

Synthetic fibres

Materials(Two types):

- Natural polymers(wood, cotton, wool, silk, clay and stones)
- Man-made (synthetic fibres, plastics, paints, fertilizers, medicines)

Polymers:

- Synthetic fibres and molecules are made up of polymer molecules
 - Polymer – ‘poly’ means many and ‘mer’ means parts or units
 - Polymer consists of large molecules called macromolecules, composed of many repeating subunits.
- <https://youtu.be/hYIXU4NmSN4>

Polymerization:

- The process by which monomers are linked together to form polymers.
- Polymers – linear in structure or cross-linked

Synthetic fibres:

- Made by humans through chemical synthesis
- Made only from polymers found in natural gas and the by-products of petroleum
- Example: Rayon, Nylon, polyester and acrylic



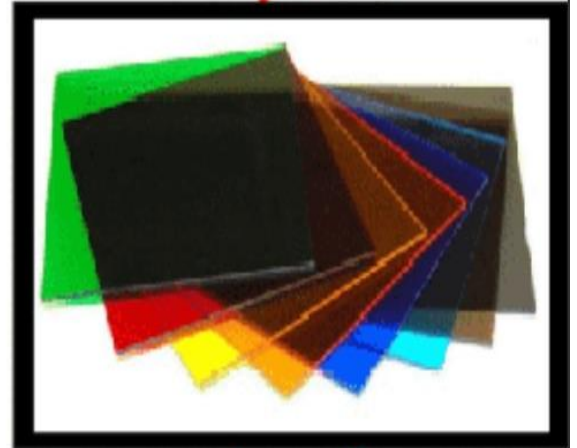
Rayon / Artificial Silk



Polyester



Nylon



Acrylic

Types of Synthetic fibres

Rayon:(Artificial silk)

- Prepared from cellulose(which comes from wood pulp)
- Absorbs sweat – preferred in summer(compared to other synthetic fibres)
- Regenerated fibre(stronger and easier to dye in variety of colours)
- Uses:
 - For making suits, jackets, scarves, ties
 - Home-furnishing (bedsheets, curtains, tablecloths, sofa covers)
 - Bandages

Nylon(coal, water,air):

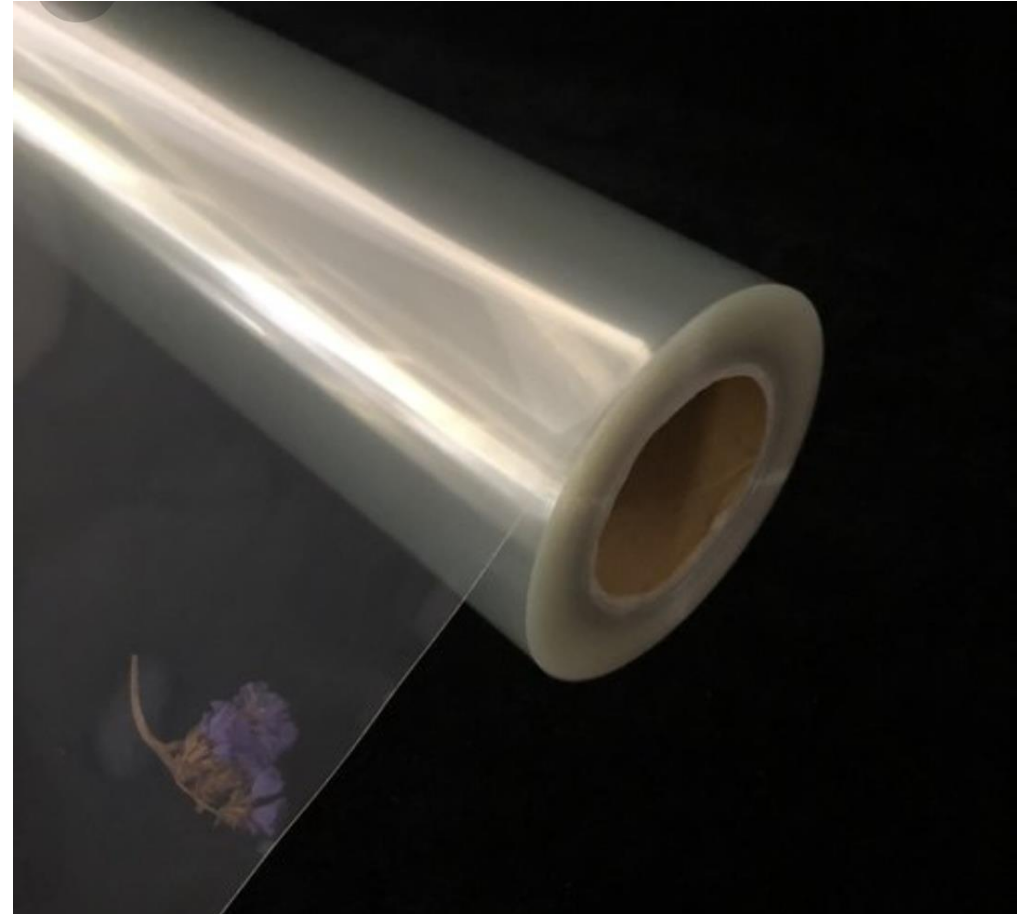
- First synthetic fibre
- Light and wrinkle resistant
- Elastic, strong, lustrous(shining) and waterproof
- For making socks, umbrellas, tents, parachutes, fishing nets, climbing ropes, badminton strings, tennis racquets, toothbrush bristles, combs, sarees, zip fasteners.....

Polyester: Group of different synthetic fibres

- Absorbs very little water- washed and dried very quickly
- Commonly used polyester – Terylene
- Terylene – conveyor belts
- Terry cot – dress materials
- Terry wool – Formal
- Polyethylene terephthalic acid(PET) – used for making polyester films, bottles, utensils, wires..

Polyester:

- Polyester films(mylar) – used for making magnetic recording tapes in audio cassettes, video cassettes and floppy disks



Acrylic:

- A quick drying synthetic textile fibre made of polymerization of acrylonitrile with other monomers
- <https://youtu.be/kiCu4SjrpY0>



Advantages of Synthetics

- Synthetic fibers do not depend either on an agricultural crop or on animal farming.
- They are generally cheaper than natural fibre.
- Synthetic fibers possess unique characteristics which make them popular dress material.
 - They dry up quickly, are durable, readily available and easy to maintain.

Disadvantages of Synthetics

- Synthetic fibers melt before burning
- Some electrical charge accumulates on the synthetic fibers. The electrical charge causes irritation of the skin.
- Extremely hazardous to the environment.
 - Can make you overheat
 - Can make you cold when wet

Plastics:

- A material that can be moulded or formed into different shapes
- Main source – crude oil
- Divided into two groups as Thermoplastics and thermosetting plastics

- <https://youtu.be/2PAIQPLZgoI>

Thermoplastics

Linear and lightly cross-linked polymers form a class of plastics called thermoplastics

Thermoplastics can be melted by heating and moulded into different shapes. This is a reversible process.

PVC(polyvinyl chloride) and LDPE (low-density polyethylene) are examples of thermoplastics.

Thermosetting plastics

Heavy cross-linking after shaping the plastic forms a class of plastics called thermosetting plastics

Unlike thermoplastics, thermosetting plastics cannot be remoulded after reheating.

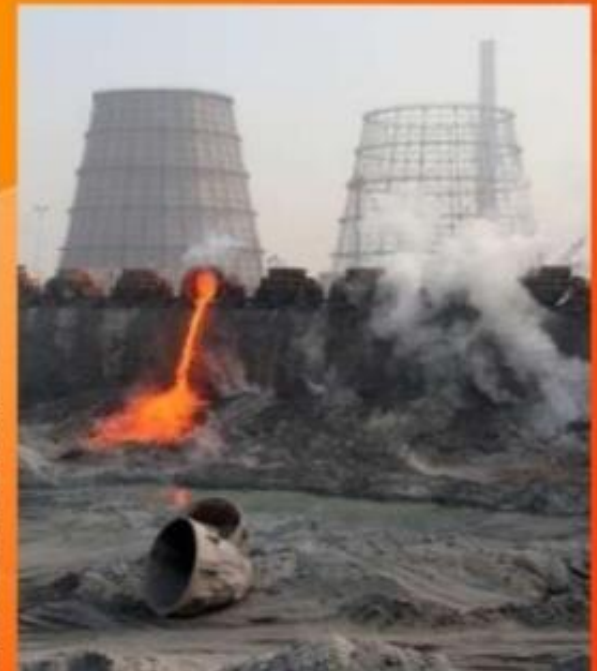
Melamine and bakelite are examples of thermosetting plastics.

Properties of plastics:

- Low thermal conductivity
- Poor conductors of electricity
- Insoluble in water
- Inflammable
- Do not corrode easily
- Inexpensive
- Lightweight and strong
- Thin and flexible

Plastic....Harm to Environment

Plastics have transformed modern society, providing attractive benefits but also befouling waterways and aquifers, depleting petroleum supplies and disrupting human health.



Be Alert...Melamine Cancer

If you eat in a Melamine Plate, you may become a victim of Melamine Cancer. Melamine is a thermosetting plastic and is non-biodegradable. While eating when we scratch the plate with the spoon, the melamine coating also goes into our body which may cause Cancer.

Check under your plates whether Melamine made is written or not. Use Bone China, Glass or Steel Plates instead



The 3 R's

Reducing the amount of waste you produce is the best way to help the environment. Instead of throwing things away, try to find ways to use them again! Many of the things we use every day, like paper bags, soda cans, and milk cartons, are made out of materials that can be recycled.

