Chapter – 3
Synthetic Fibres and Plastics

- All synthetic fibres are man-made fibres that are prepared by a number of processes using raw material of petroleum origin, called petrochemicals. Synthetic fibres consists of many small units or monomers combine to form a larger unit called a polymer.
- While natural fibres are obtained from plants and animals, synthetic fibres are obtained by chemical processing of petrochemicals. Like natural fibres, these fibres can also be woven into fabrics.
- Synthetic fibres find uses ranging from many household articles like ropes, buckets, furniture, containers, etc. to highly specialized uses in aircrafts, ships, spacecrafts, healthcare, etc.
- Depending upon the types of chemicals used for manufacturing synthetic fibres, they are named as Rayon, Nylon, Polyester and Acrylic.
- The different types of fibres differ from one another in their strength, water absorbing capacity, nature of burning, cost, durability, etc.

Types of Synthetic Fibres:
(i) **Rayon:** It is made from cellulose obtained from wood pulp. It is used to make containers, car upholstery, etc.

(ii) **Nylon:** A polyamide made from petroleum. It is lightweight, strong and durable. The fabric allows easy evaporation and dries quickly. It is used in parachutes, flak vest, combat uniforms, tires, etc.

(iii) **Polyester:** A versatile and important man-made fabric. It has an outstanding characteristic of resisting wrinkle and springing back into its crisp, smooth shape. It is strong and soft. It is used in dresses, suits, rainwear, etc.

(iv) **Acrylic:** A fibre similar to that of wool and is used to make sweater, blankets, shawls, etc. It is lightweight, soft and warm. Also it is cheaper than natural wool. It is resistant to chemicals, moths and sunlight. Therefore, they are widely in use nowadays

Plastics: Like synthetic fibres, plastic is also a polymer. Some plastics have a linear arrangement of the units and some have a cross-linked arrangement of the units. Examples: Polythene. Today, life without plastics cannot be imagined. Be it home, or outside, plastic is every where.

Characteristics of Plastics:

(i) **Non-reactive:** Not affected by air, water, soil, etc.

(ii) **Light, strong and durable:** Light, strong and durable and can be moulded into different shapes and sizes.

(iii) **Poor Conductors:** Do not allow heat and electricity to flow through them.

· The waste created by plastics is not environment friendly. On burning plastics release poisonous gases. On dumping in the ground they may take years to degenerate. This is because of their non-biodegradable nature.· We need to use synthetic fibres and plastics in such a manner that we can enjoy their good qualities and at the same time minimise the environmental hazards for the living communities.·.· ·

· **Effect of Plastics on Environment**: Natural materials like wood and paper are biodegradable (bio = living; degradable = able to broken down). In contrast, most plastics do not decay, therefore, they are non-biodegradable. The lightweight nature of plastics can also be a problem. Burning of plastics also release poisonous fumes into the atmosphere. This way plastics pollute the environment.