8th – Synthetic Fibres and Plastics I

We may use many materials in our daily life. Some are made up of natural materials such as wood, cotton, stones and clay. A material can be used to make different kinds of things. For example: glass can be used to make bowls, tumblers, window panes etc. The material may be naturally occurring or man - made. For example, wool, cotton, jute and marble are naturally occurring materials. Glass, paints, steel, cement, thermocole, plastic, nylon are man - made materials.

Types of materials

- Natural fibres are of two types: plant fibres like cotton and jute and animal fibre like wool and silk. The fibres made from simple chemical molecules called monomers.
- Monomers join in large number to form a long chain of molecules called polymers. The polymers which occur in nature are called natural polymers.
- Cellulose, silk, wool, proteins are natural polymers. The polymers which are made in laboratories from small molecules are called man - made polymers for example nylon, polythene, rayon etc.

Synthetic Fibres

Fibres that are made by human beings are called synthetic fibres. Most synthetic fibres are obtained from coal, petroleum and natural gas. Synthetic fibres are non - biodegradable, easy to maintain, long lasting and less expensive. A synthetic fibre consists of multiple units, joined together to form a single unit called a polymer.

Rayon Silk: It is also called artificial silk, has a silky texture and is prepared from cellulose. The original raw material cellulose is broken down and then reformed in the lustrous fibre called 'rayon'. Rayon was the first synthetic fibre formed from natural raw material. As it is prepared from cellulose so it is not a true synthetic fibre. It is known as semi - synthetic fibre.

Properties

- It is first synthetic fibre.
- It absorbs sweat because blended with cotton. Rayon clothes are therefore preferred over other synthetic fibres in summer.
- It is shiny and lustrous and resembles silk in appearance.

Uses

- It is used in the textile industry making fabrics, which are mixed with cotton or silk to make smooth and silky clothes.
- It is blended with wool to for making carpets.
- Used to making reinforced tyre.
- Rayon is used for making shirts, ties, home furnishings and bandages.

Nylon : Nylon is the first true synthetic fibre. It was the first synthetic fibre produced chemically. It was discovered by Wallace Carothers in 1935. The name nylon was derived from New York and London. The nylon fibres are elastic, strong and water resistant.

Properties.

- It is elastic and does not lose strength even after repeated use.
- It is lustrous and easy to wash.
- They are water and wrinkle resistant.

Uses

- It is used for making fishing nets, climbing ropes, parachute ropes.
- It is used for making bristles for brushes .
- It is used for making sarees, socks, neck ties.
- It is used for making elastic hosiery.

Polyester: They are made from petroleum products. Terylene, decrons and terene are polyester fibre. Polyester clothes are long lasting, water and wrinkle resistant and are of different types. The most commonly used polyester is Terylene. It is blended with natural fibres to improve its properties.

1. Terycot is a blend of cotton and terylene.
2. Terylene is blended with wool to make terrywool.

Properties

- It is strong, lightweight, and has good elasticity.
- It is wrinkle resistant as it resists wrinking and springs back into shape when creased.
- Polyester fabrics can be washed and dried easily and quickly.

Uses

- Used for making sarees, dress materials, curtains and clothes.
- It is used for making sails for sail boats.
- It is used for making conveyor belts.
- It is used for making lightweight sails.
- Polyester films known as Mylar are used for making magnetic recording tapes, in audio cassettes, video cassettes etc.

Acrylic : Acrylic fibre also called Orion and Acrylon, closely resemble wool. They are resistant to weathering.

Properties

- It is warm, soft, light and flexible.
- It is resistant to withering
- It is resistant to moths and chemicals.

Uses

It is used for making thread for knitting sweaters. They are also used to make wool like in blankets and shawls, which are very light and warm.

Spandex: Spandex, also known as Lycra, was invented by the DuPont chemist Joseph Shivers in 1959.

Properties

It has excellent elasticity, which makes it suitable for use in clothes that require snug fitting.

Uses

- Spandex is used for making swimming costumes.
- It is often mixed with other Fibres, like cotton, to get stretch fabrics.
- It is used for making caps and T-shirts.

Advantages of synthetic Fibres

1. These fibres have high lustre and they do not turn yellow with age.
2. They are easy to clean and dry quickly
3. They do not shrink on washing
4. They need very little or no ironing.
5. They last longer as compared to natural fibres.
6. They are less expensive as compared to natural fibres.
7. Most synthetic fibres can handle heavy loads without breaking.

Disadvantages of synthetic Fibres

1. They easily melt and burn to form small sticky beads at a very high temperature. Therefore, there is always a risk of getting burns, especially in kitchen.
2. They cannot absorb sweat. Therefore, clothes made from synthetic fibres are very uncomfortable in summer or rainy season.
3. They get electrically charged in dry weather. This electric charge causes skin problems in some persons.
4. They are non - biodegradable and hence cause pollution.