



INDIAN SCHOOL AL WADI AL KABIR



Class: VIII	Department: SCIENCE 2022 - 23	Date: 10.05.2022
Worksheet No.: 2 WITH ANSWERS	Topic: SYNTHETIC FIBRES AND PLASTICS	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

I. VERY SHORT ANSWER (1M)

- 1) Define polymer
[Hint: Polymers are compounds that are made up of the same, small repeating units, joined together through bonds in a linear pattern.]
- 2) Name two polyester fabrics and their uses. [Hint: Terylene and PET are two widely used polyester fabrics. Terylene is used to make very fine yarn by which various dress materials are made. PET is one of the familiar forms of polyester that is used to make bottles, utensils, wires and many other things]
- 3) Why should we use a cotton carry bag or jute bag while going to market?
[Hint: We should use cotton or jute bags while going to the market to minimise the use of plastic bags, as they are non-biodegradable and not environmentally friendly.]
- 4) What is Terylene?
[Hint: Terylene is an artificial textile fibre made from polyester, it is used to make light, crease-resistant clothing, bed linen, and sails.]
- 5) Define synthetic fibres. [Hint: Fibres made by human beings or man-made fibres are called synthetic fibres]
- 6) Explain the first "fully synthetic fibre".
[Hint: The first fully synthetic fibre was nylon. It was prepared from coal, water and air. It is very strong, elastic and light, it is very easy to wash and used for making a variety of things like socks, ropes, bags, curtains, parachutes etc.]
- 7) What is cellulose?
[Hint: Cellulose is a polymer made up of a large number of glucose units.]
- 8) What are esters? **Hint:** Esters are the chemicals which give fruits like smell.

9) Define petrochemicals.

[Hint: All the synthetic fibres are prepared by a series of processes using raw materials that are of petroleum origin .Many useful substances that are obtained from petroleum and natural gas are termed as petrochemicals.]

10) Why are plastic articles available in all shapes and sizes?

[Hint: Because of the very important property of plastic i.e. it can be easily mouldable and shaped in any form.]

For questions 11,12 and 13, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below

i)Both A and R are true and R is the correct explanation of assertion.

ii)Both A and R are true but R is not the correct explanation of assertion.

iii) A is true but R is false.

iv) A is false but R is true

11) **Assertion-** Acrylic fibres are used in making socks and shawls.

Reason- Acrylic fibres are a replacement for woollen fibres. It is cheaper and can be dyed in different colours.

Ans: i) Both assertion and reason are true and the reason is the correct explanation of assertion.

12) **Assertion-** Bakelite is used for making electrical switches and handles of various utensils.

Reason- Bakelite is a thermosetting plastic. It is a poor conductor of both heat and electricity.

Ans: i) Both A and R are true and R is the correct explanation of assertion.

13) **Assertion-Rayon** is called artificial silk.

Reason- Raw materials used to prepare rayon are coal, air and water.

Ans: ii) A is true but R is false.

II. **a. CASE STUDY BASED QUESTIONS**

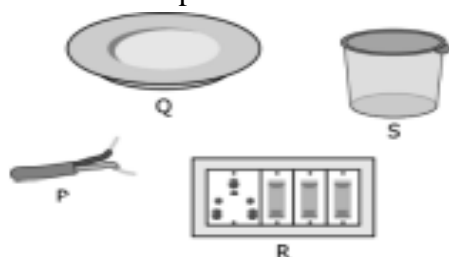
Shikhar puts some hot water in an empty plastic bottle and a plastic bowl used in the kitchen. He observes that the bottle gets deformed while the plastic bowl remains the same. He asked the reason to his science teacher. The teacher explained that such plastic which gets deformed easily on heating and can be bent easily is known as thermoplastics. Polythene and PVC are some examples of thermoplastics. These are used for manufacturing toys, combs and various types of containers. There are some plastics which when moulded once, cannot be softened by heating. These are called thermosetting plastics. Two examples are Bakelite and melamine. Bakelite is a poor conductor of heat and electricity. It is used for making electrical switches, handles of various utensils, etc.

Melamine is a versatile material, it resists fire and can tolerate heat better than other plastics. It is used for making floor tiles, kitchenware and fabrics which resist fire.

i) Based on the observation, what can be said about the bottle or the bowl?

- a) Both the plastic bowl and plastic bottle are thermoplastic.
- b) Both plastic bowls and plastic bottles are thermosetting plastic.
- c) Plastic bowl is a thermoplastic while a plastic bottle is a thermosetting plastic.
- d) **Plastic bowl is a thermosetting plastic while a plastic bottle is a thermoplastic**

ii) The image shows some products that are made up of different types of plastics.



Which products are correctly matched with the type of plastic?

- a) **Q and R- thermosetting plastic**
- b) P and Q- Thermosetting plastic
- c) R and S- Thermoplastic
- d) S and Q- Thermoplastic

iii) The uniform of firemen is made up of synthetic fibres and has a coating of melamine plastic. What is the likely characteristic that melamine plastic has that makes it ideal to make uniforms for firemen?

- a) **It resists fire and can tolerate heat.**
- b) It is a good conductor of heat.
- c) It absorbs all the heat.
- d) It reflects all the heat.

iv) In chemical laboratories, many salts like ammonium nitrate are stored in plastic containers instead of metals. What can be a likely reason for the same?

- a) **Plastic does not react with other substances.**
- b) Plastic is less expensive than metal.
- c) Plastic is easier to handle than metal.
- d) Plastic gets rusted in the presence of air

III.PASSAGE BASED QUESTIONS:

Read the following passage and answer the questions-

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 non-biodegradable. Since plastic takes several years to decompose, it is not environmentally friendly. It causes environmental pollution. Besides, the burning process in the synthetic material is quite slow and it does not get completely burnt easily. In the process, it releases lots of poisonous fumes into the atmosphere causing air pollution. How can this problem be solved? Avoid the use of plastics as far as possible. Make use of bags made of cotton or jute when you go shopping. The biodegradable and non-biodegradable wastes should be collected separately and disposed of separately. The polybags are carelessly thrown here and there and are responsible for clogging the drains, too. Sometimes we are very careless and throw the wrappers of chips, biscuits and other eatables on the road or in parks or picnic places. As a responsible citizen remember the 4 R principle. Reduce, Reuse, Recycle and Recover. Develop habits which are an environment friendly

- i) To which of the following does the 4R principle apply the most?
 - a) Synthetic fibre
 - b) Natural fibre
 - c) Metal
 - d) **Plastic**
- ii) How does the burning of synthetic polymers such as plastic pollute the environment?
 - a) **By releasing smoke and toxic gases**
 - b) By releasing water vapour and haze
 - c) By releasing water vapour and smoke
 - d) By forming smog and rain
- iii) What is the best method to avoid pollution by using plastic bags?
 - a) Burying the plastic bags in the soil.
 - b) **Using bags made of biodegradable material.**
 - c) Throwing the plastic bags into the river.
 - d) Burning the plastic bags in a rubbish dump.
- iv) Which of the given type of waste is non-biodegradable waste?
 - a) Paper bags
 - b) Woollen clothes
 - c) **Plastic bags**
 - d) Leftover foodstuff

IV a) SHORT ANSWER TYPE QUESTIONS (2M):

1. A bucket made of plastic does not rust like a bucket made of iron. Why??
[Hint- Plastic is a non-reactive material. To form rust it should react with water and oxygen. Since plastic is a non-reactive material it does not form rust.]

2. Differentiate:

a) Thermosetting plastics and thermoplastics with examples

S.NO.	Thermosetting plastic	Thermoplastic
(i)	Thermosetting plastic cannot be bent easily. It may break when forced to bend.	Thermoplastic can be bent easily
(ii)	Thermosetting plastic cannot be softened by heating. Thus, it cannot be reshaped once moulded.	Thermoplastic can be softened easily by heating. Thus, it can be reshaped.

b) Natural fibres and Synthetic fibres with examples.

S.NO.	Natural fibres	Synthetic fibres
(i)	These fibres are naturally obtained from plants and animals.	These fibres are made by men in factories.
(ii)	For example, cotton, silk, etc.	For example, rayon, polyester, etc.

c) Biodegradable substances and non-biodegradable substances

S.NO.	Biodegradable resources	Non-biodegradable resources
1.	The substances which get degraded to their simpler and harmless substances over some time are known as biodegradable.	The substances which do not get degraded to their simpler and harmless substances over some time are known as non-biodegradable.
2.	They are not harmful to animals and plants. Eg: cow dung, leaves, paper, etc.	They are harmful to plants and animals. Eg: DDT, plastic, polyethene, etc.

4. What are plastics? Why is it not advisable to burn plastic and synthetic fabrics?

[Hint: Plastics are those substances which are mostly synthetic, obtained mainly from petrochemical sources and can be moulded into different shapes.

The burning of plastic releases toxic gases which pollutes the air. Hence it is not advisable to burn plastic and synthetic fabrics.]

5. 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?

[Hint: Plastic is not biodegradable and disposing of plastic waste is a major issue. Hence it is advised to avoid the use of plastic as far as possible.]

IV. b) SHORT ANSWER TYPE QUESTIONS (3 M):

1. List any three properties of plastics.

[Hint: The three properties of plastics are:

They are non-corrosive, they are light in weight and durable, and they do not conduct heat].

2. Give reasons for the following:

- a) Nylon is very popular for making clothes.

[Hint: Nylon fibres are strong, elastic and light. It is lustrous and easy to wash. So, it became very popular for making clothes.]

- b) Frying pan handles are made up of thermosetting plastics.

[Hint: Frying pan handles are made with thermosetting plastics which are resistant to fire and can tolerate heat better than other plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity.]

- c) Plastic containers can be used to store many chemicals.

[Hint: Plastic bottles are commonly used to store chemicals in a chemistry laboratory because plastics are non-reactive that is they don't react with other substances/ chemicals.]

- d) Melamine is a versatile material.

[Hint: Melamine is a versatile material. It resists fire and can tolerate heat better than other plastics. It is used for making floor tiles, kitchenware and fabrics which resist fire.]

- e) PET bottles are preferred in kitchens today over glass bottles.

[Hint: Plastic is much lighter and more durable than glass. This makes it cheaper and easy to transport. Additionally, plastic is more flexible than glass, making it easier to be moulded which enables brands to build identity.]

3. Observe the figure and answer the questions that follow:

- a) Identify the articles given in figures A and B.

- b) Name the substance used in making these articles and why?



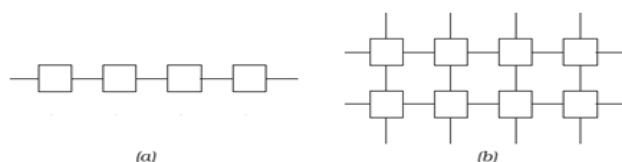
[Hint a-A- Rope, B- parachute, b- Nylon, it is strong, has high tensile strength]

- c) Why are we advised not to wear synthetic clothes while working in the kitchen?

[Hint: Catch fire easily, will melt and stick to the body.]

4. What do the following figures represent? Explain their differences.

[Hint: Linear and cross-linked arrangements in plastic]



[The main **difference between linear polymers** and **cross-linked polymers** is that **linear polymers** are straight-chain structures whereas **cross-linked polymers** are branched chain structures.]

5. Give two uses each of rayon, polyester, and acrylic.

[Hint: Rayon is used in the textile industry for making fabrics . Rayon is also used for making tyre cords, carpets and surgical dressings.

Polyester fibres are widely used in the textile industry for making a variety of fabrics such as sarees, dress materials, curtains, etc. They are also blended with natural fibres such as cotton and wool. It is also used for making sails of sailboats.

Acrylic is used to make sweaters and shawls. It is also used to make car tops and boat covers. It is used to make filtration materials and car batteries.]

V.LONG ANSWER TYPE QUESTIONS (5 M):

1. Mention the characteristics of synthetic fibres and a major disadvantage of synthetic fibre.

[Hint: **synthetic fibres** are cheaper than natural **fibre**.

- **Synthetic fibres** are stronger than natural **fibre**.
- **Synthetic fibres** are more durable than natural **fibre**.
- **Synthetic** fabrics are dried up in less time.
- **Synthetic fibres** are easy to maintain and wash.

Disadvantages

- They easily melt and burn to form small sticky beads at a very high temperature.
- , Unlike natural fibres, they do not absorb sweat.
- They get electrically charged in dry weather.

2. List the strategies for plastic waste management.

[Hint: Some of the strategies for plastic waste management are:

- We should use paper bags and jute bags instead of using plastic bags.
- The government should ban the use of plastic bags.
- Plastics should be recycled to make other useful products which do not harm the environment.
- We should use special garbage bins to dispose of plastic wastes.
- We should not throw plastic wastes into water bodies.
- Practicing 4R's principle, i.e., Reuse, Recycle, Reduce and Recover should be encouraged.

3.a)What are blended fibres? Give some examples.

[Hint: Blended fibres are formed by mixing natural and synthetic fibres. Polyester is often used in blended fibres.

For Example,

- Polywool is made by mixing polyester and wool.
- Polycot is made by mixing polyester and cotton.
- Terrycot is made by mixing Terylene and cotton.]

b)Two beakers with equal amounts of water are taken. Equal pieces of cotton and polyester fabrics are soaked into two beakers. Both the fabrics are then dried in the sunlight.

- i) Which of the two beakers will have a lesser amount of water left in it when the fabric kept in it is taken out? (hint: The beaker with cotton fabric)
- ii) Which fabric will take lesser time to dry? Give reasons for your answer. (Polyester because it absorbs less water)
- iii) Manufacturing synthetic fibres is helping the conservation of forests. Comment. (Hint: reduced cutting of trees, reduced usage of various forest products.)

Prepared by: Ms. Ranjana.S.	Checked by: HOD - SCIENCE
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