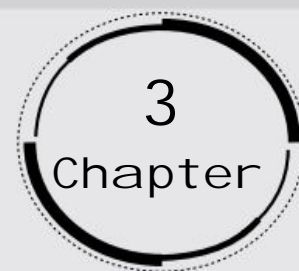


Synthetic Fibers and Plastics



1. Explain why some fibers are called synthetic.

Ans: Some fibers are called synthetic because-

- They are man-made, meaning they are made from chemicals like petrochemicals.
- They are artificial fibers made with or without using any natural raw material from plants or animals.
- Synthetic fibers are typically a chain of small units joined together to form a large single unit called a polymer.
- Examples of synthetic fibers are nylon, rayon, acrylic, and polyester.

2. Mark the correct answer.

Rayon is different from synthetic fibers because

- (a) It has a silk-like appearance.
(b) It is obtained from wood pulp.
(c) Its fibers can also be woven like those of natural fibers.

Ans: (b) it is obtained from wood pulp

Rayon is obtained from a natural source, wood pulp; while most synthetic fibers are made without using any natural raw material from plants or animals.

3. Fill in the blanks with appropriate words.

(a) Synthetic fibers are also called _____ or _____ fibers.

Ans: artificial or man-made

(b) Synthetic fibers are synthesized from raw material called _____.

Ans: petrochemicals

(c) Like synthetic fibers, plastic is also a _____.

Ans: polymer

4. Give examples which indicate that nylon fibers are very strong.

Ans: Nylon is a man-made fiber produced from coal, water, and air. It is strong, elastic, and light. It is said to be stronger than steel wire. Because of this property, nylon is used for making parachutes and ropes for rock climbing. It is also used in seat belts for cars and fishing nets as well.

5. Explain why plastic containers are favored for storing food.

Ans: Plastic containers are most convenient for storing food because:

- of their lightweight, good strength, lower price, and easy handling.
- Most importantly plastic containers do not react with the food item that is stored in them, making them safe to store.

6. Explain the difference between thermoplastic and thermosetting plastics.

Ans: The difference between thermoplastic and thermosetting plastics is given below,

| Thermoplastic | Thermosetting plastic |
|--|---|
| They can be bent easily. | They cannot be bent easily; instead, they break up on applying force. |
| They soften upon heating. Hence they can be remolded and reshaped. | They do not soften upon heating. Hence they cannot be remolded and reshaped. |
| These have been used for the production of combs, toys, and different kinds of containers. | It has been used for creating electrical switches, handles of different utensils, for manufacturing floor kitchenware, tiles, and fabrics that resist fire. |
| Examples: Polythene and PVC | Examples: Bakelite and melamine |

7. Explain why the following are made of thermosetting plastics.**(a) Saucepan handles**

Ans: Saucepan handles – Thermosetting plastics, such as melamine, are used because they resist fire and can withstand heat better than other polymers. They also don't easily bend or melt when heated.

(b) Electric plugs/switches/plug boards

Ans: Electric plugs/switches/plug boards – They are made from thermosetting plastics like bakelite because it is a poor conductor of heat and electricity. Thus in case of any short or current leakage, it will not allow the electricity to pass and harm the user.

8. Categorize the materials of the following products into 'can be recycled' and 'cannot be recycled'.

Telephone instruments, plastic toys, cooker handles, carry bags, ball point pens, plastic bowls, plastic covering on electrical wires, plastic chairs, electrical switches.

Ans:

A. Can be recycled:

- Plastic toys
- Carry bags
- Ball point pens

- Plastic bowls
- Plastic covering on electrical wires
- Plastic chairs
- Electrical switches

B. Cannot be recycled:

- Telephone instruments
- Cooker handles
- Electrical switches.

9. Rana wants to buy shirts for summer. Should he buy cotton shirts or shirts made from synthetic material? Advise Rana, giving your reason.

Ans: Rana should buy cotton shirts for summer because cotton can absorb the sweat easily and allows the evaporation of sweat through its pores, helping Rana to cool down his body during the hot summer season. Also, it is not advised to buy synthetic shirts because the synthetic fibers do not absorb sweat and make it uncomfortable during the hot climate.

10. Give examples to show that plastics are non corrosive in nature.

Ans: Plastics are non corrosive in nature because-

- They do not react with water and air. That is why an exposed iron nail rusts, but plastic remains unaffected.
- Plastics do not react even with most chemicals. For example, cleaning materials like acid and detergents are usually stored in plastic containers but not in metal containers.
- Plastic is used to store food as well because it does not react with the food stored in it. For example, we store pickles, dry food in plastic containers but not in metal containers.

11. Should the handle and bristles of a toothbrush be made of the same material? Explain your answer.

Ans: No, the handle and bristles of a tooth brush should not be made of the same material because the bristles which are used to brush our teeth must be soft and flexible; while the handle which we hold and grip on must be hard and strong.

That is why the bristles are made up of nylon, while the handle is made of thermosetting plastics like melamine or bakelite.

12. 'Avoid plastics as far as possible'. Comment on this advice.

Ans: 'Avoid plastics as far as possible' as-

- Plastics are non-biodegradable in nature, meaning it is not easily decomposed by natural processes. Plastics typically take several years to decompose and are not environmentally friendly. They tend to cause environmental pollution as well.

- Even when the plastics are burnt to get rid of them, they do not burn completely and would release poisonous fumes into the atmosphere causing air pollution.
- The plastic bags which are thrown in dumps are eaten and swallowed by animals like cows, which would choke the respiratory tracts of the animal, resulting in its death.
- There are also cases of plastic bags clogging our drainage systems.
- Hence we should avoid them as much as possible and try to use plastic alternatives like cotton or jute bags.
- As responsible citizens, we must be environmentally friendly and practice Reduce, Reuse and Recycle principles.

13. Match the terms of column A correctly with the phrases given in column B.

| A | B |
|---------------|--|
| (i) Polyester | (a) Prepared by using wood pulp |
| (ii) Teflon | (b) Used for making parachutes and stockings |
| (iii) Rayon | (c) Used to make non-stick cookware |
| (iv) Nylon | (d) Fabrics do not wrinkle easily |

Ans:

- (i) Polyester - (d) Fabrics do not wrinkle easily
 (ii) Teflon - (c) Used to make non-stick cookware
 (iii) Rayon - (a) Prepared by using wood pulp
 (iv) Nylon - (b) Used for making parachutes and stockings

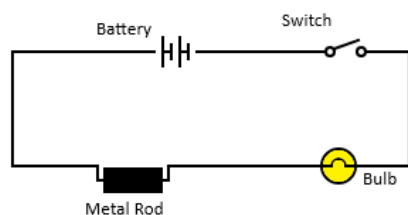
**14. ‘Manufacturing synthetic fibers is actually helping conservation of forests’.
Comment.**

Ans: It is true that manufacturing synthetic fibers is actually helping conservation of forests. As synthetic fibers are man-made, meaning they are made from chemicals like petrochemicals. Synthetic fibers are artificial fibers that can be made with or without using any natural raw material from plants or animals. Thus their existence has helped in the substitution of natural fibers like cotton, silk, wool, jute which are obtained from plants and animals. So it means that trees need not be cut down for their production, since there is a man-made alternative. This can aid in preventing deforestation as well.

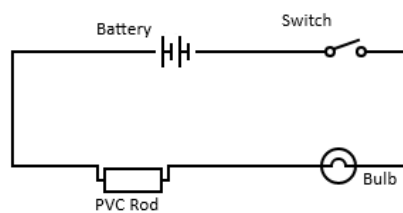
15. Describe an activity to show that thermoplastic is a poor conductor of electricity.

Ans: In order to show that thermoplastic is a poor conductor of electricity, let us make use of a simple circuit with a bulb, battery, switch, metal rod, and PVC (thermoplastic) of the same dimensions, and connecting wires.

- Set up two circuits as shown below.



(i)



(ii)

- Switch on the circuit.
- It is observed that in the first case (i), with a metal rod, the bulb lights up. It implies that the metal rod is a good conductor of electricity.
- In the second case (ii), with a PVC pipe, the bulb does not light up. It implies that the PVC i.e. thermoplastic is a poor conductor of electricity.