

**A.A.V. PATEL JUNIOR COLLEGE**  
**EXCELLENCE PROGRAM – SYJC – CHEMISTRY**

SYNOPSIS

WEIGHTAGE : 03 MARKS

**CHEMISTRY IN EVERYDAY LIFE**

- ✦ **MEDICINE:** It is a lower molecular mass chemical substance interact with macromolecular target to produce biological response which is therapeutic & useful is called as Medicine.
- ✦ **DRUG:** Drug is defined as a chemical substance which is used for the purpose of diagnosis, prevention, cure or relief of diseases.  
Example : Aspirin, Naproxen
- ✦ **CHEMOTHERAPY:** It is a branch of chemistry which deals with specific treatment of diseases by administration of chemical compound.
- ✦ **CLASSIFICATION OF DRUGS:**
  - (1) Classification based on pharmacological effect
  - (2) Classification based on the action of drugs
  - (3) Classification based on chemical structure
  - (4) Classification based on molecular targets
  - (5) Classification of drugs by lay public
- ✦ **ENZYMES:** The proteins which perform the role of biological catalysts in the body are called enzymes.
- ✦ **RECEPTORS:** The proteins which are crucial to communication system in the body are called receptors.
- ✦ **ANALGESICS:** Drugs which relieve the pain by acting on central nervous system without loss of consciousness or without much disturbing the nervous system are called analgesics.  
**Example:** Aspirin  
There are two types of analgesics:
  - A) Narcotic Analgesics:**  
Drugs which produce depression of the central nervous system and relieve pain instantly are called narcotic analgesics. **Example:** Morphine
  - B) Non – Narcotic Analgesics:**  
These drugs when consumed, do not produce any significant depression of central nervous system but relive pain is called as Non-narcotic analgesics. Example: aspirin

- ✚ **TRANQUILIZERS/ANTI-DEPRESSANT DRUG:** The chemical substance used to relieve or reduce the stress and anxiety leading to calmness is called tranquillizer. **Example:** Equanil
- ✚ **BARBITURATES:** The derivatives of barbituric acids obtained by condensation of urea and malonic acid are called barbiturates.
- ✚ **ANTIMICROBIALS:** The drugs used to kill or stop the growth of micro-organisms like Fungi, Bacteria, Viruses etc are called Antimicrobials.
- ✚ **ANTIBIOTICS:** Antibiotic is a drug derived from living matter or micro-organism, used to kill or prevent the growth of other micro-organisms. **Example:** Penicillin

**There are two types of antibiotics:**

**(1) Bactericidal:**

The antibiotics that kill bacteria in the body are called bactericidal. **Example:** Penicillin

**(2) Bacteriostatic:**

The antibiotics which inhibit growth of bacteria are called Bacteriostatic. **Example:** Erythromycin.

✚ **BROAD SPECTRUM ANTIBIOTICS:**

The antibiotic which are effective against a wide range of gram positive and gram negative bacteria are known as broad spectrum antibiotics. **Example:** Chloramphenicol

✚ **NARROW SPECTRUM ANTIBIOTICS:**

Those antibiotics which are effective against either gram positive or gram negative bacteria are known as narrow spectrum antibiotics. **Example:** penicillin.

✚ **ANTISEPTICS:** Drug which are applied to the living tissues to kill the bacteria and stop their growth in wound, thus preventing its infection. **Example:** Dettol (Mixture of Terpeniol and Chloroxylonol)

✚ **DISINFECTANTS:** Drugs which are applied to non-living objects to kill the micro-organisms. They are used in public health sanitation, floors, to sterilize instruments. **Example:** Sulphur Dioxide

✚ **ANTIFERTILITY DRUGS:** The chemical substances which are used to prevent pregnancy in women are called Anti-fertility drugs. **Example:** Ethynylestradiol (Novestrol)

✚ **ANTACIDS:** The chemical substance which neutralizes the excess of hydrochloric acid in the stomach is called antacid. **Example:**  $\text{NaHCO}_3$

✚ **ANTI HISTAMINE DRUG:** The drugs which inhibit or reduce the action of histamine in the body thereby preventing allergy are called antihistamines. **Example:** Ranitidine (Zintac)



✚ **FOOD PRESERVATIVE:** A Chemical substance which when added to food is capable of inhibiting, retarding or arresting the process of acidification, fermentation, decomposition, oxidation of food by growth of microbes.

✚ **PHYSICAL METHODS OF PRESERVATION OF FOOD :**

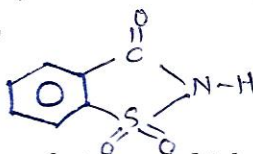
- (1) By removal of heat
- (2) By addition of heat
- (3) By removal of water
- (4) By irradiation

✚ **CHEMICAL METHODS OF PRESERVATION OF FOOD :**

- (1) Addition of sugar
- (2) Addition of salt
- (3) Addition of vinegar
- (4) Addition of chemicals

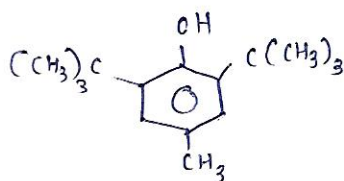
✚ **ARTIFICIAL SWEETENING AGENTS:** The certain chemical compounds which do not occur in nature but are synthesized in the laboratory have sweet taste, but have no food value, are known as artificial sweeteners. Example: Saccharin,

Structure : Saccharin :



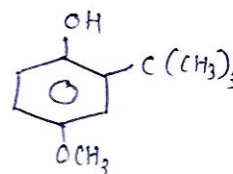
✚ **ANTIOXIDANTS:** Antioxidant is substance which when added to food, retards or prevents oxidative deterioration of food.

EXAMPLES:



1. BHT - Butylated HydroxyToluene

Molecular formula:  $C_{15}H_{24}O$



2. BHA - Butylated HydroxyAnisole

Molecular formula:  $C_{11}H_{16}O_2$

✚ **CLEANSING AGENTS** (Surfactants) : Cleansing agent are chemicals which improves the cleansing action of water and help in removal of fats which bind other materials to a surface, fabric or skin.

✚ There are two types of cleansing agents

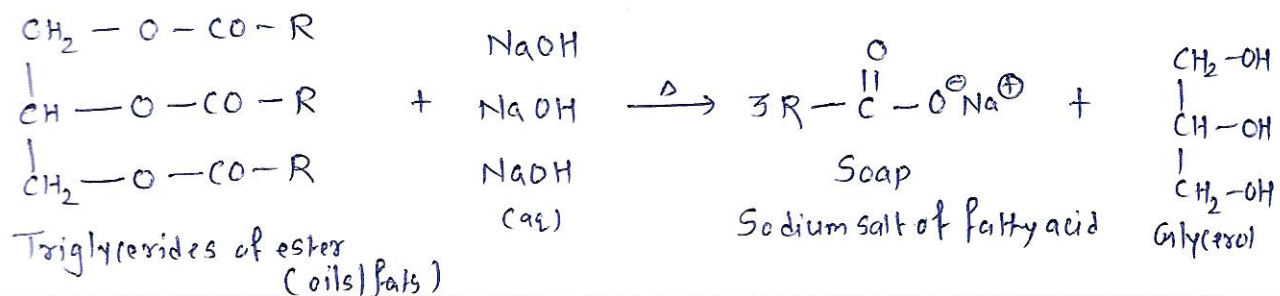
A) SOAPS

B) DETERGENTS

↓ **SOAPS:** Soaps are sodium or potassium salts of higher fatty acids which contain more than 12 carbon atoms. **Example:** Potassium soaps are used in Shampoos , Sodium soaps are toilet soaps

### SAPONIFICATION: ( PREPARATION OF SOAP )

- When oils and fats are heated with solution of sodium or potassium hydroxide, they are hydrolyzed to glycol and sodium (or potassium) salts of fatty acids.(Soap). *This process is called **Saponification**.*



✚ **SYNTHETIC DETERGENTS:** Synthetic detergents are sodium salts of alkyl hydrogen sulphates or sodium salts of long chain alkyl benzene sulphonic acids.

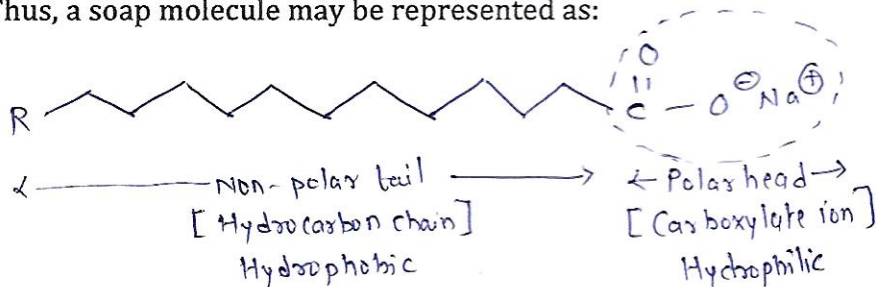
There are 3 types of detergents:

- 1) ANIONIC DETERGENTS:
- 2) CATIONIC DETERGENTS:
- 3) NON-IONIC DETERGENTS:

### MECHANISM OF CLEANSING ACTION OF SOAP

- A molecule of soap has two dissimilar ends. The hydrophobic end of the hydrocarbon chain is water repellent while the hydrophilic end is polar and water soluble due to presence of carboxylate anion.

Thus, a soap molecule may be represented as:



- When soap is dissolved in water, many molecules come together and form a group called micelle because their hydrocarbon chains come together and the polar ends are projected outward.
- When a cloth with a spot of oil and dirt is soaked into Soap solution, Soap dissolves a tiny droplet by hydrophobic end in the middle of the micelle. This forms oil in water type emulsion.
- The anions at the outer end of micelle repel each other and hence they do not precipitate. When the cloth is rubbed, big molecules of oil and Soap break into small emulsified oil droplets. Due to the outwardly projected polar ends, these micelle dissolve in water and are washed away. Thus the cloths get cleaned.

### PREPARATION OF ASPIRIN

