

Chapter 03 Synthetic Fibres and Plastics Book Science Mission Solution

Exercises

A. Multiple choice questions.

1. Which of these is thermoplastic in nature? (a) Teflon (b) Rayon (c) Bakelite (d) Polythene
2. To make a pan non-stick, we should get it coated with (a) Bakelite (b) Teflon (c) Rayon (d) Polythene
3. Poly wool fibre is (a) Natural (b) Synthetic (c) Monomer (d) Blended
4. The plastic that cannot be molten or moulded on giving it a shape is
(a) Thermoplastic (b) Polyurethane (c) Thermoset (d) Acrylic
5. Raw material for rayon comes from (a) Cellulose (b) Coal (c) Petroleum (d) Animal bones

Ans: 1. d 2. b 3. b 4. c 5. a

B. Match the following:

Column A	Answer	Column B
1. Rayon	1. c	a. Thermocol
2. Teflon	2. d	b. Mattresses
3. Acrylic	3. e	c. Dress material
4. Polycot	4. f	d. Non-stick cookware lining
5. Polyurethane	5. b	e. Synthetic knitting wool
6. Polystyrene	6. a	f. Blended dress material.

C. Fill in the blanks

1. Wool is a ... fibre.
2. Base raw material for rayon is
3. Plastic made from ethylene is called _____
4. Tensile strength of nylon is..... than that of cotton.
5. Melamine is a..... plastic.
6. A mixture of fibreglass and rayon is used in.....
- 7..... is the synthetic fibre used as wool.
8. is known as artificial silk.
9. Teflon is. plastic.
10. Polymer is a long chain of... ..

Ans: 1. natural 2. cellulose 3. polyethylene 4. greater 5. Thermoset
6. helmets 7. Acrylic 8. Rayon 9. Thermoset 10. monomers

D. State whether 'true' or 'false'.

1. Man-made fibres are synthetic fibres. True
2. Polymers are a chain of monomers. True
3. Plastics do not corrode or rust. True
4. Most plastics are biodegradable. False
5. Plastics are good conductors of electricity. False
6. Plastic melamine is fire resistant. True
7. Bakelite is a soft and flexible plastic. False
8. Cellulose is a natural polymer. True
9. Synthetic fibres shrink on washing. False
10. Acrylic wool is a synthetic fibre. True

E. Give one word answer.

1. A substance having a single unit structure. 1. monomer
2. A substance with numerous units joined together. 2. polymer
3. Process of monomers joining together to form a polymer. 3. Polymerization
4. A natural monomer. 4. Glucose
5. A natural polymer of glucose. 5. Sucrose
6. A plastic which does not stick while cooking. 6. Teflon
7. Plastic which is a poor conductor of heat and used for making handles of cooking utensils. 7. Bakelite (Thermoset)
8. Plastic which resists fire and used for coating firemen's uniform. 8. Melamine
9. A synthetic fabric which is suitable for summer wear. 9. Acrylic
10. Plastic used to spray on wood for protection from sun and rain and give a shine to it. 10. Polyurethane
11. Name a fibre which is more of cellulose and less of plastic. 11. Rayon

A. Short answer type questions

1. Name a fibre that:

- (a) burns with a flame giving out smell like that of burning paper. (b) burns with a flame emitting smell of burning hair.
(c) burns with a sooty flame leaving behind a black beady mass. Ans: a. cotton b. wool c. nylon

2. How thermoset is different from thermoplastic?

Ans: Thermoset Plastics are hard and rigid. Example is Teflon, Bakelite and melamine. Thermoset plastic can be moulded to any shape only once and cannot be remoulded.

Thermoplastics are soft and flexible though they are not elastic like rubber.

3. Why are plastics called polymers?

Plastics are called polymers as they are made up of many small units which joined together.

A substance having a single unit (molecule) structure is called a monomer (mono means single; mer means a unit). A substance made up of many (poly) units joining together is known as a polymer.

4. Why do we find sparks between our body and the polyester (terylene) shirt while taking it off?

Plastics may develop static electric charge upon them when rubbed against our body or with any other fibre. When opposite charges come into contact produce electric spark. So we found sparks jumping between our body and the polyester shirt while taking it off

5. Which property of acrylic makes it suitable for use as synthetic wool?

Ans: Acrylic fibres are highly soft, lightweight and thermal insulator which makes it suitable for use as synthetic wool

6. Give two uses of acrylic.

Ans: Acrylic is used for making synthetic wool, fur, blankets and fibre for filling pillows and quilts.

Acrylic sheets are extremely strong and are used as box or window panes in place of glass

7. Why rayon is also called artificial silk?

Rayon fibre is prepared on treating it chemically from cellulose obtained from cotton, soft wood (wood pulp) and other vegetable matter. Rayon gives a silk like feeling and appearance hence it is also called artificial silk.

8. You may break a cotton thread by pulling its two ends apart with your hands but not a thread made from nylon.

Why?

Ans: Nylon is the strongest synthetic elastic material which resists stretching. Cotton is a natural soft fibre which on pulling apart easily breaks.

9. What do the following stand for: (give one use of each) LDPE, PP, PVC, PS, PTFE, PU, PET, HDPE

Ans: LDPE stand for Low-density polyethylene used for making carry bags, buckets, squeeze bottles, bowls and packaging material.

PP stands for polypropylene and is commonly used for making transparent containers, water pipes and pipe fittings.

PVC stands from Polyvinyl Chloride and is commonly used for plumbing materials, furniture, doors, shoes, soft toys, gramophone records, CDs, raincoats, bathroom curtains, handbags and insulating electric cables (wires).

PS stands from polystyrene and is used for making kitchenware and thermocol.

PTFE stands from poly-tetra-fluoro-ethylene (also termed as Teflon) and is used as a coating on nonstick cookware.

PU stands for Polyurethane and is used as insulation in buildings, coating wooden fixtures for protection from heat and rain, providing false ceiling and inner linings in airplanes.

PET stands for Polyethylene terephthalate and is used for making containers for display of sugar, salt, spices, dry fruits, biscuits and toffees.

HDPE stands for High Density Polyethylene and it is used for making roof top water storage tanks.

10. What are the properties of plastic which has made it more useful material?

Ans: Plastic can be moulded into any desired shape without breaking the material. Plastics have light weight, durable, High tensile strength, air and water resistant . All these properties made plastics more useful materials. The raw materials for plastics production are easily obtained from petroleum.

B. Long answer type questions.

1. What are the disadvantages of using plastic in day to day life?

Ans: Following are the disadvantages of using plastic in day to day life

(i) Plastic is a poor absorber of moisture, hence fabric made from plastic is not considered good for use as garments.

(ii) Plastic may melt on heating and catch fire on further heating. it melts and sticks to the skin and causes severe burns.

(iii) Plastic is non-biodegradable so it causes soil and water pollution

(iv) On burning, it emits foul smell and poisonous fumes into the atmosphere causing air pollution.

2. Why should housewives not wear synthetic wear while working on a stove in the kitchen?

Ans: Synthetic fiber melt on heating. If they catch fire, they melt and stick to the body of the person wearing them. This is why it is advised not to wear clothes made of synthetic fiber while working in a kitchen.

3. How do natural fibres differ from synthetic fibres with respect to

Ans: Properties	Natural fibres	Synthetic fibres
(a) crease resistant	no	yes
(b) tensile strength	High	Low
(c) electrical insulation	poor	good
(d) moisture absorbent	Good	poor

4. Describe the process of making rayon.

Ans: Cellulose is treated chemically to change it and draw silk-like long and strong rayon fibre in two different ways:

1. Viscose process: Cellulose obtained from different plant sources is made into pulp and is turned into a thick viscous liquid by soaking it into alkaline solvents like sodium hydroxide.

This viscous liquid, thus obtained, is dried into sheets. Sheets are broken into small pieces . These small pieces are treated with carbon disulphide and dissolved in ammonia solution to prepare a thick viscous (viscose) solution.

Viscose solution is forced to pass through fine holes of spinneret and dropped directly in the dilute sulphuric acid.

Viscose liquid settles immediately into a long and fine filament. Filament turns white and is taken out of acid after 24 hours, dried and cleaned to obtain rayon fibre on a spool.

2. Acetate process : cellulose are treated with acetate to turn it into rayon. The product obtained was not good hence it did not become popular and was dropped.

Thinking Skill

1. After going through this lesson on synthetic fibre would you like to

(a). Wear a cotton shirt or a polyester shirt during summer? Why?

Ans: We wear cotton cloths as it absorbs sweat and circulates air.

(b) Will a shirt made of rayon fibre be acceptable to you in summer?

Ans: No, it does not absorb heat

(c) Would you like to throw away the potato chip packet (sachet) after enjoying the feast of chips on the road? If not where would you like to dispose of it?

Ans: No, Plastic is non-biodegradable

2. Black plastic handle on an electric kettle with water boiling in it doesn't get hot. Why?

Ans: Plastics are insulators of heat.

3. Is it healthy to use soft plastic toys for babies?

Ans: No, it is toxic