पु॰ना International School

Shree Swaminarayan Gurukul, Zundal

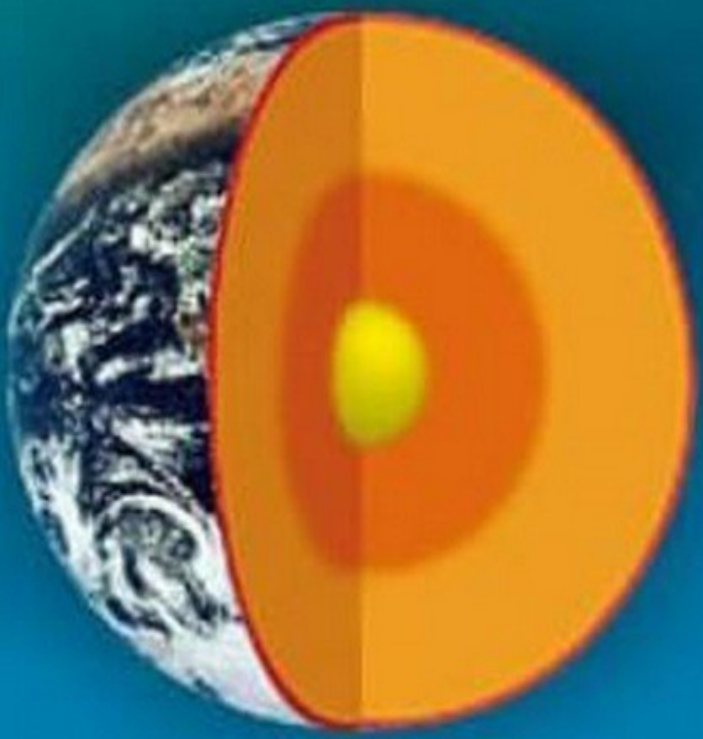
Class -VIII

Science

Year- 2020-21

SCIENCE

Textbook for Class VIII



Science

Class VIII

NCERT

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Chapter – 3

Synthetic Fibres and Plastics

❖ key words :-

(i) **Rayon:** It is made from cellulose obtained from wood pulp. It is used to make containers, car upholstery, etc.

(ii) **Nylon:** A polyamide made from petroleum. It is lightweight, strong and durable. The fabric allows easy evaporation and dries quickly. It is used in parachutes, flak vest, combat uniforms, tires, etc.

(iii) **Polyester:** A versatile and important man-made fabric. It has an outstanding characteristic of resisting wrinkle and springing back into its crisp, smooth shape. It is strong and soft. It is used in dresses, suits, rainwear, etc.

(iv) **Acrylic:** A fibre similar to that of wool and is used to make sweater, blankets, shawls, etc. It is lightweight, soft and warm. Also it is cheaper than natural wool. It is resistant to chemicals, moths and sunlight. Therefore, they are widely in use nowadays

(v) Plastics: Like synthetic fibres, plastic is also a polymer. Some plastics have a linear arrangement of the units and some have a cross-linked arrangement of the units. Examples: Polythene. Today, life without plastics cannot be imagined. Be it home, or outside, plastic is every where.

- **Extra Questions:-**
- **Very short Answer Questions:-**

1. Cotton is a natural polymer. What is its chemical name?

Ans. Cellulose

2. A synthetic fiber which looks like silk is obtained by chemical treatment of wood pulp. It is, therefore, known as artificial silk. What is its common name?

Ans. Rayon

3. Terrycot is made by mixing two types of fibres. Write the names of the fibres.

Ans. Terylene and cotton.

- **short Answer Questions:-**

1. A bucket made of plastic does not rust like a bucket made of iron. Why?

Ans. Plastic is a non-reactive material. It does not react with air and water and thus does not rust.

2. Rohit took with him some nylon ropes, when he was going for rock climbing. Can you tell why he selected nylon ropes instead of ropes made of cotton or jute?

Ans. Nylon ropes are strong, elastic and lighter as compared to cotton and jute ropes.

3. Why is it not advisable to burn plastic and synthetic fabrics?

Ans. Burning of plastic and synthetic fabrics produces lots of poisonous gases causing air pollution.

4. Plastic is used for making a large variety of articles of daily use and these articles are very attractive. But it is advised to avoid the use of plastic as far as possible. Why?

Ans. It is advised to avoid the use of plastic as far as possible as plastis is non biodegradable material which causes environmental problems and health risks.

- **Long Answer Questions:-**

1. Write the importance of synthetic polymers in our life.

Ans. Synthetic polymers have become very important in our lives. They are used in clothing, home furnishings, industrial use etc. Synthetic polymer like rayon, nylon, polyester are used for making clothes and accessories.

Nylons for making umbrellas, leegings, raincoats, curtains etc

Polyester are used fir making sarees , shirts and polyester when combined with natural fibres makes wrinkle free fabric which is very much on demand these days.

PET (Polyethylene terepthanene) a type of polyester are used fo making bottles and containers which are durable, flexible, light weight and also relatively inexpensive.

Plastics also a type of polymer are widely used material today. They are used in making electrical and electronic components, parts of vehicles, packaging industries,toys etc

Terylene a variety of polyester are also used to make fabric by mixing with other fabrics.

Exercises:-

1. Explain why some fibres are called synthetic.
Ans: Since man-made fibres are obtained by the synthesis of petrochemicals, so they are called synthetic fibres.

2. Mark (✓) the correct answers :
Rayon is different from synthetic fibres because
(a) It has a silk like appearance.
(b) It is obtained from wood pulp.
(c) Its fibres can also be woven like those of natural fibres.

Ans: (b) it is obtained from wood pulp.

3. Fill in the blanks with appropriate words :
(a) Synthetic fibres are also called _____ or _____ fibres.
(b) Synthetic fibres are synthesized from raw material called _____
(c) Like synthetic fibres, plastic is also a _____ .

Ans: (a) Synthetic fibres are also called **artificial** or **man-made** fibres.
(b) Synthetic fibres are synthesized from raw material called **polymer**.
(c) Like synthetic fibres, plastic is also a **petrochemicals**.

4. Give examples which indicate that nylon fibres are very strong.
Ans: They are used to make parachutes and ropes for rock climbing.

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

Ans: The main advantages of using plastic for storing food are -
a. Plastic has light weight.
b. Good strength.
c. Easy to handle.

6. Explain the difference between thermoplastic and thermosetting plastics.

Ans:

Thermoplastic	Thermosetting plastics
(i) These are the plastics which become soft on heating; they can be melted repeatedly by heating.	(i) These are the plastics which do not become soft on being exposed to moderately high temperatures.
(ii) These are used for making toys, combs and various types of containers.	(ii) Used for making electrical switches and handles of various utensils.
(iii) Ex- polythene, PVC, polystyrene, etc.	(iii) Ex- Bakelite, melamine etc.

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7. Explain why the following are made of thermosetting plastics.

(a) Saucepan handles
(b) Electric plug/ switches /plug boards

Ans: (a) Saucepan Handles: Saucepan handles are made from the thermosetting plastics because these are bad conductors of heat. They do not bend or deform on heating.

(b) Electric plug/Switches/Plug Boards: Electric plug/switches/plug boards are made from thermosetting plastics because thermosetting plastics are bad conductor of heat and electricity also. Hence it is used to make such articles.

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.

Cannot be recycled	Can be recycled
Telephone instruments	Plastic toys
Cooker handles	Plastic chairs
Electrical switches	Carry bags
	Plastic covering on electrical wires
	Ball point pens
	Plastic bowls

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. Cotton is a good absorber of water. So it can absorb sweat produced by the body and exposes it to the environment. The sweat therefore evaporates which cools the body. But clothes made from synthetic material cannot absorb sweat and therefore cannot produce the cooling effect of cotton. Hence, Rana should buy cotton shirts.

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

Ans. Plastics are non-reactive in nature, even with strong chemicals. Hence, they don't get corroded and are therefore non-corrosive in nature.

For example:

(1)Phenyl or acids, used for household work are stored in plastic bottles.

(2)Buckets, bottles etc. don't react with water stored in them.

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

Ans. No.

In a toothbrush, the handle should be hard and strong, so that it doesn't break while bristles should be soft and flexible. Hence, handle should be made up of plastic while bristles should be made from nylon.

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

Ans. Due to the following reasons, plastics should be avoided:

(1)They are non-biodegradable. Hence, they take hundreds of years to decompose.

(2)If they are burnt, poisonous gases are released which pollute the environment.

(3)Plastic dumps in the oceans affect marine life and can cause death of marine animals.
(4)Plastic dumps on land can also be fatal. Animals can swallow them and the plastic can choke their respiratory system.

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

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

Ans.

(i)	Polyester	(d)	Fabrics do not wrinkle easily

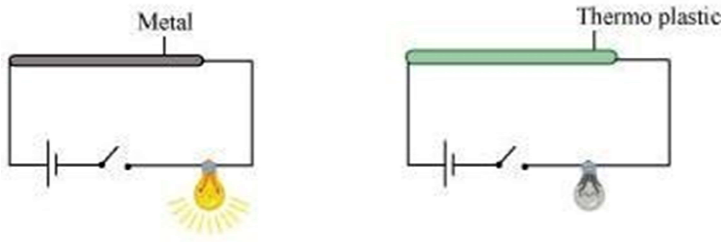
(ii)	Teflon	(c)	Used to make non-stick cookware
(iii)	Rayon	(a)	Prepared by using wood pulp
(iv)	Nylon	(b)	Used for making parachutes and stockings

14.'Manufacturing synthetic fibres is actually helping conservation of forests'. Comment.

Ans. Natural fibres are mainly obtained from plants and trees. Hence, to obtain them, we need to cut down trees which eventually leads to deforestation. But synthetic fibres are made using petrochemicals. Therefore, there will be no need of deforestation. So we can say that 'Manufacturing synthetic fibres is actually helping conservation of forests'.

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

Ans. To show that thermoplastics are bad conductor of electricity, we can design a circuit with some wires, bulb, battery, a metal piece and a PVC pipe (PVC is a thermoplastic material) as shown in the figures.



In the first case, we will have a metal piece as shown in the figure. We can notice that the bulb will glow.

While in the second case, we will use a PVC pipe instead of a metal piece. We will notice that the bulb will not glow this time.

Hence, from this experiment we can say that “Thermoplastics are bad conductor of electricity”.

CHAPTER 4
Materials: Metals and Non-Metals

❖ key words :-

1.Metal :-Metal are those element which are likely to loose their electron

2. Non metal :-non metal are those element which are likely to gain electron.

3 displacement reaction:-.A **displacement reaction**, is a chemical reaction in which one (or more) element(s) replaces an/other element(s) in a compound. It can be represented generically as:

$$A + B\text{-}C \rightarrow A\text{-}C + B$$

❖ Extra Questions:-

❖ Very short Answer Questions:-

1. Name two soft metals which can be cut with a knife.

Ans. (i) sodium (ii) potassium

2. Which non-metal is essential for our life and all living beings inhale it during breathing?

Ans. Oxygen gas

3. Name two major non-metals which are present in fertilisers and enhance the growth of plants.

Ans. (i) nitrogen (ii) phosphorus

4. Which non-metal is used to disinfect water?

Ans. Chlorine

❖ short Answer Questions:-

1. Why are bells made of metals?

Ans. Bells are made of metal because metals are sonorous(produce sound while strick on it).

2. Which liquid metal is used for making thermometers?

Ans. Mercury

3. Which of the following metals can displace the other two metals from their salt solutions?

zinc, iron, copper

Ans. Zinc

23. In Fig 4.1 you find that the bulb glows when an iron nail is placed between two ends of wire. Complete the following sentences on the bases of this fact.

Fig 4.1

(a) _____ is a metal.

(b) Metals are good _____ of electricity.

Ans. (a) iron (b) conductor

❖ long Answer Questions:-

1. Some of the following statements are incorrect. Find the incorrect statements and correct them.

(a) The property of metals by virtue of which they can be drawn into wires is called ductility.
(b) Metals are good conductor of electricity but poor conductor of heat.

(c) Articles made of metals produce ringing sound when struck hard.
(d) Oxides of non-metals and metals are acidic in nature.
(e) A less reactive metal replaces a more reactive metal from its salt solution in water.

Ans. Statements (b), (d) and (e) are not correct.
(b) Metals are good conductor of electricity and also good conductor of heat.
(d) Oxides of non-metals are acidic in nature while oxides of metals are basic in nature.
(e) A more reactive metal replaces a less reactive metal from its salt solution in water.

Exercises:-

1. Which of the following can be beaten into thin sheets?

(a) Zinc (b) Phosphorus (c) Sulphur (d) Oxygen

Ans. (a) Zinc

2. Which of the following statements is correct?

(a) All metals are ductile.

(b) All non-metals are ductile.

(c) Generally, metals are ductile.

(d) Some non-metals are ductile.

Ans. (c) Generally, metals are ductile.

3. Fill in the blanks.

(a) Phosphorus is a very _____ non-metal.

(b) Metals are _____ conductors of heat and _____.

(c) Iron is _____ reactive than copper.

(d) Metals react with acids to produce _____ gas.

Ans. Fill in the blanks.

(a) Phosphorus is a very **reactive** non-metal.
(b) Metals are **good** conductors of heat and **electricity**.
(c) Iron is **more** reactive than copper.
(d) Metals react with acids to produce **hydrogen** gas.

4. Mark 'T' if the statement is true and 'F' if it is false.

(a) Generally, non-metals react with acids. ( )

(b) Sodium is a very reactive metal. ( )

(c) Copper displaces zinc from zinc sulphate solution. ( )

(d) Coal can be drawn into wires. ( )

Ans. Mark 'T' if the statement is true and 'F' if it is false.

(a) Generally, non-metals react with acids. (F)

(b) Sodium is a very reactive metal. (T)

(c) Copper displaces zinc from zinc sulphate solution. (F)

(d) Coal can be drawn into wires. (F)

5. Some properties are listed in the following Table. Distinguish between metals and non-metals on the basis of these properties.

Properties	Metals	Non-Metals
1. Appearance		
2. Hardness		
3. Malleability		
4. Ductility		
5. Heat conduction		
6. Conduction of Electricity		

Ans.

Properties	Metals	Non-Metals
1. Appearance	Shiny	Dull
2. Hardness	Very hard	Hard or Soft
3. Malleability	Can be beaten into thin sheets	Can not be beaten into thin sheets
4. Ductility	Can be drawn into wires	Can not be drawn into wires
5. Heat conduction	Good conductors of heat	Poor conductors of heat
6. Conduction of Electricity	Good conductor of electricity	Poor conductors of electricity

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6. Give reasons for the following.

(a) Aluminium foils are used to wrap food items.

(b) Immersion rods for heating liquids are made up of metallic substances.

(c) Copper cannot displace zinc from its salt solution.

(d) Sodium and potassium are stored in kerosene.

Ans. (a) Aluminium is one of the least reactive metals, so it does not react with food items and does not alter the taste. Moreover, being a metal; aluminium is highly malleable and can be made into very thin foils which are perfect for wrapping food.

(b) Immersion rods for heating liquids are made up of metallic substances because metals are good conductors of heat and electricity. The immersion rod needs electric supply to get heated and in turn to heat liquids.

(c) A metal can displace a less reactive metal from its salt in an aqueous solution. But zinc is more reactive than copper. Therefore, copper cannot displace zinc from its salt solution.

$Cu(s) + ZnSO_4(aq) \rightarrow$ No reaction

(d) Sodium and potassium are highly reactive metals. If kept in open, they readily react with oxygen in the atmosphere. The reaction is so quick and that sodium and potassium easily catch fire when exposed to air. To prevent accidental fire, they are stored in kerosene.

7. Can you store pickle in an aluminium utensil? Explain.

Ans. Aluminium is a metal. Metals are more reactive with acids. So acidic foodstuffs like lemon pickles can not be stored in aluminium utensils.

8. Match the substances given in Column A with their uses given in Column B.

A	B
(i) Gold	(a) Thermometers
(ii) Iron	(b) Electric wire
(iii) Aluminium	(c) Wrapping food
(iv) Carbon	(d) Jewellery
(v) Copper	(e) Machinery
(vi) Mercury	(f) Fuel

Ans.

Column A	Column B
(i) Gold	(d) Jewellery
(ii) Iron	(e) Machinery
(iii) Aluminium	(c) Wrapping food
(iv) Carbon	(f) Fuel
(v) Copper	(b) Electric wire
(vi) Mercury	(a) Thermometers

9. What happens when

(a) Dilute Sulphuric acid is poured on a copper plate?
(b) Iron nails are placed in copper sulphate solution?

Write word equations of the reactions involved.

Ans. (a) (a) When dilute sulphuric acid is poured on a copper plate, bubbles appear on the surface of plate. This happens because sulphuric acid reacts with copper to produce hydrogen gas. This can be shown by following equation:
Sulphuric acid(Dilute) + Copper → Copper sulphate + Hydrogen (gas)

(b) When iron nails are placed in copper sulphate solution, the blue colour of copper sulphate solution fades and turns into light green. This happens because iron displaces copper from copper sulphate solution. This can be shown by following equation:
Copper sulphate + Iron → Iron sulphate + Copper

10. Soloni took a piece of burning charcoal and collected the gas evolved in a test tube.(a) How will she find the nature of the gas?

(b) Write down word equations of all the reactions taking place in this process.

Ans. (a) For this, the evolved gas should be passed into a test tube which is filled with lime water. If the lime water turns milky, it shows that the evolved gas is carbon dioxide.gas.

(b) Carbon + Oxygen → Carbon dioxide + Heat.

11. One day Reeta went to a jeweller's shop with her mother. Her mother gave an old gold Jewellery to the goldsmith to polish. Next day when they brought the Jewellery back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight?
Ans. The goldsmith use a mixture of acids to clean jewellery. Gold usually doesn't react with acids. But the mixture which is used by goldsmith is Aqua regia which can even dissolve gold. Due to this, some gold is lost during the polishing process.