Materials We Use

EXERCISE [PAGE 103]

Exercise | Q 1.1 | Page 103

Fill appropriate term in the blank:

The substance that helps water to remove dirt from the surface of materials is called_____

1. white cement
2. soap
3. **detergent**
4. wearing of bones
5. tooth decay
6. hard
7. soft
8. Portland
9. fatty acid

Solution: The substance that helps water to remove dirt from the surface of materials is called **detergent**.

Exercise | Q 1.2 | Page 103

Fill appropriate term in the blank:

Fluoride is used in toothpaste to prevent_____

1. white cement
2. soap
3. detergent
4. wearing of bones
5. **tooth decay**
6. hard
7. soft
8. Portland
9. fatty acid

Solution: Fluoride is used in toothpaste to prevent **tooth decay**.

Exercise | Q 1.3 | Page 103

Fill appropriate term in the blank:

Soap is a salt of _____ and sodium hydroxide.

1. white cement
2. soap
3. detergent
4. wearing of bones
5. tooth decay
6. hard
7. soft
8. Portland
9. **fatty acid**

Solution: Soap is a salt of **fatty acid** and sodium hydroxide.

Exercise | Q 1.4 | Page 103

Fill appropriate term in the blank:

Synthetic detergents can be used in _____ water as well.

1. white cement
2. soap
3. detergent
4. wearing of bones
5. tooth decay
6. **hard**
7. soft
8. Portland
9. fatty acid

Solution: Synthetic detergents can be used in **hard** water as well.

Exercise | Q 1.5 | Page 103

Fill appropriate term in the blank:

For construction purposes _____ cement is the most commonly used cement.

1. white cement

2. soap
3. detergent
4. wearing of bones
5. tooth decay
6. hard
7. soft
8. **Portland**
9. fatty acid

Solution: For construction purposes, **Portland** cement is the most commonly used cement.

Exercise | Q 2.1 | Page 103

Write an answer to the following question.

How does the use of detergent help to clean soiled clothes?

Solution: Detergent is a cleansing agent that combines with the impurities to make them more soluble and therefore wipe them away. A molecule of detergent consists of two ends. One of its ends is attracted to the water while the other holds on to the dirt. This results in the mixing of dirt and water. Due to the ability to get attached to both oil and water, the detergent molecule spreads easily. This property of a substance expanding on a surface is known as surface activity and the substance is known as surfactant. One of the effects of surface activity is lather formation.
This action of the detergent molecule results in the removal of dirt and stains from the clothes.

Exercise | Q 2.2 | Page 103

Write an answer to the following question.

How will you check with the help of soap powder whether water is hard?

Solution: Soap can be used to check whether a sample of water is hard or soft. Soaps do not give lather with hard water instead form scum whereas they give lather with soft water. If we do not get lather in the water while using soap, we can say it is hard water.

Exercise | Q 2.3 | Page 103

Write an answer to the following question.

What are the important ingredients of toothpaste, and what is the function of each?

Solution: The important ingredients of toothpaste are abrasives, water, and fluoride. Abrasives such as calcium carbonate and calcium hydrogen phosphates help to remove the dirt on teeth and also helps to polish them. Fluoride is the most common active ingredients used to prevent decay of our teeth. It helps in strengthening bones and the enamel which covers the teeth.

Exercise | Q 2.4 | Page 103

Write an answer to the following question.

What are the ingredients of cement?

Solution: The ingredients of cement are lime (CaO), clay, silica along some other oxides of aluminum, iron, and magnesium. Gypsum ($CaSO_4$, $2H_2O$) is usually added to regulate the setting rate of cement.

Exercise | Q 2.5 | Page 103

Write an answer to the following question.

What will happen if cement is not used in making concrete?

Solution: Concrete is a mixture of cement, water, sand, and gravel. Cement helps in making the structures strong and leak proof. If cement is not mixed in concrete, the structures made using concrete will not be strong and leakproof and thus will have the chances of falling down.

Exercise | Q 2.6 | Page 103

Write an answer to the following question.

Make a list of detergents that you use.

Solution: The detergents which we use in our daily lives are-

- ritha and shikhakai for washing hair
- soaps like Dettol, dove, lifebuoy, etc. for bathing
- detergents like surf excel, tide, etc. for washing clothes

Exercise | Q 2.7 | Page 103

Write an answer to the following question.

What should be expected from detergent for delicate garments?

Solution: A delicate detergent should clean the clothes effectively without affecting the quality of the clothes. It should have the ability to remove all kinds of stains without causing any harm to the clothes.

Exercise | Q 2.8 | Page 103

Write an answer to the following question.

What is meant by 'surface activity'?

Solution: The surface activity of a substance is the property by virtue of which it can spread on a surface. For example, soap water easily spreads on any kind of surface and thus is used for cleaning purposes.

Exercise | Q 2.8 | Page 103

Write an answer to the following question.

Name three chemicals responsible for the surface activity of various detergents.

Solution: Chemicals responsible for the surface activity of various detergents are alkylbenzene sulphonate, alcohol ethoxy sulphates and alkyl sulphates.

Exercise | Q 3.1 | Page 103

What are the similarities and differences between Natural detergents and man-made detergents?

Solution:

Natural detergents	**Man-made detergents**
1. Natural detergents refer to the substances which are naturally available and can be used as detergents.	Man-made detergents are detergents which have been made by humans for their use.
2. Examples of natural detergents include soap nut (ritha) and soap pod (shikhakai).	Example of man-made detergent is soap.

Exercise | Q 3.2 | Page 103

What are the similarities and differences between Soap and synthetic detergent?

Solution:

Soap	Synthetic detergent
1. Soaps are sodium salt of fatty acids (soft soap) or potassium salts of fatty acids (hard soap).	Synthetic detergents are made up of raw materials like fats or kerosene.
2. They can be used only with soft water.	They can be used with both soft and hard water.

Exercise | Q 3.3 | Page 103

What are the similarities and differences between Bath soap and soap for washing clothes?

Solution:

Bath soap	Soap for washing clothes
1. It is a type of soft soap and used for bathing purposes.	It is a type of hard soap and is used for washing clothes.
2. Soft soaps are sodium salt of fatty acids.	Hard soaps are potassium salts of fatty acids.

Exercise | Q 3.4 | Page 103

What are the similarities and differences between Modern cement and ancient cement?

Solution:

Ancient cement	Modern cement
1. It was developed by the Romans during the Roman empire.	It was developed by a British scientist, John Smeaton.
2. It was prepared by mixing volcanic ash in moistened lime.	It is made up of materials like lime (CaO), clay, silica along with some other oxides of aluminum, iron, and magnesium, and gypsum ($CaSO_4$, $2H_2O$).

Exercise | Q 4.1 | Page 103

Explain Why Soap cannot be used in hard water.

Solution: Soaps cannot be used in hard water because they lose their cleansing property when used with it. Soaps do not form lather with hard water and instead forms scum, as a result of which it loses its cleansing property.

Exercise | Q 4.2 | Page 103

Explain Why Oil does not mix in water. However, oil and water become homogeneous if a sufficient quantity of detergent is added.

Solution: Oil and water are two immiscible liquids which mean both of them to repel each other. But when we add detergent to a solution containing water and oil, the mixture becomes homogeneous. This happens because of the detergent molecule. The detergent molecules have two ends. One of its ends holds on to a water molecule and the other end holds on to the oil molecule. These opposing forces help in dissolving the oil in water and thus making a homogeneous mixture.

Exercise | Q 4.3 | Page 103

Explain Why Synthetic detergents are superior to soap.

Solution: Synthetic detergents are superior to soap because synthetic detergents work both in soft water and hard water. In contrast, soaps work only in soft water and they are not effective in hard water.

Exercise | Q 4.4 | Page 103

Explain Why Often coloured spots are formed on clothes during washing.

Solution: The laundry, skincare, beauty, and personal hygiene products that we use commonly can cause stains and color changes in our clothes. Toothpaste, perspiration, facial soap, deodorants, hair sprays, strong perfumes with alcohol, and even rain are often the cause of stains on garments. All these stains may eventually dry up not causing any visible stain however, age and exposure to heat will cause them to reappear.

Exercise | Q 4.5 | Page 103

Explain Why Tobacco masher should not be used for cleaning teeth.

Solution: Tobacco has various kinds of negative effects on our bodies. It should not be used for cleaning teeth because it can harm the soft and hard tissues of our mouth. The use of tobacco poses serious risks like oral cancer, gum disease, poor healing after surgery, receding gums, and tooth decay.