16. Chemistry In Everyday Life

16.1 INTRODUCTION

Organic compounds play an important role in our daily life.The clothes that we used may be cotton or synthetic fibres all are organic in character. The food that we eat is a mixture of organic compounds. The cosmetics, soaps, perfumes, plastics, explosive, rubber, paper, dyes, drugs, etc. are all organic compounds.

16.2 CHEMICALS IN MEDICINE AND HEALTH CARE

The chemical substances used in treatment of diseases and pain are known as drugs. The word drugs come from french word. 'drogue' making a dry herb.

The ideal drug is one which should not disturb physiological process but destroys invading (unwanted) organism without affecting the tissue of hosts.This tratment is known as chemotherapy and chemicals used in chemotherapy are known as chemotherapeutic agents.

The term chemotherapy is given by Paul Ehrlich in 1910. He was a father of chemotherapy, he introduced the first chemotherapeutic agent organo arsenic compound against syphilis.

The important groups of medicine compounds are mentioned below.

i) Analgesics
ii) Antipyretic
iii) Tranquilizers and hypnotic
iv) Antiseptics and disinfectants
v) Antibiotics
vi) Antacids
vii) Food preservatives
viii) Sweetening agents
ix) Antioxidants
x) Sedatives

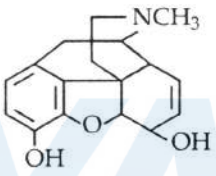
16.3 ANALGESIC (PAIN KILLER)

Definition: These are the chemical substances used for relieving pain by acting on central nerve system without distrubing the nerves system is known as analgesic.

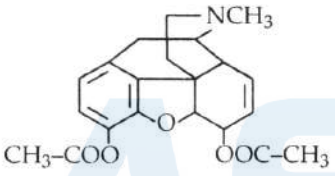
These are two types narcotics and non narcotics.

1. Narcotics analgesic:

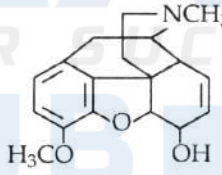
These are the chemical substances obtained from natural source and produce sleep and have sedative action (unconsciousness). These are mostly opium products (alkaloids) and mostly attack on central nerve system and produces euphoria. These are used in severe pain. e.g. Codein, morphine, heroin. However alkaloids are habit forming hence should not be taken without advice of doctor. Heroin is a diactyl derivetives of morphine and has more tendency for addiction. Codein is less potent analgesic than morhpine.



Morphine ($C_{17}H_{19}NO_3$)



Heroin (morphine diacetate) ($C_{21}H_{23}NO_5$)



Codeine ($C_{18}H_{21}NO_3$)

2. Non narcotics analgesic:

These are not potent and do not form addiction. They give immediate relief from pain and fever. These are non steroidal anti inflammatory drug (NSAID). e.g. Aspirin, brufen, naproxen, methyl salicylate, paracetamol etc.

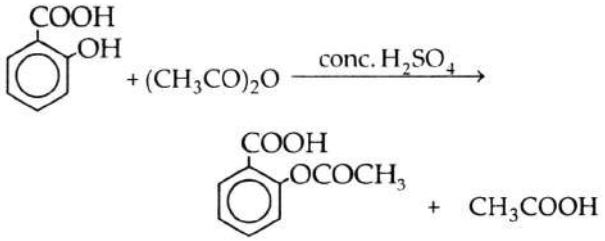
Aspirin - (Acetyl salicylic acid, 2-acetoxybenzoic acid) :

It is a first analgesic discovered by German chemist Felix Hoffmann in 1899.

Preparation from acetylation of salicylic acid:

When salicylic acid is heated with acetic anhydride or acetyl chloride in the presence of small amount of conc. H_2SO_4 or sodium acetate

or glacial acetic acid or pyridine or phosphoric acid to give aspirin.



Uses and side effect of aspirin :

Uses: Analgesic (headache, joint pain, toothaches, dental pain, neuralgias), antipyretic, arthritis, alzheirmers disease (thrembling of limbs), cancer pain, prevention of heart attack due to it has antiblood clotting action.

Side effects: Nausea, vomiting, epigastric distress, blood loss in stools, dizziness, tinnitus, fatigue etc.

16.4 ANTIPYRETICS

The chemical substances used to reduce body temperature in high fever. e.g. Aspirin, paracetamol.

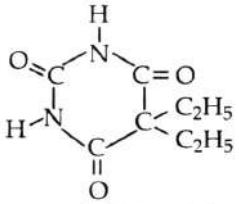
16.5 TRANQUILIZERS (PSYCHOTHERAPEUTIC DRUGS)

Definition: The chemical substances used for mental disease, stress, anxiety by acting on central nerves system are known as tranquilizers.

Working : Noradrenaline is one of the neurotransmitters that play role in mood changes. If the level of noradrenaline is low for some reason, then signal sending become low and person suffers from depression. In such situation antidepressant drugs are required, which balance the level of noradrenaline e.g. Iproniazid, phenelzine.

Hypnotic tranquilizers :

Definition: The chemical substances used for mental disease, stress ,anxiety and produces sleep. The most commonly used sleep producing tranquilizers are barbiturates. It includes barbituric acids and its derivatives.

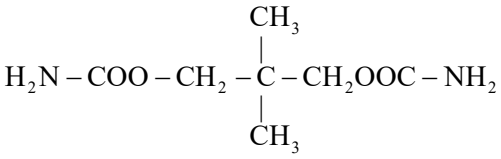


Veronal($C_8H_{12}N_2O_3$)

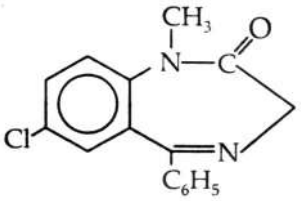
Non hypnotic tranquilizers:

Definition: The chemical substances used for mental diseases and stress but does not produces sleep.

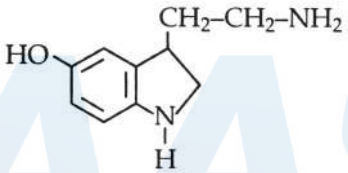
In addition to barbiturates a large number of non hypnotic tranquilizers are known such as equanil, valium. These are suitable for relieving tension but does not produces sleep.



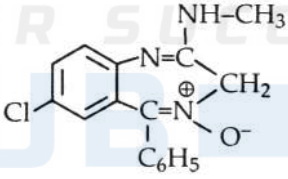
Equanil ($C_7H_{14}N_2O_4$)



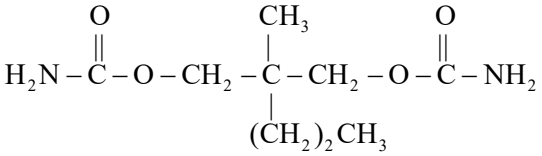
Valium ($C_{16}H_{13}ClN_2O$)



Serotonin ($C_{10}H_{12}N_2O$)

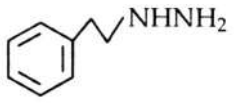


Chlordiazepoxide ($C_{16}H_{14}N_3OCl$)



Meprobamate ($C_9H_{15}N_2O_4$)

Iproniazid ($C_9H_{13}N_3O$)



Phenelzine (Nardil) ($C_8H_{12}N_2$)

Uses and side effect of tranquilizers:

Uses:

i) As hypnotic: To control mania, delirium, seizures, alcohol withdrawing muscles spam.

ii) As a sedative (sleep producing) in psychosomatic disorder.

iii) Anti convulsant for emergency control of convulsions.

iv) They reduce mental tension.

vii) They reduce anxiety, demensia.

viii) They are able to reduce agitation and disturbed behaviour in schizophrenia.

ix) To produce emotional calmness.

x) To make patient passive and control their depression.

xi) They restore confidence in the patients.

xii) They give relief from insomnia (restlessness and emotional tension).

16.6 ANTACIDS

Definition: The chemical substances which neutralize enough acid in gastric juice and give relief from indigestion, acidity, heart burn and gastric ulcer are known as antacids.

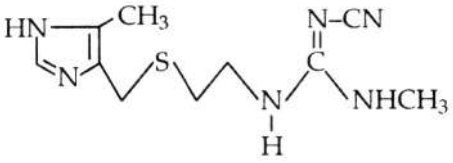
The chemical histamine stimulate secretion of pepsin and HCl in stomach. The drug cimetidine (tegamet) is prevent the interaction of histamine with the receptor present in the stomach wall. This resulted in release of lesser amount of acid.

Some common antacids are:

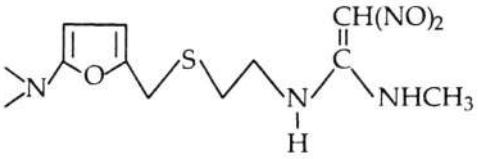
1. Aluminium hydroxide gel ($Al(OH)_2$)
2. Magnesium hydroxide (milk of magnesia) $Mg(OH)_2$
3. Sodium bicarbonate ($NaHCO_3$)

Note: $NaHCO_3$, $Mg(OH)_2$, $Al(OH)_3$ does not reduce the secretion of acid in stomach they only neutralise HCl formed in stomach, hence these are not better antacid than rantidine(zinetac), cimitidine (tegamet) etc.

Histamine($C_5H_9N_3$)



Cimetidine (Tegamet)($C_{10}H_{14}N_4S$)



Ranitidine (Zinetac) ($C_{13}H_{22}N_4O_3S$)

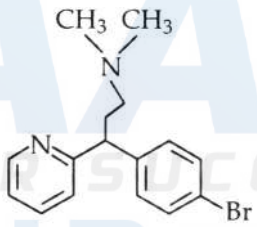
16.7 ANTIHISTAMINES (ANTIALLERGIC DRUGS)

Mechanism of allergy: Number of different sensitising substances (called antigens) derived from food or environment may cause allergic reaction in human. This is due to release of chemical substances called histamine in the body. Histamine in stomach stimulate the secretion of HCl and pepsin.

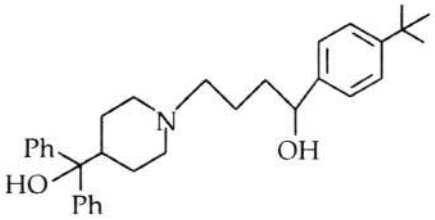
Definition: These are chemical substances which diminish or abolish, the main action of histamine released in body and hence prevent the allergic action.

It may be noted that antihistamine not affect the secretion of acid in stomach. The reason is that antacid and antiallergic drugs work on different receptors.

e.g.



Bromopheneramine (dimetapp, dimetane) ($C_{16}H_{19}BrN_2$)



Terfenadine (seldane) ($C_{32}H_{41}NO_2$)

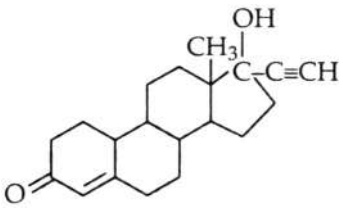
16.8 ANTIFERTILITY (PHEROMONE OR ORAL CONTRACEPTIVE PILLS)

Definition: Chemical substances which control the pregnancy are known as antifertility.

Birth control pills are steroids containing a mixture of synthetic estrogen and progesterone hormones.

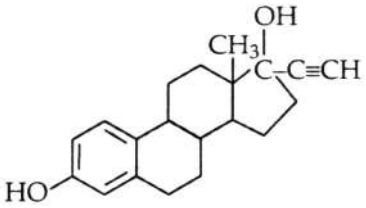
It is known that progesterone hormones suppress the ovulation.

e.g.



Norethindrone is a synthetic progesterone.

$(C_{29}H_{36}O_2)$



Ethynyl estradiol (Novestrol) $(C_{29}H_{34}O_2)$

16.9 ANTIMICROBIALS

Diseases in living organism may be caused by various microbes such as bacteria, virus, fungi and other pathogens.

The chemical substances which kill the microbes or prevent the growth of microbes are known as antimicrobials.

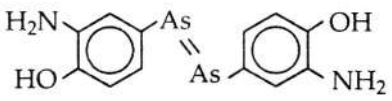
e.g. Antibacterial drugs, antiviral drugs, antifungal drugs, antiparasitic drugs selectively antibiotics, antiseptics, disinfectants are antimicrobial drugs.

16.9.1 ANTIBIOTICS (ANTIBACTERIAL)

Antibiotic is a word derived from antibiosis means survival of fittest.

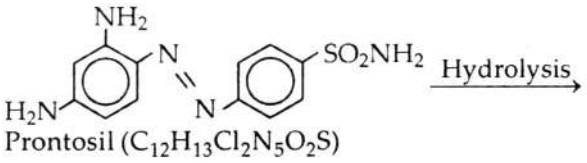
Definition: The chemical substances which are produced from microorganism (bacteria, fungi, moulds) or produced by chemical synthesis and can kill the other microorganism or control (inhibit) the growth of other microorganisms.

Paul Ehrlich developed a drug on syphilis i.e. arsphenamine or salvarsan. In 1932 Paul Ehrlich prepare effective antibacterial agent prontosil, which has similar structure to the compound salvarsan.

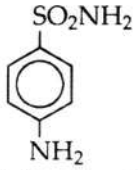


Salvarsan $(C_{12}H_{12}As_2N_2O_2)$

It was then found that in body prontosil is converted in to sulphanilamide which has antibiotic property.

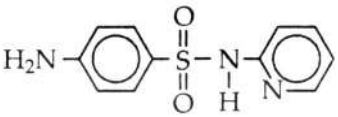


Prontosil $(C_{12}H_{13}Cl_2N_5O_2S)$



Sulphanilamide

The sulpha drug is sulphapyridine which is most effective drug.



Sulphapyridine $(C_{11}H_{11}N_3O_2S)$

The complete range of microorganism attacked by antibiotics is known as its spectrum.

Thus antibiotics are two types.

Broad spectrum antibiotics and narrow spectrum antibiotics.

1. Broad spectrum antibiotics:

The antibiotics which are able to kill all harmful microorganism or control the growth of all harmful microorganisms (gram positive and gram negative bacteria) are known as board spectrum antibiotics.

e.g.Chloramphenicol, tetracycline, of laxacinll ampicillin, amoxycillin, erythromycin, aminoglycosides etc. Narrow spectrum antibiotics:

2. Narrow spectrum antibiotics

The antibiotics which kill or prevent the growth of specific micro organisms are known as narrow spectrum antibiotics. e.g. Penicillin.

Depending upon mode of action antibiotics are divided into two type,

1. Bactericidal antibiotics:

The antibiotics which kill the bacteria (microorganism) are known as bactericidal.

e.g. Penicillin, aminoglycosides, oflaxacin, streptomycin (high concentration).

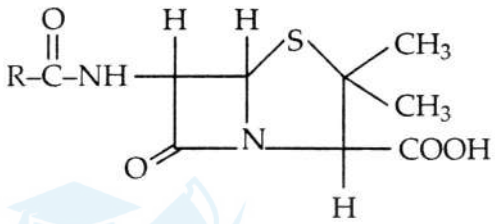
2. Bacteristatic antibiotics:

The antibiotics does not kill the bacteria but control the growth of bacteria are known as bacteristatic e.g. Erythromycin, tetracyclines, chloramphenicol, streptomycin (low concentration).

Bactericidal antibiotics:

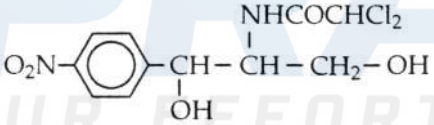
Penicillins: It is first antibiotics discovered by **Alexanders Fleming** in 1929. It is obtained from moulds penicillium notatum. The penicillins are the most widely" effective antibiotics and are among the least toxic drug.

Some synthetic penicillin are ampicillin, amoxycillin.



Penicillin R = $C_9H_{11}O_4SN_2$

Chloramphenicol: It is isolated in 1947. It is rapidly absorbed from the gastrointestinal tract hence can be given orally in case of typhoid fever, dysentery, tuberculosis, meningitis,pneumonia.



Chloramphenicol ($C_{11}H_{12}C_{12}N_2O_5$)

16.9.2 ANTISEPTICS

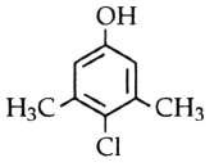
The Greek word septikas is origin of word septic. Septikas means process of rottening or putrifying.

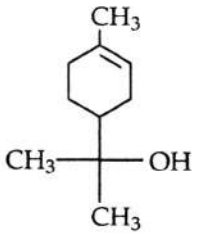
Definition: The chemical substances which are used to kill or prevent the growth of microorganism and can be applied on diseased skin surface area are known as antiseptics.

Uses:

i) **Phenol**- 0.2% Solution of phenol and its derivatives are used as antiseptic e.g. amyl metacresol, salol.

ii) **Dettol** - It is a mixture of chloroxylenol and terpineol in a suitable solvent. Used as antiseptic in liquid form as a after shave, wounds, ulcer etc.





Chloroxylenol (C_5H_9C1O) Terpineol ($C_{10}H_{18}O$)

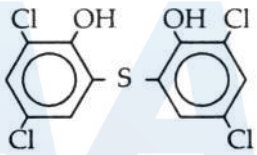
iii) **Iodine** - It is used as a tincture of iodine which is 2 to 3% iodine solution of alcohol-water.

iv) **Iodoform** - It is antiseptic powder for wounds. It's antiseptic property is due to libration of free iodine when exposed to air.

v) **Boric acid** - Dilute solution of boric acid is used as a weak antiseptic for eyes. It is used in baby talcum powder.

vi) **Hydrogen peroxide (Perhydrol)** - It is a nonirritating mild antiseptic used for washing wounds, teeth, ear, developers to dye hair. It is used to remove slough and pus from wounds.

vii) **Bithional**- It is added in soap to reduce body smell.



Bithional ($C_{12}H_6C_{14}O_2S$)

16.9.3 DISINFECTANTS

Definition: The chemical substances which are used to kill microorganism, but they cannot applied on living tissue are known as disinfectants.

They play major role in water treatment and public health care and applied floors, drainage, sanitary fitting etc. e.g. Chlorine, phenol, sulphur dioxide.

Uses :

i) **Chlorine:** It is used in water purification at concentration 0.2 to 0.4 ppm.

ii) **Phenol:** 1% solution of phenol and its derivative are used as disinfectants. e.g. thymol. (It is powerful disinfectants than phenol.)

iii) **Sulphur dioxide:** High concentration of SO_2 is used as disinfectants. While low concentration is used for preservation.

16.10 CHEMICALS IN FOOD PRESERVATIVE

Definition: The chemical substances which are added to food material to prevent their spoilage and to retain their nutritive value for long time are known as food preservatives.

A] Physical methods :

1. By removal of heat (By use of low temperature or freezing) :

Low temperature at freezing point of water is used to prevent growth and activity of microorganism. This process neither kill microbes nor stop the growth of microbes completely. Deep freezing below 255 K stop almost all spoilage process.

Commonly used techniques are refrigeration, cold storage, ice packing, chilling, freezing. e.g. meat, fruits, fishes, beef, eggs are preserved by this method.

2. By addition of heat:

The temperature at boiling point of water is necessary to kill microorganism. The heat treatment varies with the kind of microorganisms, its state and the environment during heating.

The killing of microorganism by heat is supposed to be caused by denaturation of the proteins and especially by the inactivation of the enzymes required for metabolism.

e.g. Cooking, canning and bottling, pasteurization.

3. By removal of water (drying or dehydration):

Drying means the removal of water, or any method that reduce the amount of moisture in food and control the growth of microorganism. Moisture is removed from food by sun drying or mechanical dryers.

Sun drying or solar drying is most economical but it is depends up on the climates. e.g. Fruits, grains, fishes, meat are spread on floor up to sun drying.

4. Irradiation (Cold sterlisation) :

Definition: Killing of microorganism by using radiations (without the use of high temperature and low temperature) is known as irradiation.

Commonly β-rays, γ-rays, ultraviolet radiation and ionising radiation are used for irradiation.

B] Chemical methods (Curing):

The chemicals added in food, to prevent the growth of microorganisms is known as curing.

1. By adding vinegar:

Vinegar contains 6 to 10 % acetic acid, used for food preservation. The presence of vinegar reduce the pH to a level (2.5 to 4) which prevent the growth of unwanted microorganisms.

2. By addition of salt:

Sodium chloride lower the available water for the growth of microorganism and thus have adverse effect on microorganism. It is used in brine (aqueous saturated solution of NaCl 15 to 18 %) or apply directly to food.

e.g. Fishes, lemon pickle, chilli pickles preserved by salt (brine).

3. By addition of sugars:

Sugars more than 68 % such as sucrose is added to lower the available water for the growth of microorganism and thus have adverse effect on microorganisms.

e.g. Sirups, jellies, jams, candies are preserved by sugars.

4. By addition of other chemicals:

Some chemicals are used for the preservation of food.

i) Sodium benzoate commonly used in preservation, which is used to kill microorganism. It's antimicrobial activity at pH 2.5 to 4.

ii) Salt of sorbic acid (sorb ate) and propionic acid (propionate),boric acid.

16.11 ARTIFICIAL SWEETENING AGENTS

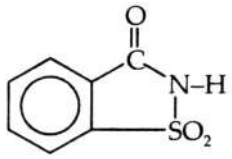
Definition: The chemical substances which donot occur in nature but prepared in laborotary haveing sweet taste, do not have food value are known as artificial sweetening agents.

The artificial sweetening agents do not undergoes the biological reaction in the body. In other word they pass through the human body without producing any calories (unmetabolized).

Therefore artificial sweetening agents are known as low calorie or calorie free sweeteners or substitute of sugar. e.g.

1. Saccharin:

It is discovered by Era Ramson in 1879. It is stable under cold condition and high temperature.



Saccharin ($C_7H_5NSO_3$)

Application: It has very sweet taste is about 550 time more sweeter than sucrose, one gram of saccharin as approximately same sweetening power as 550 gm sucrose.

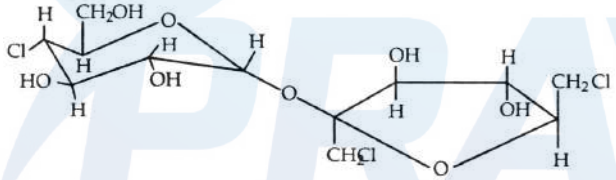
i) It is used in cold foods, soft drinks, baked foods, chewing gums, canned foods, candy, jams, confe ctionery, medicinal syrups, chewing gums, dessert topping, salad dressing, to reduce dental cavities.

ii) It is used in diabetic person instead of sugar.

iii) It is also used in cosmetic products, vitamins, tooth paste.

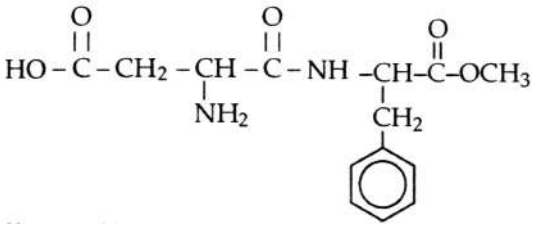
2. Sucrulose ($C_{12}H_{19}CI_3O_8$):

It is trichloro derivatives of sucrose, 600 times sweeter than sucrose. It is unstable in cold condition and at high temperature hence it is not used in cooking.



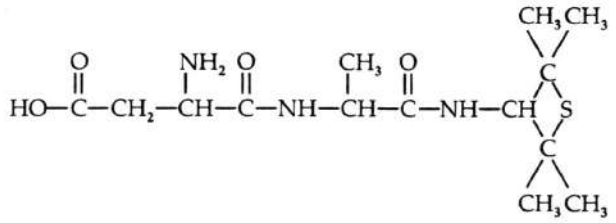
3. Aspartame (methyl ester of dipeptide aspartyl phenyl alanine) ($C_{14}H_{18}N_2O_5$):

It is 100 times sweeter than sucrose. It is used in cold foods. It is stable in only cold condition and unstable at high temperature.



4. Alitame ($C_{14}H_{25}N_3O_4S$):

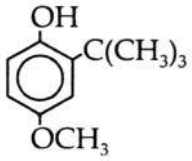
It is 2000 time sweeter than sugar.lt is stable at only high temperature and unstable in cold condition.



16.12 ANTIOXIDANTS

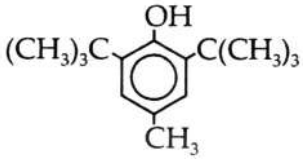
Definition: The chemical substances which prevents the oxidation or polymerisation of free radicals or action of free radicals in food are known as antioxidants.e.g.

i) Butylated parahydroxy anisole (BHA) . ($C_{11}H_{16}O_2$)



2-(2-methyl 2-propyl) 4-methoxy phenol

ii) Butylated parahydroxy toluene (BHT) ($C_{15}H_{24}O$)



2, 6-di (2-methyl 2-propyl) 4-methyl phenol

The free radical formed in food reacts with BHT or BHA to form BHT or BHA free radical. It is more stable because of electron cloud of benzene ring. The BHA or BHT free radical donot reacts with food and thus chain reaction stop. It prevent oxidative rancidity of fats.

Uses of BHA and BHT :

1. The addition of BHA to butter increase its storage life from month to year.
2. BHT is used to control the polymerization of organic peroxide.
3. They are used to avoid rancidity of oil and fats and also used to preserve meat products, flavours, vitamins, potatoes, cereals, cosmetics, pharmaceutical products.

iii) Sulphur dioxide (SO_2), sodium or potassium salt of sulphites (Na_2SO_3) and bisulphites ($NaHSO_3$).

Uses of SO_2, sodium or potassium salt of sulphite and bisulphites :

1. They are used as food additives.
2. They are active as anti-microbial agents,structure modiers,enzymes inhibitors.
3. They are used in wine, fruit juices,pickles.

16.13 CLEANSING AGENTS

These are two types of cleansing agents - (a) Soaps (b) Synthetic detergent

a) Soaps:

Soap are sodium or potassium salt of long chain higher fatty acids which contain more than 12 carbon atoms. It is available in form of cake, liquid ,creams etc Potassium soaps are softer than sodium soaps. Potassium soaps are used in shampoo, shaving creamsand bathing soaps. Sodium soaps are toilet soap used as washing purpose.

Preparation of soap (saponification of triglyceride): Triglycerides are heated with aq. NaOH or KOH gives soap and glycerol is known as saponification.

In this reaction esters of fatty acids are hydrolysed and soap obtained in colloidal form. It is precipitated from the solution by adding NaCl. The solution left after removing the soap contains glycerol, which can be removed by fractional distillation. Only R-COONa and R-COOK are water soluble and used as cleansing agent.

$$\begin{array}{l} CH_2-OOCR \\ | \\ CH-OOCR \\ | \\ CH_2-OOCR \end{array} + 3NaOH \xrightarrow[aq.]{} \underset{\text{soap}}{3RCOONa} + \begin{array}{l} CH_2OH \\ | \\ CHOH \\ | \\ CH_2OH \end{array}$$

It is also prepared by direct neutralisation of higher fatty acids by NaOH or Na_2CO_3

$$R\text{-}COOH + NaOH \longrightarrow R\text{-}COONa + H_2O$$

Limitation of Soap : Soap are insoluble in hard water hence it can not be used in hard water. Hard water contain metal ion such as Ca^{2+} and Mg^{2+}. These two ions react with soap to form curdy white precipitate of calcium and magnesium salt.

$$\underset{\text{soap}}{2R\text{-}COONa} + Ca^{2+} \rightarrow \underset{\text{insoluble}}{(R\text{-}COO)_2\ Ca} + 2Na$$

$$\underset{\text{soap}}{2R\text{-}COONa} + Mg^{2+} \rightarrow \underset{\text{insoluble}}{(R\text{-}COO)_2\ Mg} + 2Na$$

These precipitate stick to the cloth and blocks the ability of soap to remove oils, grease from fabrics. To overcome this difficulty synthetic detergent can be prepared.

b) Synthetic detergents (Soapless Soap) :

These are soapless soap soluble in hard as well as soft water, can form foam in soft and hard water and remove oils, grease dust particals from fabrics are called detergents.

Classification of detergents: These are classified in to three types depending upon nature of surface of active group.

1. Anionic detergents:

Anionic detergents are long chain alcohols or hydrocarbons. The long chain alcohols or hydrocarbons are treated with conc. H_2SO_4 to form alkyl hydrogen sulphate of high molecular mass, which is neutralised with alkali to form salt.

e.g. i) $CH_3–(CH_2)_{10}–CH_2–OH + H\cdot OSO_3H$

Lauryl alcohol

$$\xrightarrow{-H_2O} CH_3–(CH_2)_{10}–CH_2OSO_3H$$

Lauryl hydrogen sulphate

$$\xrightarrow{NaOH} CH_3–(CH_2)_{10}–CH_2–OSO_3^-\ Na^+ + H_2O$$

sodium lauryl sulphate (anionic detergent)

ii) $CH_3-(CH_2)_{11}$–C$_6$H$_4$– $+ H_2SO_4 \xrightarrow{-H_2O}$

Dodecyl benzene

$$CH_3–(CH_2)_{11}–C_6H_4–SO_3H$$

Dodecyl benzene sulphonic acid

$$\xrightarrow{NaOH} CH_3–(CH_2)_{11}–C_6H_4–SO_3^-Na^+ + H_2O$$

sodium dodecyl benzene sulphonate

In anionic detergent, the anionic (–ve) part of molecule is hydrophilic and involved in cleansing action.

These are mostly used for household work, in tooth paste.

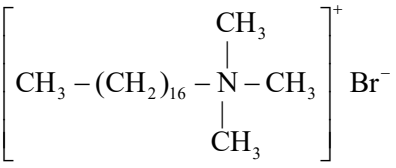
2. Cationic detergents:

Cationic detergents are quaternary ammonium salt of amines with acetate, chloride or bromide.

e.g. $\left[CH_3-(CH_2)_{15}-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{N}}}}-CH_3 \right]^+ Cl^-$

Cetyl trimethyl ammonium chloride or

n-hexadecyl trimethyl ammonium chloride



Stearyl trimethyl ammonium bromide

n-heptadecyl trimethyl ammonium bromide

In cationic detergent, the cationic f+ve) part of molecule is hydrophilic and involved in cleansing action. They have germicidal property and used in hair conditioners.

3. Neutral or nonionic detergents:

These "detergents are nonionic like esters of high molecular mass. They contains polar group, which can form hydrogen bond with water and involved in cleansing action. Thes detergents are either monoester of polyhydric alcohol or polyethers derived from ethylene oxide.

e.g. **i) Polyethylene glycol stearate:**

$R–CH_2–(O–CH_2–CH_2)_n–OH$ Polyether

R= Chain of 11–17 carbon atoms. n = 8–12

Preparation of polyethylene glycol stearate: It is prepared from thylene glycol and stearic acid.

Step-i : It is prepared from ethylene gtycol and ethylene oxide.

$$HO–CH_2–CH_2–OH + n \underset{\backslash\ /}{CH_2 - CH_2 \atop O}$$

ethylene glycol

$$\longrightarrow HO–(CH_2 – CH_2 – O)_n\ CH_2 – CH_2 - OH$$

polyethylene glycol

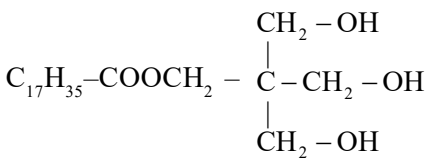
Step- ii : Polyethylene glycol is reacted with stearic acid to give non ionic detergent.

$CH_3–(CH_2)_{16}COOH + HO–(CH_2–CH_2–O)_n–CH_2–CH_2–OH$

$\xrightarrow{-H_2O}$ $CH_3–(CH_2)_{16}COO(CH_2–CH_2–O)_n–CH_2–CH_2–OH$

Polyethylene glycol stearate

ii) Penta eryl thritol monostearate or penta eryl thrityl stearate.

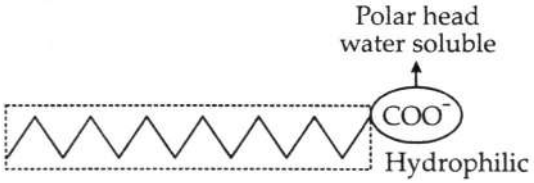


Liquid washing detergents are cationic, anionic, nonionic type, cleansing action is similar to that of soaps. These also remove oils, fats, grease by micelle formation.

Mechanism of cleansing action of soap and detergent:

Soap and detergent have same mechanism.

A molecule of soap has two parts. The long chain hydrocarbon part(tail) soluble in oil and other part (head) soluble in water.



Hydrocarbon hydrophobic

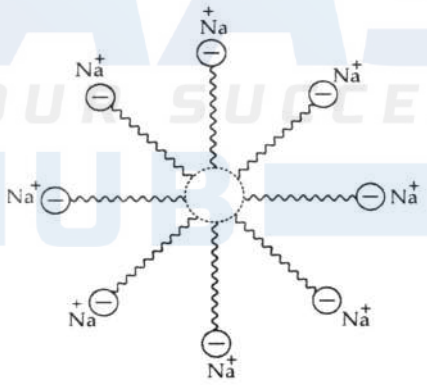
(non-polar tail, oil soluble hydrocarbon)

Micelle formation :

When soap like sodium stearate dissolved in water in high concentration to form micelle which is emulsified associated collidal solution.

$C_{17}H_{35}COONa \rightleftharpoons C_{17}H_{35}COO^- + Na^+$

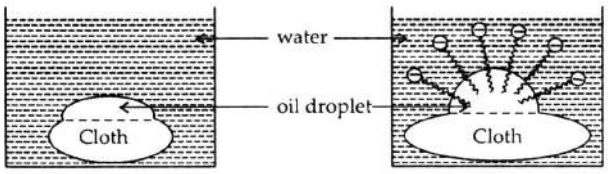
sodium stearate (soap) Stearate ion



Stearic ions associate with ionic micelles in water

Cleansing action:

When cloth with oil droplet dipped in soap solution, the soap molecules forms micelle around the grease or oil droplet in such a way that, the hydrophobic part (nonpolar part) of soap is inside the oil droplet and hydrophilic part (polar part) outside the oil droplet like the bristles. The non polar group which is present inside the oil droplet pulled water inside and removed from surface of fabrics.



Cloth with oil droplet — Micelle formed by adding soap

Biodegradable and non-biodegradable detergent:

a) Biodegradable detergent: The detergent which are easily decomposed in environment by the action of bacteria and does not causes environmental pollution,Stearyl trim ethyl ammonium bromide e.g. Sodium lauryl sulphate, sodium dodecyl benzene sulphonate, cetyl trimethyl ammonium chloride, stearyl trimethyl ammonium bromide.

b) Non-biodegradable detergent: The detergent which are not decomposed in environment and causes environmental pollution.

e.g. Highly branched detergent like polyethylene glycol.

❍❍❍

MULTIPLE CHOICE QUESTIONS

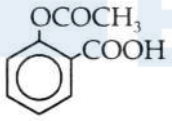
INTRODUCTION, CLASSIFICATION

1. First chemotherapeutic agent is
   a) analgin
   b) organo arsenic compound
   c) salol
   d) dichlophenac sodium
2. Arsenic drugs are mainly used for the treatment of
   a) jaundice b) typhoid
   c) syphillis d) T.B.
3. Chemotherapeatic agents
   a) used in plant preservation
   b) used to kill microbes in plants
   c) used as antioxidant
   d) used to kill microbes in animals
4. The word drug is derived from
   a) Diagnosis b) Dry ice
   c) Drogue d) Dyes

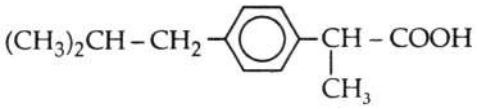
ANALGESIC AND ANTIPYRATICS

5. Aspirin is
   a) barbituric acid b) acetyl salicylic acid
   c) chloroxylenol d) seconal
6. Aspirin is prepared by
   a) alkoxylation of salicylic acid
   b) oxidation of salicylic acid
   c) acetylation of salicylic acid
   d) reduction of salicylic acid
7. Narcotic analgesic are
   a) addict forming
   b) prepared from salicylic acid
   c) also used to cure tuberculosis
   d) not addict forming
8. Codein is
   a) narcotic analgesic
   b) non narcotic analgesic
   c) antioxidant
   d) antibiotic
9. Which of the following is used in inflammation?
   a) Bithional b) phenol
   c) Methyl salicylate d) Tetracyclines
10. Which of the following is used in preventation of heart attack ?
    a) Naproxen b) Phenol
    c) Amyl metacresol d) Aspirin
11. Ibuprofen is used as
    a) anti–inflammation
    b) antioxidant
    c) sweetnening agent
    d) to reduce body temperature
12. Which of the following is used in artheritis ?
    a) 2–acetoxobenzoic acid
    b) Butylated hydroxy toulene
    c) Ascorbic acid
    d) Gallic acid
13. The drugs used to reduce body pain is
    a) antipyretics b) analgesic
    c) antacids d) antibiotics
14. Platelet aggregation is inhibited by
    a) boric acid b) aspirin
    c) bithional d) sodium carbonate
15. Paracetamol is used for
    a) to reduce body temperature and body pain
    b) to reduce body pain only
    c) to controll the growth of micro–organism
    d) to reduce body smell

16. Aspirin is prepared by the reaction of $(CH_3CO)_2O$ with
a) phenol b) salicylic acid
c) citric acid d) saccharic acid
17. Antipyretics are medicine compound which
a) relieve pain
b) control maleria
c) reduce body temperature
d) kill bacteria
18. Which of the following is not antipyretic?
a) Paracetamol b) Phenacetin
c) Penicillin d) Aspirin
19. Heroin is
a) narcotic analgesic
b) non narcotic analgesic
c) antimalerial
d) antiseptic
20. Aspirin act as
a) antioxidant
b) antipyretic
c) analgesic
d) antipyretic and analgesic
21. Which of the following is analgesic ?
a) Penicillin b) Diclophenac sodium
c) Ampicillin d) Tetracycline
22. Which of the following is narcotic drug?
a) Aspirin b) BHA
c) Naproxen d) Codeine
23. The following compound is used as



a) antiseptic b) analgesic
c) antimalerial d) antioxidant
24. Chemical name of Aspirin is
a) 3–acetoxybenzoic acid
b) 2–acetoxybenzoic acid
c) 2–acetoacetic acid
d) hydrocyanic acid
25. Morphine diacetate is commonly known as
a) heroin b) methyl acetate
c) dettol d) meprobamate
26. Which of the following is habit forming drug?
a) Brufen b) Analgin
c) Codein d) Novalgin
27. Which of the following is not aromatic compound?
a) Valium b) Ibuprofen
c) Equanil d) Naproxen
28. Heroin is a derivative of
a) nicotin b) caffeine
c) cocain d) morphine
29. The following structure is



a) aspirin b) osazone
c) naproxen d) ibuprofen
30. In which of the following two benzene rings are present
a) aspirin b) ibuprofen
c) naproxen d) equanil
31. Which used in joint pain?
a) Brine b) Linseed oil
c) Benzoic acid d) Naproxen
32. An analgesic is used to
a) kill bacteria b) arrest growth
c) relieve pain d) all of these
33. Which of the following is an analgesic with antipyretic quality?
a) Novalgin b) Naproxen
c) Brofen d) Aspirin
34. 2–acetoxybenzoic acid is an
a) antipyratic, analgesic
b) antibiotic
c) antioxidant
d) antiseptic
35. The compound given below is not antipyretic
a) chloramphenicol b) aspirin
c) ibuprofen d) paracetamol
36. The compound used against pain
a) BHA b) BHT
c) aspirin d) DHA
37. Morphine is used as an
a) antipyretic b) antiseptic
c) analgesics d) insecticide
38. Ibuprofen is commonly used as
a) antipyretics b) antiseptics
c) traquilizers d) analgesics
39. What is the nature of ibuprofen as drug?
a) Analgesics b) Antiviral
c) Antipyretics d) Tranquilizers

40. Aspirin is chemically
a) acetyl salicylic acid
b) containing acetoxy and carboxyl gro~p
c) 2–acetoxy benzoic acids
d) all of these

41. Aspirin do not contain
a) COOH group b) $OCOCH_3$ group
c) OH group d) benzene nucleus

42. Which of the following is non - narcotic analgesics?
a) Morphine b) Heroin
c) Aspirin d) Codeine

43. Aspirin is widely used to prevent heart attack because of its
a) antipyretic property
b) anti–blood clotting action
c) antidepressant
d) pain killing action

44. Aspirin is obtained by the reaction of CH_3COCl with
a) benzoic acid b) salicylic acid
c) phenol d) cresol

TRANQUILIZERS

45. The main cause of depression is
a) low level of noradronaline
b) high level of noradrenaline
c) low level of HCl in stomach
d) high level of HCl in stomach

46. Phenelzine is used in
a) depression b) high fever
c) hyperacidity d) high inflammation

47. Which of the following drug is used in anxiety
a) Dimetapp b) Histamine
c) Iproniazid d) cimetidine

48. Which of the following is addict forming drug?
a) Penicillin b) Ibuprofen
c) Amyl metacresol d) Morphine diacetate

49. The chemical used in mental disease is
a) antipyretics b) antioxidants
c) antibiotics d) tranquilizers

50. Valium is
a) antipyretic b) antibiotic
c) antioxidant d) tranquilizers

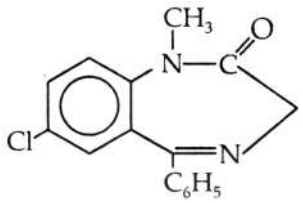
51. Chlordiazepoxide is generally used for
a) hypertension
b) respiratory tract infection
c) water purification
d) neutralization of acid

52. Which of the following durg is used in hyper tension and depression?
a) Salol b) Serotonin
c) Boric acid d) BHT

53. Which is used in discomfort?
a) Equanil b) Hexachlorophene
c) Resorcinol d) Picric acid

54. Psycotherapeutic drugs are also called
a) antacids b) tranquilizers
c) antioxidant d) analgesic

55. The structure given below is



a) equanil b) valium
c) ibuprofen d) naproxen

56. Mood elevators pepills are
a) analgesics b) antacids
c) antibiotic d) antidepressent

57. Tranquilizers affect
a) stomach
b) kideny
c) liver
d) central nervous system

58. Which of the following is antidipressant ?
a) Valium b) Boric acid
c) Sodium bisulphite d) Vitamin–C

59. Which of the following used in insomnia?
a) Antioxidant b) Transquilizers
c) Antacids d) Antibiotic

60. The drug which produce sleep
a) hypnotics b) analgesic
c) antibiotic d) antipyratic

61. Veronal a barbituric drug is used as
a) antioxidant b) sedative
c) antiseptic d) antibiotic

62. Tranquilizers are used to relieve
a) unconsciousness b) stress
c) acidity d) pain

63. Insomnia condition is cured by
a) equanil b) saccharin

c) bithional d) amipicilln

64. Which one of the following is/are traquilizer ?
a) Veronal b) Nardil
c) Equanil d) All of these

65. Iproniazid is used as
a) antiallergic b) antimalarial
c) sedative d) antiseptic

66. Tranquilizers are substances used for the treatment of
a) cancer b) AIDS
c) mental diseases d) physical disorder

67. The substance which affect the central nervous system and induce sleep are called
a) traquilizers b) analgesics
c) antipyretics d) antiseptics

68. Which one of the following is used to reduce depression and hypertension?
a) Aspirin b) Equanil
c) Naproxen d) Ibuprofen

69. Which of the following is/are sedative?
a) Valium b) Penicillin
c) Perhydrol d) Dettol

70. The name of drug, which is used in mental depression?
a) Equanil b) Tetracycline
c) Bithional d) Erythromycin

(ANTACIDS)

71. Which of the following is not antacids?
a) $Al(OH)_3$ b) Na_2CO_3
c) $NaHCO_3$ d) $Mg(OH)_2$

72. Peptic ulcer is heal by
a) streptomycin b) bithional
c) $Mg(OH)_2$ d) boric acid

73. Which of the following is used to increase pH ?
a) Naproxen b) Penicillin
c) $Al(OH)_3$ d) Veronal

74. Antacids are those
a) which rise the pH of stomach
b) which rise the pH of heart
c) which decreases the pH of stomach
d) which rise the pH of liver

75. Which of the following is used in indigestion?
a) $Al(OH)_3$ b) SO_2
c) Brine d) CH_3COOH

76. Which of the following is not used as antacids?
a) $Mg(OH)_2$
b) KOH
c) $Al(OH)_3$
d) Mixture of $Mg(OH)_2$ and $Al(OH)_3$

77. Substance used in hyper acidity are known as
a) Antioxidant b) Antacids
c) Antibiotics d) Antifertility

78. $Al(OH)_3$ is also used like which of the following to neutralise excess acid in the gastric juice?
a) $NaHCO_3$
b) $Mg\ CO_3$
c) Aluminium phosphate
d) All of these

79. Which one of the following is used to raise the PH to appropriate level in stomach?
a) $Ce(OH)_3$ b) $Al(OH)_3$
c) NaOH d) KOH

80. Indigestion, ulcer are caused due to excess of
a) H_2SO_4 b) HNO_3
c) HCl d) $NaHCO_3$

81. When secretion of acid in stomach is increased upto 42 mEg. Then it is known as ?
a) Hypoacidity b) Hyperacidity
c) Insomnia d) Mania

82. Which chemical stimulate the secretion of pepsin and HCl in stomach
a) Histamine b) Omeprazole
c) Lansoprazole d) Cimetidine

83. The drug which neutralise HCl in stomach is
a) Cimetidine b) Ranitidine
c) Omeprazole d) $Mg(OH)_2$

84. Molecular formula of cimetidine is
a) $C_{13}H_{22}N_4O_3S$ b) $C_{10}H_{14}N_4S$
c) $C_{29}H_{36}O_2$ d) $C_{29}H_{34}O_2$

(ANTIHISTAMINE)

85. Main cause of allergy is
a) secretion of dimetane in our body
b) secretion of seldane in our body
c) secretion of histamine in our body
d) secretion of dimetapp in our body

86. The drug used against allergy is
a) Hitamine b) rerfenadine
c) Norethindrone d) ethynyl estradiol

87. Bromopheneramine is used as
a) antiallergy b) antifertility
c) antiacid d) analgesic

ANTIFRETILITY

88. Which of the following is pregnancy control drug
a) Noverstrol b) dimetane
c) seldane d) neproxen

89. Which of the following drug supress the ovluation in female?
a) rerfenadine b) norethindrone
c) valium d) penicillin

ANTIMICRIBIAL (ANTIBIOTICS)

90. Sulphapyridine is
a) analgesic b) antipyratics
c) antibiotics d) antiallergic

91. In body drug prontosil is converted into
a) sulphapyridine b) salvarsan
c) mifepristone d) sulphanilamide

92. Molecular formula of chloramphenicol is
a) $C_{10}H_{15}O$ b) $C_5H_9C_{10}$
c) $C_{12}H_6C_{14}O_2S$ d) $C_{11}H_{12}C_{12}N_2OS$

93. Arsenic containing medicine used for treatment of syphilis is
a) oflaxacin b) penicillin
c) salvarsan d) tetracycline

94. Chloramphenicol is most effective against
a) Dysentry b) Stess
c) Skin infection d) Acidity

95. Which of the following is broad spectrum antibiotic?
a) tetracycline b) Penicillin
c) Ampicillin d) Amoxycillin

96. Cephalosporins are
a) broad spectrum bacteriostatic antibiotic
b) broad spectrum bactericidal antibiotic
c) narrow spectrum bacteriostatic antibiotic
d) narrow spectrum bactericidal antibiotic

97. Which of the following is narrow spectrum antibiotic ?
a) Tetracycline b) Chloromycetin
c) Penicillin d) Erythromycin

98. Which of the following is not an antibiotics?
a) Chloramphenicol b) Bithional
c) Penicillin d) Neomycin

99. Chloramphenicol is
a) dye
b) tranquilizer
c) broad spectrum antibiotics
d) narrow spectrum antibiotics

100. Penicillin was discovered by
a) Alexander Flaming b) Fischer
c) Hoffmann d) Mendius

101. High concentration of streptomycin is a
a) hypnotic tranquilizer
b) bactericidal antibiotic
c) bacteriostatic antibiotic
d) antioxidant

102. Which of the following is used in respiratory tract infection ?
a) Oflaxacin b) Tranquilizers
c) BHT d) BHA

103. Which of the following is used to kill microbs in human?
a) SO_2 b) 1 % phenol
c) Valium d) Oflaxacin

104. The medicine which is antibiotic is
a) aspirin b) ampicillin
c) dettol d) phenol

105. The phenomenon of opposing the growth of one micro–organism by other is called
a) curing b) irradiation
c) pasteurisation d) antibiosis

106. Spectromycin is
a) an tranquilizer b) an antibiotic
c) an antiseptic d) an antipyretic

107. First antibiotic is
a) tetracycline b) chloromphenicol
c) oflaxacin d) penicillin

108. Which of the following is known as narrow spectrum antibiotic ?
a) Amoxycillin b) Ampicillin
c) Penicillin d) Chloramphenicol

109. Identify the class of drugs used in curing disease produced by infection
a) antioxidant b) antibiotic
c) antacids d) sedative

110. Which of the following is not a broad spectrum antibiotics ?
a) Penicillin b) Chloromycetin
c) Tetracycline d) Oflaxacin

111. Molecular formula of chloramphenicol is
a) $C_{11}H_{11}N_3O_2S$ b) $C_{12}H_{13}N_5O_2S$
c) $C_{11}H_{12}C_{12}N_2OS$ d) $C_{12}H_{12}As_2N_2O_2$

112. Chloramphenicol is
a) disinfectant b) antipyretics
c) antiseptics d) antibiotics

113. Molecular formula of sulphapyridine is
a) $C_{11}H_{11}N_3O_2S$ b) $C_{12}H_{13}N_5O_2S$
c) $C_{11}H_{12}C_{12}N_2O_5$ d) $C_{12}H_{12}As_2N_2O_2$

114. Molecular formula of prontosil is
a) $C_{11}H_{11}N_3O_2S$ b) $C_{11}H_{12}C_{12}N_2O_5$
c) $C_{12}H_{13}NsO_2S$ d) $C_{12}H_{12}As_2N_2O_2$

115. Molecular formula of salvarsan is
a) $C_{11}H_{11}N_3O_2S$ b) $C_{11}H_{12}C_{12}N_2O_5$
c) $C_{12}H_{12}As_2N_2O_2$ d) $C_{12}H_{13}NsO_2S$

116. Oflaxacin is a drug used as
a) analgesics b) antipyretics
c) antibiotics d) antiseptic

117. The chemical produced by bacteria, fungi or moulds which can inhibit the growth of other harmful microorganism is called
a) antimalarial b) antibiotics
c) antiviral d) antiseptics

118. Which one of the following is bactericidal antibiotics?
a) Erythnomycin b) Tetracycline
c) Aminoglycosides d) Chloramphenicol

119. Penicillin has general molecular formula
a) $C_9H_{11}O_4SN_2$ R b) $C_{10}H_{11}O_4SN_2$ R
c) $C_9H_{11}O_4N_2$ R d) $C_9H_{11}O_4$ SR

120. Which of the following is bacteriostatic drug?
a) Oflaxacin b) Aminoglycosiders
c) Erythromycin d) Penicillin

121. The antibiotic which kills the harmful microorganism is/are
a) oflaxacin b) penicillin
c) Chloramphenicol d) all of these

122. Tetracyclin, erythromycin and chloramphenicol are
a) bactericidal
b) bacteriostatic antibiotics
c) antiviral drugs
d) antimalerial drugs

123. Which of the following is narrow spectrum bactericidalantibiotic ?
a) Erythromycin b) Oflaxacin
c) Penicillin d) Chloramphenicol

124. Which of the following are sources of antibiotics?
a) Bacteria b) Moulds
c) Fungi d) All of these

125. Which of the following is broad spectrum bactericidal antibiotics?
a) Oflaxacin b) Chloramphenicol
c) Penicillin d) Tetracycline

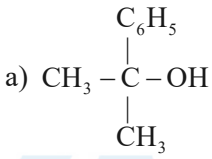
126. Chloramphenicol is
a) bactericidal antibiotics
b) bacteristatic antibiotics
c) antiseptic
d) antimalerial drug

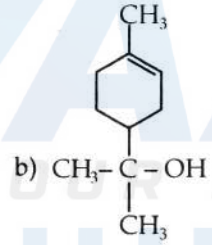
127. Which one of the following inhibit the growth of microorganism ?
a) Tetracycline b) penicillin
c) Oflaxacin d) Aminoglycosides

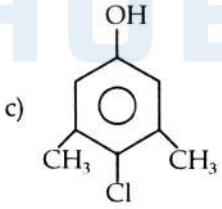
128. The range of microbes attacked by antibiotics is known as
a) spectrum b) bands
c) bacteria d) all of these

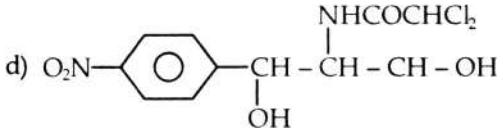
ANTISEPTIC AND DISINFECTANTS

129. Whichof the folloiwng is terpineol

a) 

b) 

c) 

d) 

130. Molecular formula of chloroxylenol is
a) $C_{10}H_{18}O$ b) $C_8H_9C_{10}$
c) $C_{12}H_6C_{14}O_2S$ d) $C_{11}H_{12}C_{12}N_2O_5$

131. Medicinal name of H_2O_2 is
a) Perhydrol b) Aludroxyl
c) Bithional d) Dettol

132. Which is not antiseptic

a) BHT b) iodoform
c) phenol d) boric acid

133. Phenolactas
a) analgesic b) antiseptic
c) disinfectant d) both 'b' and 'c'

134. The chemical substance which is used for disinfectants and preservation of food is
a) SO_2 b) boric acid
c) picric acid d) ascorbic acid

135. H_2O_2 is
a) antibiotic b) antiseptic
c) analgesic d) antacid

136. The antiseptic which are used in soap are
a) perhydrol b) bithional
c) chlorine d) iodine

137. Which of the following is added in soap to being a antiseptic property ?
a) BHA b) Alitame
c) Bithional d) Cyclamate

138. Chemical used in dettol
a) acetic acid b) chloroxylenol
c) phenyl salicylate d) BHT

139. 0.2% solution of phenol act as
a) disinfectants b) antiseptic
c) antioxidant d) analgesic

140. Antiseptic used for eyes is
a) hydrogen peroxide b) boric acid
c) bithional d) dettol

141. 1% solution of phenol is
a) antiseptic b) analgesic
c) disintectant d) preservative

142. Phenol is used as
a) antibiotic
b) antiseptic
c) disinfectent
d) antiseptic and disinfectent

143. Dettol consist of
a) cresol and ethanol
b) xylene and terpineol
c) chloroxylenol and terpineol'
d) xylene and salol

144. Dettol is mixture of chloroxylenol and
a) phenol b) anisol
c) terpineol d) cyclohexanol

145. Which of the following is not directly applied on wounds?
a) Dettol b) 1% phenol
c) Boric acid d) Iodoform

146. Dilute solution of boric acid is used as
a) antibiotic b) antiseptic
c) sedative d) hypnotic

147. Bithional is added to impart antiseptic properties in
a) water b) fertilizer
c) soap d) perfumes

148. Tincture of iodine is
a) topical antiseptic b) analgesic
c) antipyratic d) sedative

149. Which of the following is not antiseptic drug?
a) Iodine b) Phenol
c) BHA d) Iodoform

150. Which of the following are used a antiseptics?
a) Dettol and bithional
b) Iodine and iodoform
c) Dettol, bithional, iodine and iodoform
d) Bithional and 1% phenol

151. Which of the following is used as both antiseptic and disinfectant?
a) Phenol b) Iodine
c) Dettol d) Bithional

152. Which of the following is used as antiseptic in medicated soaps?
a) Phenol b) H_2O_2
c) iodoform d) Bithional

153. Which of the following is/are used disinfectant?
a) Chlorine b) SO_2
c) Phenol d) All of these

154. The disinfectant used for water treatment is
a) phenol b) SO_2
c) chlorine d) iodine

155. Iodoform is used as
a) disinfectant b) antiseptic
c) preservative d) antimalerial

CHEMICALS IN FOOD PRESERVATIVE

156. Refreegeration helps in food preservation by
a) killing the germs
b) reducing the rate of biochemical reaction
c) detroying enzyme action
d) sealing the food with a layer of ice

157. The most common chemical method to preserve fishes is
a) dehydration b) irradiation
c) salting d) by adding sugar

158. Brine is
a) aqueous solution of backing soda
b) aqueous solution of boric acid
c) aqueous solution of benzoic acid
d) aqueous solution of NaCl

159. Brine helps in food preservation by
a) killing the germs
b) destroying the enzyme action
c) sealing the food with layer of salt and prevent the direct contact
d) reducing the available water for the growth of microbes

160. Vinegar contains
a) 6 to 10 % valeric acid
b) 6 to 10 % valium
c) 6 to 10 % acetic acid
d) 6 to 10 % formic acid

161. Irradiation is
a) killing of microbes at high temperature
b) killing of microbes at low temperature
c) killing of microbs by passing high frequency ray
d) all of these

162. Irradiation is carried out by
a) using high temperature
b) using low temperature
c) passing gamma rays
d) using brine

163. Which reduce enough moisture from food?
a) Sugar
b) Benzoic acid
c) Acetyl salicyclic acid
d) Vinegar

164. SO_2 is used as
a) preservative b) antioxidant
c) sweetening agent d) both 'a' and 'b'

165. Which of the following is not physical method for preservation?
a) Irradiation b) Salting
c) Freezing d) Heating

166. The cause of food spoilage
a) presence of moisture
b) absence of moisture
c) presence of vitamin–C
d) presence of vitarnin–B

167. Killing of microbs in food by bombardment of gamma rays is
a) irradiation b) irradication
c) bleaching d) curing

168. Which is to be used to prevent chemical reaction in food?
a) Low temperature b) High temperature
c) Salting d) All of these

169. Enough moisture in food permits
a) decrease the growth of microbs
b) action of own enzymes
c) increase the vitamin–C
d) decrease the growth of bacterial spores

170. Moisture in food is removed by
a) vaccum drying
b) irradiation
c) irradication
d) by adding H_2SO_4 as drying agent

171. Dehydration method used to
a) induce sleep b) hypnotic
c) food preservation d) relieve pain

172. Which is not a food preservative?
a) Acetic acid b) Citric acid
c) Sodium benzoate d) Sodium bicarbonate

173. Radiation used in irradiation of food is
a) U.V. rays b) β–rays
c) γ–ryas d) all of these

174. Sea foods are best preserved by adding
a) NaCl b) sugars
c) SO_2 d) BHA

175. Microbial activity are minium at pH
a) 8 to 9 b) 4 to 5
c) 7 to 8 d) 10 to 11

176. For sterlization and preservation of squashes which one of the following is used?
a) Chlorine b) 1 % phenol
c) SO_2 d) 0.2 % phenol

177. Sea foods are best preserved by which of the following method?
a) Irradiation b) Curing
c) Pasteurization d) Dehydration

178. Which of the following chemicals used to reduce water content of food material for the preservation?
a) NaCl b) Sucrose
c) Oils d) All of these

179. The physical methods for food preservation is/ are

a) by addition of heat b) by irradiation
c) by removal of heat d) all of these

180. Which of the following method is used to kill microbes in presevation ?
a) Removal of heat b) Addition of heat
c) Removal of water d) All of these

181. Moulds formation in flour confectionery is prevented by using
a) salt of sorbic acid b) Na_2CO_3
c) CH_3CHO d) MgO

182. Which preservative is used in fats?
a) BHA b) Dettol
c) Phenol d) Boric acid

183. Sodium benzoate is
a) antibacterial b) antibiotics
c) preservative d) hypnotic

184. Formalin is
a) 40 % formaldehyde
b) 36 % formic acid
c) 36 % formonitrile
d) 36 % formaldoxime

185. Which of the following is used in fruit juices?
a) SO_2 b) Saccharin
c) Boric acid d) Both a and b

ARTIFICIAL SWEETENING AGENTS

186. Whichof the following is more sweetest agent
a) Alitame b) sucralose
c) aspartame d) saccharin

187. Which of the following is derivatives of sucrose
a) alitame b) sucralose
c) Aspartame d) saccharin

188. Which of the folloiwng does not produces calorie when passed through body
a) sucralose b) sucrose
c) glucose d) fructose

189. $C_{14}H_{18}N_2O_5$ is
a) Aspartame b) Alitame
c) Sucrulose d) Saccharin

190. Saccharin was discovered in
a) 1780 b) 1879
c) 1980 d) 1680

191. Aspartame is
a) antioxidant b) anangesic
c) antipyretic d) sweetening agent

192. Which of the following is artificial sweetener?
a) Sucralose b) BHT
c) BHA d) Boric acid

193. Alitame is
a) sedative b) antioxidant
c) sweetener d) preservative

194. Which of the following is stable at high temperature and unstable at low temperature
a) Saccharin b) Sucralose
c) Alitame d) Aspertame

195. Which of the following is stable in cold and unstable at high temperature
a) Saccharin b) Aspertame
c) Alitame d) Sucralose

196. The non–nutritive sweetener is
a) saccharine b) sucrose
c) fructose d) glucose

ANTIOXIDANT

197. Formation of free radical in food material is protected by adding
a) Dulacin b) alitame
c) BHT d) sucralose

198. $KHSO_4$ is used as
a) antacids b) antioxident
c) antiseptic d) antifertility

199. Molecular formula of BHA is
a) $C_{15}H_{24}O$ b) $C_{12}H_{15}O$
c) $C_{15}H_{12}O_2$ d) $C_{11}H_{16}O_2$

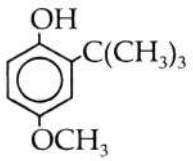
200. Antioxidant are
a) to allow the action of oxygen on food
b) to decresase the pH of stomach
c) to prevent the action of oxygen on food
d) to increase the pH of stomach

201. Which of the following is not used as antioxidant in food?
a) Butylated p–hydroxy anisole
b) Na_2SO_4
c) Alitame
d) $NaHSO_4$

202. The compound which retard the action of oxygen on food are called
a) sacrificial material
b) non sacrificial material
c) chemotherapeutic material
d) all of these

203. BHA is
a) butylated p–hydroxy anisole
b) butylated p–hydroxy aniline
c) butylated p–hydroxy acetylene
d) butylated p–hydroxy acetaldehyde

204. The structure given below known as



a) butylated p–hydroxy toulene
b) butylated p–hydroxy anisole
c) propyl gallate
d) methylated p–hydroxy anisole

205. Which of the following substances retard the action of oxygen on food?
a) Brine
b) Aluminium hydroxide
c) Sodium bicarbonate
d) Butylated hydroxy toulene

206. The chemical substance which are used to prevent decomposition is / are
a) antacids b) antioxidant
c) antipyratics d) analgesic

207. BHA and BHT are most familiar example of
a) hypnotics b) antipyretics
c) antioxidant d) antibiotics

208. Which prevent rancidity of fats
a) aspirin
b) butylated p–hydroxy anisole
c) saccharin
d) phenol

209. Sodium sulphite is used as
a) antiseptic b) sweetening agent
c) antioxidant d) analgesic

210. Which of the following reacts with free radical?
a) hypnotics b) antipyretics
c) antibiotics d) antioxidant

211. To prevent spoilage of food materials, which of the following is used?
a) Antiseptic b) Antioxidants
c) Disinfectants d) Antacids

CLEANSING AGENTS

212. Hard water contains
a) Mg^{++} and Na^{+} ions b) Mg^{++} and K^{+} ioins
c) Mg^{++} and Ca^{++} ions d) Mg^{++} and Ba^{++} ions

213. Soap is reacted with hard water gives
a) insoluble $(RCOO)_2Ca$ and soluble $(RCOO)_2Mg$
b) soluble$(R–COO)_2Ca$ and insoluble $(R–COO)_2Mg$
c) Insoluble $(R–COO)_2Ca$ and $(R–COO)_2Mg$
d) soluble $(R–COO)_2Ca$ and $(R–COO)_2Mg$

214. Which of the following is soapless soap
a) sodium stearate
b) sodium palmitate
c) sodium Lalurate
d) sodium dodecyl benzene sulphonate

215. Which of the following is anionic detergent
a) n–hexadecyl trimethyl ammonium bromide
b) stearyl trimethyl ammonium chloride
c) pentaerylthirtyl stearate
d) sodium lauryl sulphate

216. Pentaeryl thrityl monosterate is an example of
a) Anionic detergent
b) cationic detergent
c) non–ionic detergent
d) soap

217. With oil or grease on cloth soap forms
a) colloid b) gel
c) emulsion d) Sol

218. Cationic detergent is used in
a) tooth paste b) household work
c) hair conditioners d) medicinal syrups

219. Cationic detergent are
a) quaternary ammonium salt
b) tertiary amine
c) polyethylene glycol
d) polyacrylates

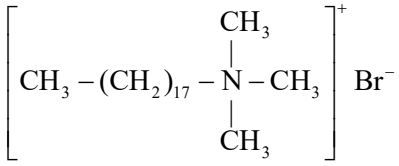
220. Sodium lauryl sulphate is
a) Bio–degradable, cationic detergent
b) Bio–degradable, anionic detergent
c) Non–bio degradable, non–ionic detergent
d) Non–bio degradable, anionic detergent

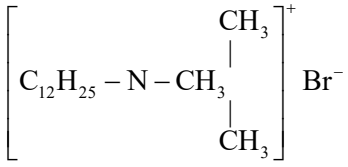
221. Cleasing action of cationic detergent is due to
a) hydrophobic part of cation
b) hydrophilic part of cation
c) hydrophobic part of anion
d) hydrophilic part of anion

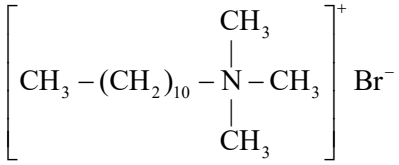
222. Polyethylene glycol stearate is a
a) soap b) anionic detergent
c) cationic detergent d) non–ionic detergent

223. Which of the following is stearyl trimethyl ammonium bromide

a) $\left[CH_3-(CH_2)_{15}-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{N}}-CH_3 \right]^{+} Br^{-}$

b) 

c) 

d) 

224. Liquid washing detergent are
a) anionic types b) cationic types
c) non–ionic types d) soap

225. Which of the following is added in saving soap to prevent rapid drying
a) ethanol b) glycerol
c) dettol d) rosin

226. Which of the following is non–biodegradable detergent?
a) sodium lauryl sulphate
b) dodecyl benzene
c) cetyl trimethyl ammonium acetate
d) polyethylene glycol

227. The detergent used in tooth paste is
a) cetyl trimethyl ammonium acetate
b) stearyl trimethyl ammonium bromide
c) sodium lauryl sulphate
d) polyethylene glycol

228. Bithional is generally added to the soaps as an additive to function as a/an
a) Softener b) Dryer
c) Buffereing agent d) Antiseptic

❍❍❍

BRAIN TEASERS

1. Point out wrong statement
   a) penicillin is antibiotic
   b) ibuprofen is a very important antibiotic
   c) thymol is ued as disinfectant
   d) β–carotene is used as antioxidant
2. In making lemon pickle
   a) chillies are used to kill all germs and bacteria
   b) lemon oil act as preservative
   c) salt playa same role as sugar in jam
   d) in lemon citric acid act as preservative
3. High percentage of SO_2 is used
   a) to controll acidity
   b) to controll fever
   c) to kill micro–organisms
   d) preservative
4. Low percentage of SO_2 is used as
   a) to controll acidity
   b) to controll hypertention
   c) preservative
   d) to kill microbs
5. Find odd of the following
   a) saccharin b) aspartame
   c) alitame d) Aspirin
6. Which of the following is / are used to kill microbs ?
   a) Antiseptics b) Penicillin
   c) Disinfectants d) All of these
7. Which of the following drug combination is not correct?
   a) Chloramphenicol – broad spectrum antibiotic
   b) Equanil – sedative
   c) Phenacetin – antipyretic
   d) Bithional – analgesic
8. Odd man out
   a) naproxen b) diclophenac sodium
   c) ibuprofen d) Equanil
9. Some statments are given below
   1) some disinfectants can be used as antiseptic at low concentration
   2) Bactericidal antibiotic kill bacteria
   3) Penicillin is a bacteriostatic antibiotic
   4) BHA is antacid
   Among the above true statements are
   a) 1,2 and 3 b) 1,2
   c) 1, 3 and 4 d) 3, 4
10. Elements present in salvarsan
    a) C, H, N, A, S b) C, H, O, N, S
    c) C, H, O, N d) C, H, O, A, S
11. Which of the following is not true about antibiotics?
    a) Tetracycline is one of the broad spectrum antibiotics which is effective against a large number of harmfull microbes
    b) Streptomycin is highly effective against microbes which causes tuberculosis
    c) Pencilllin is a narrow spectrum antibiotics and certain persons are sensitive to it
    d) penicillin may be administer without testing the patients for sensitivity to it
12. Which of the following is not true?
    a) Some disinfectant can be used as antiseptic at low concentration
    b) Sulphapyridine is a synthetic antibacterial
    c) Aspirin is a analgelic and antipyratics
    d) Norethindrone is a antiallergic
13. Arsenic drugs are mainly used in the treatment of
    a) jaundice b) typhoid
    c) plague d) syphilis
14. Sulpha drugs are used for
    a) removing bacteria
    b) precipitating of bacteria
    c) stopping the growth of bacteria
    d) decreasing the size of bacteria
15. Which of the following compound is used as body deodorant?
    a) lansoparazole b) penicllin
    c) Bithional d) perhydrol

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