SYNTHETIC FIBRES AND PLASTICS

(For Board)

Synthetic Fibres And Plastics:

Fabrics are made from fibres obtained from natural or artificial sources.

Fibres are also used for making a large variety of household articles.

Natural fibres: These are obtained from plants or animals.

Ex: cotton, wool, silk, etc.,

Synthetic or man-made fibres: These are made by human beings.

Synthetic Fibres And Plastics:

Monomer

Synthetic or man-made fibres:

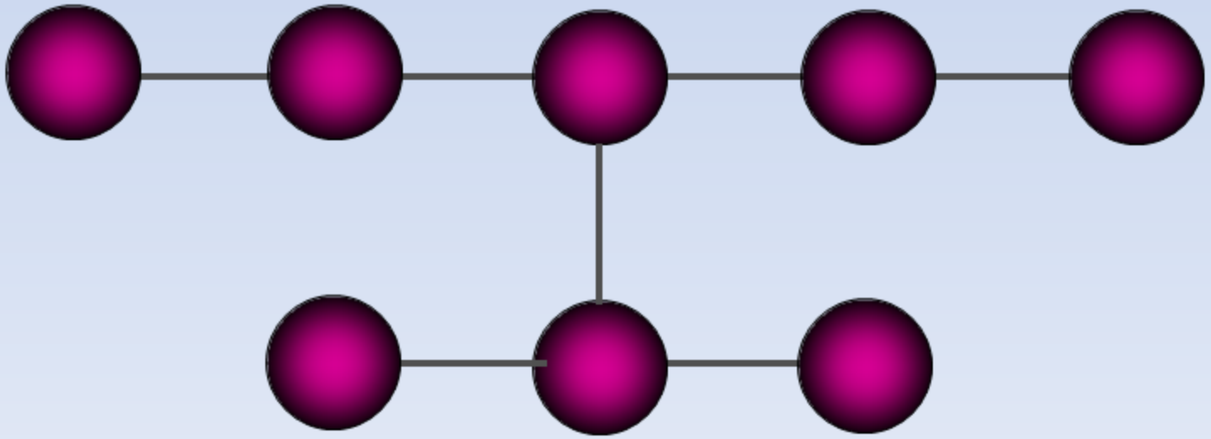
This fibre is made up of small units (monomers) joined together.

Each monomer is a chemical substance.

Polymer: Polymer comes from two Greek words;

Poly means many & mer means part or unit.

Hence, many monomers combine to form a large single unit.



Types of Synthetic Fibres:

Rayon or artificial silk:

This fibre is obtained by chemical treatment of wood pulp.

Although rayon is obtained from a natural source, wood pulp, yet it is a man-made fibre.

It is cheaper than silk & can be woven like silk fibres.

Rayon + cotton = bed sheets

Rayon + wool = carpets

Types of Synthetic Fibres:

Nylon: It is prepared from coal, water & air.

This fibre is strong, elastic & light.

It is lustrous & easy to wash.

So, it is very popular in manufacturing clothes.

Types of Synthetic Fibres:

Nylon Materials:

Socks

Toothbrushes

Car seat belts

Sleeping mats

Curtains

Parachutes

Ropes

A Nylon thread is stronger than a steel wire.

Types of Synthetic Fibres:

Polyester:

Fabric made from this fibre does not get wrinkled easily.

It remains crisp & is easy to wash.

So, it is quite suitable for making dress material.

Terylene is a popular polyester.

Types of Synthetic Fibres:

Polyester:

It is made up of repeating units of an ester.

Esters are the chemicals which give fruits smell.

Fabrics are sold by names like polycot, polywool, terrycot, etc.

Polycot = polyester + cotton.

Polywool = polyester + wool.

Types of Synthetic Fibres:

PET (Poly Ethylene Terephthalate): It is very familiar form of polyester.

It is used for making bottles, utensils, films, wires & many other useful products.

Water bottles

Wires

Utensils

Films

Types of Synthetic Fibres:

Acrylic: Artificial wool

Acrylic is cheaper than natural wool.

It is used in making sweaters, shawls & blankets.

Sweaters

Shawls

Blankets

Characteristics of Synthetic Fibres:

- Cheaper
- Stronger
- Easy to wash
- Dry up quickly
- Readily available

Disadvantages: Synthetic fibres melt on heating.

When these fibres get burnt, they melt & stick to the body of the person.

So we should never wear clothes made of synthetic fibres while working in the kitchen or in the laboratory.

Petrochemicals: Those chemicals which are obtained from petroleum & natural gas.

Plastics:

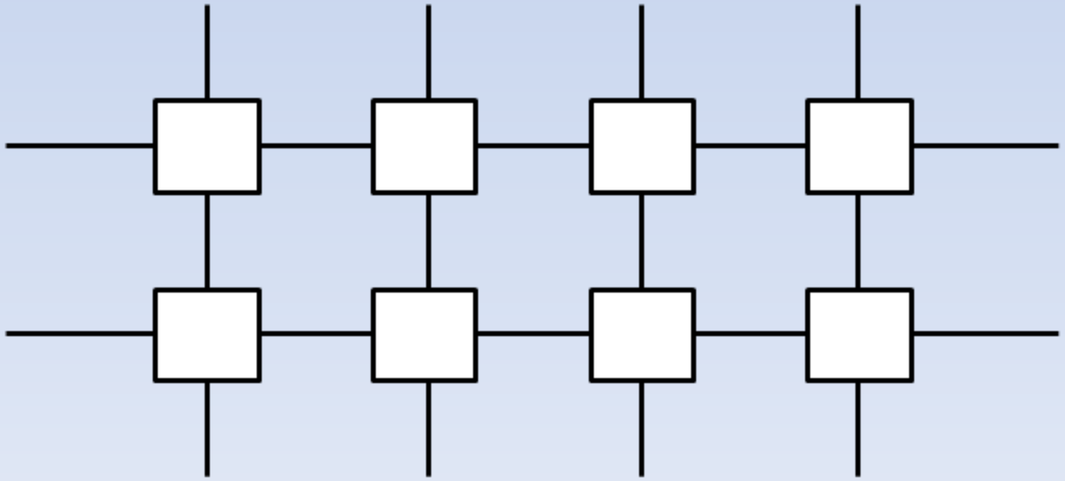
It is also a polymer like the synthetic fibre.

Ex: Polythene (Poly + ethene) Used in making polythene bags.

All plastics do not have the same type of arrangement of units.

In some it is linear, whereas in others it is cross-linked.

Linear arrangement



Cross linked arrangement

Plastics:

Plastic is easily mouldable i.e. can be shaped in any form.

These can be recycled, reused, coloured, melted, rolled into sheets.

Used in covering of wires, handle of electric flasks, kitchen wear, etc.

Plastics:

Thermoplastics:

These plastic gets deformed easily on heating & can be bent easily.

Ex: Polythene & PVC (Poly Vinyl Chloride).

Uses: Manufacturing toys, combs & various types of containers.

Plastics:

Thermosetting plastics:

These plastics when moulded once, cannot be softened by heating.

Ex: Bakelite & melamine.

Bakelite:

It is a poor conductor of heat & electricity.

It is used for making electrical switches, handles of various utensils, etc..

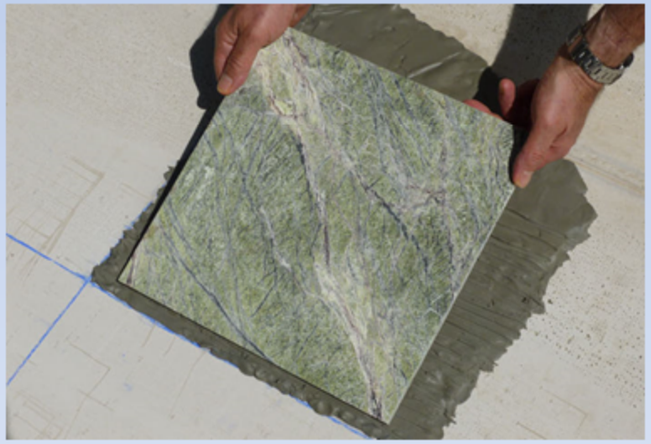
Plastics:

Thermosetting plastics:

Melamine: It is a versatile material.

It resists fire & can tolerate heat better than other plastics.

Used for making floor tiles, kitchenware & fabrics which resist fire.



Plastics as Materials of Choice:

Storing a food items in plastic containers are most convenient.

Due to their light weight, lower price, good strength & easy handling.

Being lighter as compared to metals, plastics are used in cars, aircrafts & spacecrafts.

Plastic is Non-reactive:

Plastics do not react with water & air.

They are not corroded easily.

So, they are used to store various kinds of material, including many chemicals.

Characteristics of plastics:

Plastic is very light, strong, durable & can be moulded into different shapes & sizes, it is used for various purposes.

These are generally cheaper than metals.

They are widely used in industry & for household articles.

Plastics are Poor Conductors:

These are poor conductors of heat & electricity.

So, electrical wires have plastic covering & handles of screw drivers are made of plastic.

Plastics and the Environment:

Biodegradable:

A material which gets decomposed through natural processes,

such as action by bacteria.

Non-biodegradable:

A material which is not easily decomposed by natural processes.

Plastics and the Environment:

Type of waste	Approximate time taken to degenerate	Nature of material
Peels of vegetable & fruits, leftover foodstuff, etc.	1 to 2 weeks	Biodegradable
Paper	10 to 30 days	Biodegradable
Cotton cloth	2 to 5 months	Biodegradable
Wood	10 to 15 years	Biodegradable
Woollen clothes	About a year	Biodegradable
Tin, aluminium & other metal cans	100 to 500 years	Non-biodegradable
Plastic bags	Several years	Non-biodegradable

Plastics and the Environment:

Plastics takes several years to decompose. It causes environmental pollution.

When plastics burns, it releases lots of poisonous fumes, causing air pollution.

To avoid this problem,

Make use of bags made of cotton or jute.

Biodegradable & non-biodegradable wastes should be collected separately & disposed of separately.

It is better to recycle plastic waste.