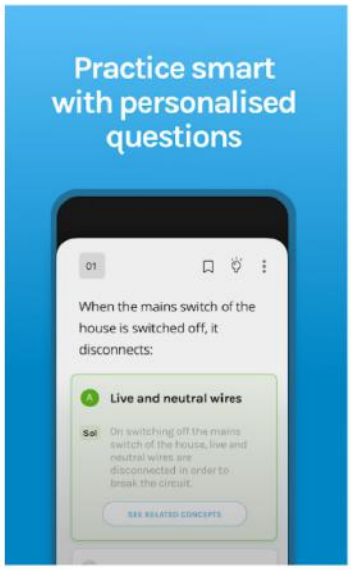

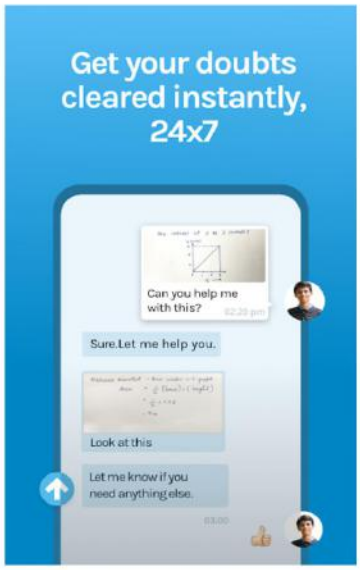

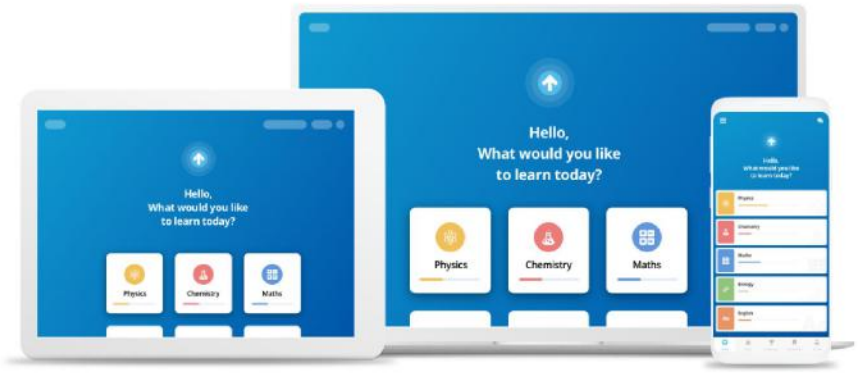

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#453795
Topic: Medicines

Why do we need to classify drugs in different ways ?

Solution

We need to classify drugs in different ways because different types of classification to drugs may be helpful for people belonging to various fields, such as scientists, drug manufactures, students, chemists etc.

Thus, the knowledge of pharmacological effect makes the job of doctors easy. Also, correct medicine can be given as a first aid in case of emergency.

When there is acidity, we can use antacid.

#453796
Topic: Medicines

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

Solution

In medicinal chemistry, target molecules or drug targets refer to the key molecules (such as carbohydrates, proteins, and nucleic acids) that are involved in certain metabolic pathways leading to certain diseases. These target molecules are inhibited when the drug molecules bind to the active sites.

#453797
Topic: Medicines

Name the macromolecules that are chosen as drug targets.

Solution

The macromolecules that are chosen as drug targets includes carbohydrates, proteins, lipids and nucleic acids. In medicinal chemistry, target molecules or drug targets refer to the key molecules that are involved in certain metabolic pathways leading to certain diseases. These target molecules are inhibited when the drug molecules bind to the active sites.

#453798
Topic: Medicines

Why should not medicines be taken without consulting doctors ?

Solution

Drugs have several side effects. Drug overdose may be fatal due to toxicity.

Thus, due to harmful and poisonous nature of a drug, it should not be taken without proper medical advice.

#453799
Topic: Medicines

Define the term chemotherapy.

Solution

Chemotherapy is the use of chemicals for therapeutic effect in diagnosis, prevention and treatment of diseases.

#453801
Topic: Medicines

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

Solution

The forces involved in holding the drugs to the active site of enzymes can be any one of the following:

(i) Ionic bonds

(ii) Hydrogen bonds

(iii) Dipole-dipole interactions

(iv) Van der Waals forces

#453802
Topic: Medicines

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

Solution

Antacids and antiallergic drugs interfere with the function of histamines. However, they do not interfere with the function of each other. This is because, they affect different receptors.

#453803

Topic: Types of drugs

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

Solution

Low level of noradrenaline is the cause of depression. Anti-depressant drugs are needed to cure this problem. They inhibit enzymes that catalyze noradrenaline degradation.

Hence, the metabolism of noradrenaline is slowed down and the neurotransmitter can activate its receptor for longer periods of time.

Iproniazid and phenelzine are two such drugs.

#453804

Topic: Types of drugs

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

Solution

Broad spectrum antibiotics are effective against a wide range of gram-positive and gram-negative bacteria.

Example includes chloramphenicol that can be used for the treatment of typhoid, dysentery, acute fever, pneumonia etc.

Other examples includes vancomycin, ofloxacin, ampicillin and amixicillin.

#453805

Topic: Types of drugs

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

Solution

Antiseptics are applied to the living tissues such as wounds, cuts, ulcers and diseased skin surfaces.

Disinfectants are applied to inanimate objects such as floors, drainage system, instruments etc. They are harmful to living tissues.

Iodine is a strong antiseptic. Tincture of iodine 92-93% of solution of iodine in alcohol-water mixture and 1 percent solution of phenol act as disinfectants.

#453806

Topic: Medicines

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

Solution

Sodium hydrogen carbonate or magnesium or aluminum hydroxide neutralize the excess HCl present in the stomach. They do not treat the root cause for the release of excess acid..

Cimetidine and ranitidine control the root cause of acidity and decrease the amount of acid released by stomach.

Note: Acidity is due to the release of excess acid which in turn is due to the interaction of histamine with receptors in the stomach walls.

#453807

Topic: Types of drugs

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

Solution

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

0.2% solution of phenol is an antiseptic while 1 percent of its solution is a disinfectant.

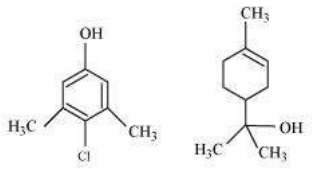
#453809

Topic: Types of drugs

What are the main constituents of dettol ?

Solution

Chloroxylenol and α-terpineol are the main constituents of dettol.



Chloroxylenol

α – Terpineol

#453810
Topic: Types of drugs

What is tincture of iodine? What is its use?

Solution

Tincture of iodine is $2-3$ percent solution of iodine in alcohol-water mixture.

It is an antiseptic and is applied to wounds.

#453811
Topic: Chemicals in food

What are food preservatives ?

Solution

Food preservatives (synthetic or naturally occurring) are added to food (or pharmaceuticals, paints, biological samples, woods etc.) to prevent decomposition by microbial growth or by undesirable chemical changes.

#453812
Topic: Chemicals in food

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

Solution

The use of aspartame is limited to cold foods and drinks as aspartame becomes unstable at cooking temperature.

#453813
Topic: Chemicals in food

What are artificial sweetening agents ? Give two examples.

Solution

Chemicals that sweeten food are called artificial sweetening agents. They do not add calories to our body. They do not harm our body. Examples include aspartame, saccharin sucrolose and alitame.

#453814
Topic: Chemicals in food

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

Solution

Saccharin, alitame and aspartame are the sweetening agents used in the preparation of sweets for a diabetic patient.

#453815
Topic: Chemicals in food

What problem arises in using alitame as artificial sweetener ?

Solution

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

#453816
Topic: Cleansing agents - soaps and detergents

How are synthetic detergents better than soaps ?

Solution

Synthetic detergents are better than soaps as synthetic detergents work in soft water as well as in hard water, whereas soaps work in soft water only.

#453817

Topic: Cleansing agents - soaps and detergents

Explain the following terms with suitable examples.

(i) cationic detergents

(ii) anionic detergents and

(iii) non-ionic detergents.

Solution

(i) Cationic detergents : Quaternary ammonium salts of acetates, chlorides or bromides in which the cationic part has a long hydrocarbon chain and N atom has positive charge are cationic detergents. Example includes cetyltrimethylammonium bromide.

(ii) Anionic detergents: Sodium alkyl sulphates and sodium alkyl benzene sulphonates are anionic detergents.

Examples include sodium lauryl sulphate, sodium stearyl sulphate, sodium 4-(1-dodecyl)benzene sulphonate etc.

(iii) Non-ionic detergents: They do not contain ions. They are esters of alcohols with high molecular mass.

They can be prepared by the reaction between stearic acid and polyethylene glycol.

#453820

Topic: Cleansing agents - soaps and detergents

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

Solution

Biodegradable detergents can be degraded by bacteria. They have straight hydrocarbon chain. Example includes sodium lauryl sulphate.

Non-biodegradable detergents cannot be degraded by bacteria. They have highly branched hydrocarbon chains. Example includes

$sodium-4-(1,3,5,7-tetramethyloctyl)benzene\ sulphonate$

#453821

Topic: Cleansing agents - soaps and detergents

Why do soaps not work in hard water ?

Solution

Soaps do not work in hard water due to formation of insoluble calcium or magnesium slats of fatty acids.

Soaps are sodium or potassium salts of long chain fatty acids. Hard water contains calcium and magnesium ions.

During dissolution of soap in hard water, calcium and magnesium ions displace sodium or potassium ions from soaps to form insoluble calcium or magnesium salts.

#453822

Topic: Cleansing agents - soaps and detergents

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

Solution

We can use soaps but not synthetic detergents to check the hardness of water.

Synthetic detergents do not get precipitated either in hard water or in soft water.

Soaps work in soft water. They do not work in hard water due to formation of insoluble calcium or magnesium salts of fatty acids.

Soaps are sodium or potassium salts of long chain fatty acids. Hard water contains calcium and magnesium ions.

During dissolution of soap in hard water, calcium and magnesium ions displace sodium or potassium ions from soaps to form insoluble calcium or magnesium salts.

Hence, soaps can be used to check the hardness of water.

#453823

Topic: Cleansing agents - soaps and detergents

Explain the cleansing action of soaps.

Solution

Polar end (end with sodium or potassium ion) of soap is hydrophilic (attracted towards water) and the non polar end (the hydrocarbon part) is hydrophobic (attracted towards hydrocarbons).

On dissolution in water, the hydrophobic ends attach themselves to dirt and remove it from the cloth.

Soap molecules form micelle and trap the dirt at the center of the cluster. They remain suspended in water like particles of colloidal solution. The trapped dust particles are easily rinsed away with water.

#453825

Topic: Cleansing agents - soaps and detergents

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

Solution

If water contains dissolved calcium hydrogen carbonate, we will use synthetic detergents for cleaning clothes.

Synthetic detergents do not get precipitated either in hard water or in soft water.

Soaps work in soft water. They do not work in hard water due to formation of insoluble calcium or magnesium slats of fatty acids.

Soaps are sodium or potassium salts of long chain fatty acids. Hard water contains calcium and magnesium ions.

During dissolution of soap in hard water, calcium and magnesium ions displace sodium or potassium ions from soaps to form insoluble calcium or magnesium salts.

#453827

Topic: Cleansing agents - soaps and detergents

Label the hydrophilic and hydrophobic parts in the following compounds.

(i) $CH_3(CH_2)_{10}CH_2O\overline{SO_3}\overset{+}{N}a$

(ii) $CH_3(CH_2)_{15}\overset{+}{N}(CH_3)_3\overline{Br}$

(iii) $CH_3(CH_2)_{16}COO(CH_2CH_2O)_nCH_2CH_2OH$

Solution

The hydrophilic and hydrophobic parts in the following compounds are as shown.

$\underbrace{CH_3(CH_2)_{10}CH_2}_{hydrophobic\ part}\ \underbrace{O\bar{S}O_3\overset{+}{N}a}_{hydrophilic\ apart}$

$\underbrace{CH_3(CH_2)_{15}}_{hydrophobic\ part}\underbrace{\overset{+}{N}(CH_3)_3\bar{B}r}_{hydrophilic\ part}$

$\underbrace{CH_3(CH_2)_{16}}_{hydrophobic\ part}\underbrace{COO(CH_2CH_2O)_nCH_2CH_2OH}_{hydrophilic\ part}$

#457626

Topic: Cleansing agents - soaps and detergents

Action of soap is due to emulsification and micelle formation. Comment.

Solution

Soap molecules have two parts, on is polar head which is hydrophilic (water soluble) carboxylate group and other is non polar tail, which is hydrophobic (oil soluble) hydrocarb tail. In water, several soap molecules aggregate to form micelles in which hydrocarbon tails are in the interior of cluster and polar heads are at the surface of clusters. The dirt i cloth is due to presence of dust particles in fat or grease which stick to the cloth. In the soap solution, micelles are formed around oil droplets. The hydrophobic part of soap is in the oil droplet and hydrophilic part projects outside like bristiles. The oil drops and micelle are then pulled in water due to hand rubbing or agitation and are washed away.