

Name: Chandra Shekhar
College: IIT Gandhinagar
Subject: Chemistry
Weightage: High
Title: Chemistry In Everyday Life

Chemicals in Everyday Life

Detergents: Cleaning Agents

Detergents are cleaning compounds that function well even in hard water. They differ from soap in that they do not form insoluble salts with Ca^{2+} or Mg^{2+} .

Varieties of Detergents

- Anionic Detergents:** Commonly made from long-chain alcohols, they are effective foaming agents.
- Cationic Detergents:** Derived from quaternary ammonium salts, they are known for their germicidal action.
- Non-ionic Detergents:** Produced by reactions between polyethylene glycol and fatty acids such as stearic acid.

Food Additives and Preservatives

Food additives improve shelf life, taste, and appearance of processed foods.

- Preservatives:** These delay microbial spoilage. Sodium benzoate (C_6H_5COONa) is widely used.
- Antioxidants:** Prevent oxidation and spoilage of food fats and oils.
- Artificial Sweeteners:** Non-nutritive substitutes like saccharin enhance sweetness without calories.

Therapeutic Chemicals and Their Role

Drugs are chemical compounds used in diagnosis, prevention, or treatment of diseases.

Classification of Drugs Based on Function

- Antipyretics:** Bring down fever. Example: paracetamol, aspirin.
- Analgesics:** Relieve pain. Examples include ibuprofen, diclofenac sodium.
- Antacids:** Neutralize excess gastric acid. Examples: magnesium hydroxide, aluminium hydroxide gel.
- Antibiotics:** Combat bacterial infections. Examples: penicillin, tetracycline.
- Sulpha Drugs:** Synthetic substitutes for antibiotics. Examples: sulphanilamide, sulphadiazine.
- Antiseptics:** Applied to skin to kill or inhibit microbial growth. Example: dettol, iodine.
- Disinfectants:** Used on surfaces to destroy microbes. Example: 1% phenol solution.
- Anti-fertility Agents:** Used in birth control. Examples: estrogen, mifepristone.
- Tranquilizers:** Reduce anxiety and mental stress. Examples: valium, chlor-diazepoxide.

Overview Table: Drugs and Their Applications

Category	Purpose	Examples
Antacids	Neutralize stomach acid	$Mg(OH)_2$, $Al(OH)_3$, $NaHCO_3$
Antibiotics	Inhibit bacterial growth	Penicillin, tetracycline, ampicillin
Analgesics	Relieve pain	Aspirin, ibuprofen, morphine
Antipyretics	Reduce fever	Aspirin, paracetamol
Antiseptics	Applied to living tissues	Dettol, iodine, boric acid
Disinfectants	Used on non-living surfaces	1% phenol, chlorine
Sulpha Drugs	Synthetic antibacterial	Sulphanilamide, sulphaguanidine

	agents	
Tranquilizers	Calm mental stress	Barbiturates, valium
Anti-fertility Drugs	Prevent pregnancy	Ethynylestradiol, progesterone

Understanding Antimicrobials

Antimicrobials fight infections caused by pathogens. This group includes:

- **Antibiotics:** Produced by microorganisms.
- **Synthetic Agents:** Like sulpha drugs.

Fever and Pain Management

Antipyretics reduce elevated body temperatures during fever.

Analgesics provide relief from mild to severe pain. These may be non-narcotic (aspirin, ibuprofen) or narcotic (morphine, codeine).

Note

Remember all the Structures.