

## UNIT – 10 CHANGES AROUND US

CLASS : VIII

SUBJECT: SCIENCE

### I. Choose the best answer

- Burning of paper is a \_\_\_\_\_ change.  
a) physical      **b) chemical**      c) physical and chemical      d) neutral
- Burning of matchstick is an example for chemical reaction caused by \_\_\_\_\_.  
a) contact in physical states      b) electricity  
**c) light**      d) catalyst
- \_\_\_\_\_ undergoes rusting.  
a) Tin      b) Sodium      c) Copper      **d) Iron**
- The pigment responsible for browning of apples is \_\_\_\_\_.  
a) hydrated iron (II) oxide      **b) melanin**      c) starch      d) ozone
- Brine is a concentrated solution of \_\_\_\_\_.  
a) sodium sulphate      **b) sodium chloride**  
c) calcium chloride      d) sodium bromide
- Limestone contains \_\_\_\_\_ mainly.  
a) calcium chloride      **b) calcium carbonate**  
c) calcium nitrate      d) calcium sulphate
- Which of the following factor induces electrolysis?  
a) Heat      b) Light      **c) Electricity**      d) Catalysis
- In Haber's process of producing ammonia \_\_\_\_\_ is used as a catalyst.  
a) nitrogen      b) hydrogen      **c) iron**      d) nickel

9. Dissolved gases like sulphur dioxide and nitrogen oxides in rain water causes \_\_\_\_\_

- a) acid rain                      b) base rain                      c) heavy rain                      d) neutral rain

10. \_\_\_\_\_ is/are responsible for global warming.

- a) Carbon dioxide                      b) Methane  
c) Chlorofluorocarbons                      d) Carbon dioxide, Methane,  
Chlorofluorocarbons

## II. Fill in the blanks.

1. Photosynthesis is a chemical reaction that takes place in the presence of sunlight.
2. Iron objects undergo rusting when exposed to water and oxygen .
3. Ammonia is the basic material to manufacture urea.
4. Electrolysis of brine solution gives chlorine and hydrogen gases.
5. Catalyst is a chemical substance which alters the speed of a chemical reaction.
6. poly phenol oxidase or tyrosinase is the enzyme responsible for browning of vegetables and fruits.

## III. Say true or false. If false, correct the statement.

1. A chemical reaction is a **permanent** reaction. **False**
2. Decomposition of lead nitrate is an example for a chemical reaction caused by light **False**
3. Formation of slaked lime from quicklime is an **exothermic** reaction. **False**

4. CFC is a pollutant. True
5. Light energy may come out due to chemical reactions. True

**IV. Match the following.**

- a.**
- |                 |   |                            |   |
|-----------------|---|----------------------------|---|
| 1. Rusting      | - | Photosynthesis             | 4 |
| 2. Electrolysis | - | Haber's process            | 5 |
| 3. Thermolysis  | - | Iron                       | 1 |
| 4. Food         | - | Brine                      | 2 |
| 5. Catalysis    | - | Decomposition of limestone | 3 |
- b.**
- |                  |   |                   |   |
|------------------|---|-------------------|---|
| 1. Spoilage      | - | Decomposition     | 5 |
| 2. Ozone         | - | Biocatalyst       | 4 |
| 3. Tarnishing    | - | Oxygen            | 2 |
| 4. Yeast         | - | Chemical reaction | 3 |
| 5. Calcium oxide | - | Food              | 1 |

**V. Answer briefly.**

**1. Define a chemical reaction.**

A chemical change is a permanent and irreversible change which produces a new substance. Chemical changes are otherwise called as chemical reactions, because one or more substances (reactants) undergo a reaction to form one or more new substances (products).

Reactant(s)  $\longrightarrow$  Product(s).

**2. Mention the various conditions required for a chemical reaction to occur.**

- a. Contact in physical states
- b. Solution of reactants
- c. Electricity
- d. Heat
- e. Light
- f. Catalyst

**3. Define catalysis.**

Chemical substance which is used to speed up a chemical reaction is called as catalyst and the process is called catalysis.

**4. What happens when an iron nail is placed in copper sulphate solution?**

- When iron nail dipped in the solution of copper sulphate, copper is displaced by iron and forms ferrous sulphate.
- Thus the blue colour of copper sulphate change into green because of formation of ferrous sulphate.

## 5. What is pollution?

An unwanted change in the physical, chemical and biological properties of the environment. This is termed as pollution.

## 6. What is tarnishing? Give an example.

- ❖ Shiny metal surfaces and other articles lose their shining appearance due to chemical reactions on the surface. For example, silver articles become black when exposed to atmospheric air.
- ❖ Similarly, brass vessels which contain copper as one of the constituents develop a greenish layer when exposed to air for a long time.
- ❖ This is due to a chemical reaction between copper and moist air to form basic copper carbonate and copper hydroxide.

## 7. What happens to the brine during electrolysis?

- ❖ A concentrated solution of sodium chloride called brine is electrolyzed to produce chlorine and hydrogen gases along with sodium hydroxide.
- ❖ This is an important reaction to produce chlorine industrially.

## 8. On heating, calcium carbonate gives calcium oxide and oxygen. Is it an exothermic reaction or an endothermic reaction?

Ans: Endothermic reaction.

## 9. What is the role of a catalyst in a chemical reaction?

Chemical substances are used to speed up chemical reactions.

These substances are called catalysts. For example, metallic iron is used as a catalyst in the manufacture of ammonia using Haber's process.

## 10. Why photosynthesis is a chemical reaction?

- Photosynthesis ('photo' means light and 'synthesis' means production) is a process in which light energy from the sun is used by the plants to prepare starch from carbon dioxide and water.
- The sunlight induces the chemical reaction between carbon dioxide and water, which finally ends up in the production of starch. Thus, chemical reactions induced by light are called as photochemical reactions.

## VI. Answer in detail.

### 1. Explain the environmental effects of chemical reactions?

#### a. Pollution

- Our environment provides air to breathe, water to drink and the land to produce food. Due to industrial processes and increasing number of automobiles, our environment is badly affected now-a-days.

- So, there is an unwanted change in the physical, chemical and biological properties of the environment. This is termed as pollution. The substances which cause these changes are called pollutants.
- Generally there are three types of pollutions viz air, water and land pollution. Due to increasing human activities, lot of chemical substances are produced artificially which harm all the living and non living things.

### **b. Rusting**

The iron metal come into contact with water and oxygen, it undergoes a chemical reaction called rusting.

### **c. Tarnishing of metal articles**

- Shiny metal surfaces and other articles lose their shining appearance due to chemical reactions on the surface.
- For example, silver articles become black when exposed to atmospheric air.
- Similarly, brass vessels which contain copper as one of the constituents develop a greenish layer when exposed to air for a long time.
- This is due to a chemical reaction between copper and moist air to form basic copper carbonate and copper hydroxide.

## 2. Explain how food items are spoiled by chemical reactions?

### a. Spoilage of food and vegetables

- Food spoilage may be defined as any change that causes food unfit for human consumption.
- The chemical reactions catalysed by the enzymes result in the degradation of food quality in the form of development of bad tastes and odour, deterioration and loss of nutrients.

### Examples

- Rotten eggs develop a bad smell due to formation of hydrogen sulphide gas.
- Decaying of vegetables and fruits due to microbes.

### b. Rancidity of fishes and meat

Fishes and meat containing high levels of poly unsaturated fatty acids undergo oxidation. It causes bad odour when exposed to air or light. This process is called rancidity.

### c. Apples and fruits turn brown when cut

- Apples and some fruits turn brown due to chemical reaction with oxygen in air. This chemical reaction is called browning. The cells of apples,



fruits and other vegetables contain an enzyme called polyphenol oxidase or tyrosinase.

- When in contact with oxygen it catalyses a biochemical reaction in which the phenolic compounds present in plants become a brown pigment known as melanins.

**3. Explain any three conditions that is required for a chemical reaction to take place. Give example.**

**Solution of reactants:**

- ❖ When milk is mixed with coffee decoction the colour of the milk and the decoction changes due to chemical reaction.
- ❖ Similarly, when we mix two substances (reactants) in solution form, a chemical reaction takes place between them to form new substances (products).
- ❖ For example, take small amount of solid silver nitrate and sodium chloride in a test tube. Do you observe any change?
- ❖ No, because the reactants in solid state have no reaction. Now, you dissolve the same reactants in water in a separate test tubes and mix both the solutions. What do you observe? Silver nitrate solution

reacts with sodium chloride solution to form a white precipitate of silver chloride and sodium nitrate solution.

- ❖ From the above reaction, we infer that some chemical reactions proceed only in solution form not in solid form.

### Electricity:

- ❖ Electricity is essential for our living. We use electricity for cooking, lighting, grinding, watching television etc.
- ❖ Do you know electricity can be used to carry out chemical reactions also? Many chemical reactions which take place with the help of electricity are industrially very important.
- ❖ As you know, water is made of hydrogen and oxygen molecules. When electricity is passed through water which contains small amounts of sulphuric acid, hydrogen and oxygen gases are liberated.
- ❖ Similarly, a concentrated solution of sodium chloride called brine is electrolysed to produce chlorine and hydrogen gases along with sodium hydroxide. This is an important reaction to produce chlorine industrially.

- ❖ Thus, we can conclude that some chemical reactions proceed only by the passage of electricity. Hence, such reactions are called as electrochemical reactions

### Light:

- ❖ What will happen if there is no sunlight? All the living organisms will be affected and there will be no food for us to survive, is n't it? Sunlight is important not only for us but also for plants.
- ❖ As you know photosynthesis ('photo' means light and 'synthesis' means production) is a process in which light energy from the sun is used by the plants to prepare starch from carbon dioxide and water.
- ❖ The sunlight induces the chemical reaction between carbondioxide and water, which finally ends up in the production of starch. Thus, chemical reactions induced by light are called as photochemical reactions.

### VII. Higher order thinking questions.

#### 1. Explain the role of yeast in making cakes and buns in a bakery?

- a. Yeast is a key ingredient in the production of baked goods.

b. Yeast is a bio-organic catalyst carbon di oxide generated by the yeast as the result of the breakdown of fermentable sugars in the dough and makes cake rise .

## **2. Burning of fossil fuels is responsible for global warming. Justify the statement.**

- ❖ The combustion of fossil fuels also release a large amount of carbon di oxide into the atmosphere carbon dioxide is a green house gas which is responsible for global warming .
- ❖ Humans burn fossil fuels, releasing huge amount of fossil fuels , releasing huge amount of carbon pollution and trapping more and more heat in the atmosphere.

## **3. Discuss how acid rain occurs due to emission of smoke from vehicles and industries?**

1. Rain becomes acidic in nature due to the presence of certain pollutant's in the air released by the cars and industrial processes.

2. Acid rain is caused by emissions of sulphur di oxide and nitrogen oxide which react with water molecule in the atmosphere.

#### 4. Is rusting good for iron materials? Explain.

- ❖ No rusting is not good for iron materials . Rust is the form of iron oxide . It occurs when iron combines with the oxygen in the air causing it to corrode.
- ❖ Rust can affect iron and its alloys. It makes them weaker, by replacing the strong iron with flaky powder.

#### 5. Do all the fruits and vegetables undergo browning? Explain.

- ❖ No, Apples and some fruits turn brown due to chemical reaction with oxygen in air. This chemical reaction is called browning.
- ❖ The cells of apples, fruits and other vegetables contain an enzyme called polyphenol oxidase or tyrosinase.
- ❖ When in contact with oxygen it catalyses a biochemical reaction in which the phenolic compounds present in plants become a brown pigment known as melanins.

#### 6. Classify the following day to day activities based on chemical reactions by physical contact, solutions of reactants, heat, light, electricity and catalyst.

a ) Burning of crackers during festivals.

Sound

b) Fading of coloured clothes on drying under sunlight.

Heat

c) Cooking of eggs.

Heat

d) Charging of batteries.

Electricity

### VIII. Value Based Questions.

1. Kumar is going to build a house. To purchase the iron rods required for construction, he visited an iron and steel shop nearby. The seller showed him some iron rods which are fresh and good. He also showed him little older iron rods which are brownish in appearance. The price of fresh rods is more than the older ones. The seller also gave some offer to older ones. Kumar's friend Ramesh advised him not to buy the cheaper rods.

**a) Is Ramesh right in his suggestion?**

Ans: Yes, Ramesh is right in his suggestion because old iron rods were rusted.

**b) Could you explain the reason for his suggestion?**

Ans: The older rods are brownish and they are rusted. Rusting destroy the quality of iron rods and harmful for construction.

**c) What are the values shown by Ramesh?**

Ans: Responsible behavior , correct decision , caring and awareness.

2. Palanikumar is a Lawyer. He lives in a luxurious flat. Due to high rent, he wants to shift his residence to a place where he has a chemical industry nearby. There the rent is very cheap and the area is less populated also. His son Rajasekar, studying VIII, does not like this and likes to go to some other place.

**a) Is Rajasekar right in his attitude?**

Ans: yes, Rajasekar is more concerned over his family health than saving money.

**b) Why did he refuse to go there?**

Ans: Rajasekar know that air pollution near by chemical industry would be harmful and affect his family health.

**c) What are the values shown by Rajasekar?**

Ans: Environmentally sensitive, awareness, caring and correct decision.