

Board –CBSE

Class –8<sup>th</sup>

Topic – Fibers and Plastic

## ☑ Introduction

- Man-made fibres: fibre made by human beings are called synthetic or man made fibres. They are not directly derived from natural sources. E.g. Nylon, rayon, polyester etc.
- Synthetic fibres and plastics are made up of molecules called polymers.
- A synthetic fibre is a chain of small units joined together. Each small unit is actually a chemical substance many such a small unit combine to form a large single unit called a polymer.
- The word polymer comes from two Greek words; poly means many and mer means part/ unit.
- So, a polymer is made up of many repeating units.
- A polymer is a large molecule formed by combination of many small molecules, each of which is called a monomer.
- The structure of polymer can be compared to that of bead necklace- the bead being the monomers.
- The process of combining the monomers to form a polymer is called polymerization.

## ☑ Types of Synthetic fibres

- Rayon
- Nylon
- Polyester
- Acrylic are some synthetic fibres.

## ☑ Rayon

1. Rayon (artificial silk) made from wood pulp, a naturally occurring cellulose based raw material.

2. Rayon is moisture-absorbent and comfortable to wear.

## ☑ Uses

- Home furnishings such as bedspreads, bed sheets, blankets, curtains, tablecloth, carpets etc. are made from rayon fibre, as it has a silky lustre.
- It is strong fibre, it is used in automobile tyre cords.
- It is used to make apparel such as suits, jackets, slacks etc.

## ☑ Nylon

1. Nylon was the first synthetic fibre to be made entirely from chemicals.
2. Basic raw materials for production of nylon are coal, petroleum oil, water and air.
3. Nylon fibre is very strong and elastic.
4. It is light and wrinkle-resistant.
5. It is easy to wash and absorbs very little water.

## ☑ Uses

- Garments such as saris are made from nylon. Since it is wear resistant, garments made from it last for a long time.
- Being very strong, nylon fibre is used to make ropes, tents, fishing nets and parachutes.
- It is also used to make toothbrushes, combs, zip fasteners and machine parts.

## ☑ Polyester

- Polyester is a polymer of many ester units.
- Polyester is manufactured from petroleum
- Polyester fibres are extremely strong, very durable, resistant to most chemicals and do not get wrinkled easily.
- Polyester does not absorb water, so it dries quickly.
- PET (Polyethylene terephthalate), the commonly used polyester, is made from two monomers by condensation polymerization.

## ☑ Uses

- Polyester is used to make pants, shirts, suits & bed sheets either by itself or as a blend.
- Its water- resistant property makes it ideal for garments & jackets that are to be used in wet or damp environments.

## ☒ **Acrylic**

- Acrylic is a light weight soft and warm synthetic fabric which has a wool like feel.
- It does not shrink is wrinkle- resistant and cheaper than wool.
- It can also be dyed very well in a variety of colour.

## ☒ **Uses**

- Strong & warm, acrylic fibre is often used for making sweaters and tracksuits and as linings for boots and gloves as well as in furnishing fabrics and carpets.
- It is used in craft yarns, boat sails and vehicle covers.

## ☒ **Characteristics/ Advantages of synthetic fibres**

- They are stronger, more elastic and make tough and durable fabrics.
- They are colour- resistant and do not bleed colour when washed.
- They are easy to wash and dry and also do not shrink when washed.
- They are resistant to attack by moths.

## ☒ **Disadvantages of Synthetic fibres**

- Synthetic fibres cannot absorb moisture. This makes them unsuitable to be worn during summers when our body sweats.
- It is dangerous to wear them while working near fire, as they catch fire easily.
- They cannot be easily ironed as they melt very easily.
- They are not environment friendly.

## ☒ **Plastics**

A material is said to be 'plastics' if it can be moulded or formed into different shapes.

### **Classification**

Plastics can be broadly classified as thermoplastics and thermosetting plastics based on how they react to heat.

## ☑ Properties & Uses of plastics

- Plastic are poor conductors of heat and electricity. So they are used to make covering of electric wires and handles of tools.
- Plastics are highly resistant to chemicals and water.
- Plastics are lightweight, strong and durable and are therefore used to make parts for aircrafts, cars etc.

## ☑ Problems with excessive use of plastics

- Plastics are non- biodegradable and do not decompose for several years. When plastics are burnt, toxic fumes are released into the atmosphere causing pollution.

## ☑ How can this problem be solved?

- Never throw plastic bags or other plastic articles into water bodies, drains or on roads.
- Carry cotton or jute bags for shopping.
- Buy products with less plastic packaging.
- Recycling and reuse of plastics should be encouraging.

### **Biodegradable and nonbiodegradable**

A material which gets decomposed through natural processes such as action by bacteria is called biodegradable. A material which is not easily decomposed by natural processes is termed as non biodegradable.

**5R Principle-** Reduce, Reuse, Recycle, Recover and Refuse.