15. Materials we use

1. Fill oppropriate terms in the blanks.

(White cement, Soap, Detergent, Wearing of bones, Tooth decay, Hard, Soft, Portland, Fatty acid)

(i) The substance that helps water to remove dirt from the surface of materials is called..... .

Ans : Detergent

(ii) Fluoride us used in toothpaste to prevent..... .

Ans : Tooth decay

(iii) Soap is a salt of .....and sodium hydroxide.

Ans : Fatty acid

(iv) Synthetic detergents can be used in ..... water as well.

Ans : Hard

(v) For construction purposes..... cement is the most commonly used cement.

Ans : Portland.

2. Write whether the following statements are true or false.

(i) In the period prior to 500 Bc, in coutries such as China, Greece, Rome, toothpaste was made of mixing the powder of bones and shells.

Ans : True.

(ii) The first commercial toothpaste was made by the babool company in New York city in 1875.

Ans : False. The first commercial toothpaste was made by the Colgate company in New York city in 1873.

(iii) Soap is natural detergent.

Ans : False. Soap is man-made detergent.

(iv) Hard soap is used for washing clothes.

Ans : True.

(v) Cement is an important material in construction.

Ans : True.

(vi) In 1750, the British engineer, John Smeaton developed the method of making aqueous cement.

Ans : False. In 1756, the British engineer, John Smeaton developed the method of making aqueous cement.

3. Write answers to the following questions.

(1) How does the use of a detergent help to clean soiled clothes?

Ans : Detergents are used to clean the dirt and oily stains on the clothes. The molecules of detergent are long in their structure. This molecule holds on the a water molecule on one of its side and the oil molecule onto the other. Due to this the oil mixes with water. It can easily come out of cloth along with dirt. The soiled clothes thus become clean due to detergent.

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

Ans : The soap does not produce foam in hard water, due to the dissolved salts in the hard water. Thus by using soap powder we can understand if water is hard.

(3) What are the important ingredients of a toothpaste, and what is the function of each ?

Ans : The important ingredients of a toothpaste are calcium carbonate and calcium hydrogen phosphate. These substances

remove the dirt from the teeth. They also help to polish the teeth. Fluoride is also added to toothpaste. This prevents the tooth decay. Fluoride makes the enamel of the teeth strong.

(4) What are the ingredients of cement ?

Ans : The ingredients of simple cement are silica (sand), alumina (aluminum oxide), lime, iron oxide and magnesia (magnesium oxide). In Portland cement, there is 60% lime (calcium oxide), 25% silica (silicon dioxide), 5% alumina and remaining iron oxide and gypsum (calcium sulphate)

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

Ans : Concrete is prepared by mixing cement, water, sand and gravel. If cement is lacking in this mixture the construction work will not become rigid. Cement is useful in preventing leakage. A strong and leak proof slab is possible only due to high quality cement mixed in concrete. If cement is not used while making concrete, there will be leakage, the slabs and pillars will not be strong and the building will collapse.

(g) What should be expected from a detergent for delicate garment ?

Ans : Soap nut and soap pod are the best detergent for the delicate garments, as they do not have any harmful effect on delicate silk and woolen threads and cloth.

(7) What is meant by 'surface activity'? Name three chemicals responsible for the surface activity of various detergents.

Ans : The Property of a substance of spreading on a surface is called surface activity. The substances showing this property are called surfactant.

The chemicals added to detergents which make them surfactants are petroleum products such as kerosene, fats, sulphur trioxide, alcohol etc.

(8) What causes the hardness of water?

Ans : If the salt of calcium and magnesium such as bicarbonates, chlorides and sulphates are dissolved in the water, then there is hardness caused to the water.

(9) Now days, why are the roads made of concrete?

Ans : These days there is a very heavy traffic on the road. Therefore, there is need of strong roads that can support

speedy transport. Therefore nowadays, roads are made of concrete.

3. What are the similarities and differences between.

(a) Natural detergents and non-made detergents

Ans : Similarities : Both are used for cleaning

Natural detergents	Non-made detergents
1. Natural detergents are naturally present substances.	1. Man- made detergents are substances produced by man.
2. Natural detergents contain a chemical named saponin.	2. Man -made detergents contain additives such as perfumes, dyes, germicides, alcohol, anti-foaming agents, moisturizers, fine sand etc.
3. Natural detergents do not have any harmful effect on clothes or skin.	3. Man-made detergents may have harmful effects on skin and clothes.
4. Natural detergents do not cause pollution of water bodies. e.g., Soap nut with soap pod	4. Man-made detergents cause pollution of water bodies. e.g., Different synthetic detergents.

(b) Soap & synthetic detergent.

Ans : Similarities : Both are used for cleaning.

Soap	Synthetic detergent
1. Soaps are made by adding sodium hydroxide or potassium hydroxide, coconut oil, salt etc.	1. Synthetic detergents are made from kerosene and fats.
2. Soaps do not produce lather in hard water.	2. Synthtic detergents produce lather in hard water too.
3. Simple soaps may not clean the clothes effectively.	3. Synthetic detergents clean the clothes effectively.
4. Mild soap are not harmful for the skin.	4. Synthetic detergents are harmful for the skin.

(c) Bath soap and Soap for washing cloths.

Ans : Similarities : Both the soaps contain fatty acids and both are used for cleansing.

Bath soap	Soap for washing cloths
1. Bath soap is used for personal cleanliness.	1. Soap for washing clothes keeps the clothes clean.
2. This is mild soap.	2. It is a hard soap.
3. This is a potassium salt of fatty acids.	3. This is a sodium salt of fatty acids.

(d) Modern cement & Ancient cement.

Ans : Similarities : Both are used for construction work.

Modern cement	Ancient cement
1. Modern cement is made from silica (Sand), alumina (Aluminum oxide), lime, iron oxide and magnesia (Magnesium oxide)	1. Ancient cement is made by mixing volcanic ash in moistened lime.

4. Explain why.

(1) Soap cannot be used in hard water.

Ans : There are different types of salts in the hard water. Therefore soap does not give lather but forms a scum. Due to scum soap loses its cleansing property. Therefore, soap cannot be used in hard water.

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

Ans : The detergent is a long molecule with two ends. At one and it holds the oil molecule while at the other end it holds the water molecule. This makes a mixture of oil and water he result is homogenous mixture. Thus normally oil and water will not mix. But addition of detergent makes the homogenous mixture of oil and water.

(3) Synthetic detergents are superior to soap.

Ans : The synthetic detergents can be used in hard water. There are many additives such as germicides, alcohol, anti-foaming agents, moisturizers, fine sand, etc. mixed with different detergents. These supportive substances make synthetic detergents more useful than a soap and thus they are superior to soap.

(4) Often coloured spots are formed on clothes during washing

Ans : Sometimes impurities in the soap can form the spots on clothes. Some spots like those of turmeric become red upon the action of soap. Thus coloured spots are seen during washing.

(5) Tobacco masheri should not be used for cleaning teeth.

Ans : Tobacco is a harmful substance for the health. It can cause addiction and cancer. Masheri made up of tobacco can cause harmful effects on teeth and gums. Therefore, tobacco masheri should not used for cleaning teeth.

5. How to made of soap.

Material : 15g sodium hydroxide, 60 ml coconut oil, 15g salt, perfume, a glass rod, breaker, tripod, wire gauze, burner, water, mould etc.

Procedure : Take 60ml coconut oil in a beaker. Dissolve 15g sodium hydroxide in 50 ml water. Mix the sodium hydroxide solution in the oil slowly while stirring it with a glass rod. Heat the mixture, and boil it for 10-12 minutes, stirring it all the while heating. Dissolve 15 g salt in 200 ml water. Pour this solution into the above mixture and stir. The soap formed by the chemical reaction now floats on the water. After some time, it becomes thick. Now, separate the thick soap and add the perfume to it. Shape the bar of soap using the mould.

In the above process, fat and alkali combine to form salts of fatty acids. Chemically, soap is a sodium or potassium salt of fatty acids.

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