

Chapter 5

Changes Around Us

I. Multiple choice Questions

Question 1.

Burning of paper is a change.

- (a) Physical
- (b) Chemical
- (c) Physical & chemical
- (d) Neutral

Answer:

- (b) Chemical

Question 2.

The burning of matchstick is an example for chemical reaction based on

- (a) Contact
- (b) Electricity
- (c) Light
- (d) Catalyst

Answer:

- (c) Light

Question 3.

..... metal undergoes rusting.

- (a) Tin
- (b) Sodium
- (c) Copper
- (d) Iron

Answer:

- (d) Iron

Question 4.

The pigment responsible for browning of apples is

- (a) Hydrated iron (II) oxide
- (b) Melanin
- (c) Starch
- (d) Ozone

Answer:

- (b) Melanin

Question 5.

Brine is a concentrated solution of

- (a) Sodium sulphate
- (b) Sodium chloride
- (c) Calcium chloride
- (d) Sodium bromide

Answer:

- (b) Sodium chloride

Question 6.

Limestone contains mainly.

- (a) Calcium chloride
- (b) Calcium carbonate
- (c) Calcium nitrate
- (d) Calcium sulphate

Answer:

- (b) Calcium carbonate

Question 7.

Which of the following factor induces electrolysis?

- (a) Heat
- (b) Light
- (c) Electricity
- (d) Catalysis

Answer:

- (c) Electricity

Question 8.

In Haber's process of producing ammonia is used as a catalyst.

- (a) Nitrogen
- (b) Hydrogen
- (c) Iron
- (d) Nickel

Answer:

- (c) Iron

Question 9.

Dissolved gases like sulphur dioxide, nitrogen oxides in rain water causes

- (a) Acid rain
- (b) Base rain
- (c) Heavy rain
- (d) Neutral rain

Answer:

- (a) Acid rain

Question 10.

..... is responsible for Global warming.

- (a) Carbon di oxide

- (b) Methane
- (c) Chlorofluoro carbons
- (d) All the above

Answer:

- (a) Carbon di oxide

II. Fill in the blanks

1. Reactants →
2. Photosynthesis is a chemical reaction that takes place in presence of Iron objects undergo rusting when exposed to and
3. Iron objects undergo rusting when exposed to and
4. is the basic material to manufacture urea.
5. Electrolysis of Brine solution gives gases.
6. is a chemical substance which alters the speed of a chemical reaction.
7. is the enzyme responsible for browning of vegetables, fruits.

Answer:

1. Products
2. Sunlight
3. Water, oxygen
4. Ammonia
5. Chlorine and hydrogen
6. Catalyst
7. Poly phenol oxidase or tyrosinase

III. Write True Or False for the following

Question 1.

A chemical reaction is a temporary reaction.

Answer:

False.

Correct statement:

A chemical reaction is permanent.

Question 2.

Change in colour may take place during a chemical reaction.

Answer:

True.

Question 3.

Formation of slaked lime from quicklime is a endothermic reaction.

Answer:

False.

Correct statement:

Formation of slaked lime from quicklime is an exothermic reaction.

Question 4.

CFC is a pollutant.

Answer:

True.

Question 5.

Browning of some vegetables and fruits is due to tannin formation.

Answer:

False.

Correct statement:

Browning of some vegetables and fruits is due to melanin formation.

IV. Match the following

Question 1.

A		B	
1.	Rusting	(a)	photosynthesis
2.	Electrolysis	(b)	Haber's process
3.	Thermolysis	(c)	Iron
4.	food	(d)	Brine
5.	Catalysis	(e)	Decomposition of limestone

Answer:

1. c
2. d
3. e
4. a
5. b

Question 2.

A		B	
1.	Rancidity	(a)	Decomposition
2.	Ozone	(b)	biocatalyst
3.	Tarnishing	(c)	oxygen
4.	Yeast	(d)	chemical reaction
5.	Calcium Oxide	(e)	fish

Answer:

1. e
2. c
3. d
4. b
5. a

V. Give Short Answers For The Following Questions

Question 1.

Define a chemical reaction. .

Answer:

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) → Product(s)

Question 2.

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

Answer:

The conditions required for a chemical reaction to take place:

1. Physical contact
2. Solution of reactants
3. Electricity
4. Heat
5. Light
6. Catalyst

Question 3.

Define catalysis.

Answer:

Chemical substance used to alters the speed of the reaction is called catalyst and the process is called catalysis.

Question 4.

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

Answer:

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

Question 5.

What is pollution?

Answer:

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

Question 6.

What is Tarnishing? Give an example.

Answer:

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 on exposure to atmospheric air.

Similarly, brass vessels which contain copper as one of constituents develop a greenish layer on exposure 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.

Question 7.

What happens to the brine during electrolysis?

Answer:

A concentrated solution of sodium chloride called Brine is electrolysed to produce chlorine and hydrogen gases along with sodium hydroxide. This is a very important reaction to produce chlorine industrially.

Question 8.

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

Answer:

Endothermic reaction.

Question 9.

What is the role of a catalyst in a chemical reaction?

Answer:

Substances used to alter the speed of a chemical reaction, are called catalysts. For example, metallic iron is used as a catalyst in the manufacture of ammonia by Haber's process.

Question 10.

Why photosynthesis is a chemical reaction?

Answer:

1. Photosynthesis is a process in which light energy from the sun is used by the plants to prepare starch from carbon dioxide and water.

2. The sunlight uses the chemical reaction between carbon dioxide and water, which finally ends up in the production of starch (photo means light and synthesis means production). These chemical reactions in used by light are called as photochemical reactions.

Shrot Questions

Question 1.

Explain the role of yeast in making cakes?

Answer:

1. Yeast is a key ingredient in the production of baked goods.
2. Yeast is a bio – organic catalyst carbon dioxide is generated by the yeast as a result of the breakdown of fermentable sugars in the dough and makes cakes to rise.

Question 2.

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

Answer:

The combustion of fossil fuels also releases a large amount of carbon dioxide into the atmosphere. Carbon dioxide is a greenhouse gas which is responsible for global warming. Humans burn fossil fuels, releasing huge amounts of carbon pollution and trapping more and more heat in the atmosphere.

Question 3.

Discuss acid rain occurs due to emission of smoke from vehicles and industries.

Answer:

1. Rain becomes acidic in nature due to the presence of certain pollutants in the air released by cars and industrial processes.
2. Acid rain is caused by emissions of sulphur dioxide and nitrogen oxide which react with the water molecules in the atmosphere.

Question 4.

Is rusting good for Iron materials? Explain.

Answer:

No. Rusting is not good for iron materials. Rust is a 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.

Question 5.

Do all the fruits and vegetables undergo browning? Explain.

Answer:

No, not all the fruits. Enzymic browning can be observed in fruits such as apricots, pears, bananas, grapes and avocados and vegetables such as aubergines, potatoes, lettuce. The enzyme polyphenol oxidase or tyrosinase that when in contact with oxygen catalyses a biochemical reaction of plants phenolic compounds to brown pigments known as melanin, which results in the fruit or vegetable turning brown.

Question 6.

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

1. Burning of crackers during festivals

2. Addition of water to quicklime to make it slaked lime
3. Silver ornaments become black on exposure to air for a longtime
4. Copper vessel kept in open air for long time

Answer:

1. Chemical reaction.
2. Exothermic reaction.
3. Tarnishing.
4. Rusting.

VI. Answer In Detail

Question 1.

Explain how food items are spoilt due to chemical reactions?

Answer:

1. Spoilage of food and vegetables:

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

Example 1 : Rotten eggs develop a bad smell due to formation of hydrogen sulphide gas.

Example 2 : Decaying of vegetables and fruits due to microbes.

2. Rancidity of fishes and meat:

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

3. 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 come in contact with oxygen catalyses a biochemical reaction of plants, phenolic compounds to brown pigments known as melanins.

Question 2.

Explain the three types of pollution.

Answer:

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.

Types of chemical substances and their effects:

S. No	Type of pollution	Chemical substances responsible for the pollution	Effects
1.	Air pollution	Carbon dioxide, Carbon monoxide, oxides of sulphur, oxides of nitrogen, Chlorofluorocarbons, methane etc.	Acid rain, Global warming, respiratory problems etc.
2.	Water pollution	Waste water containing chemical substances (e.g dyeing industries), detergents, oil spillage etc.	Decrease in quality of water, skin diseases etc.
3.	Land pollution	Fertilizers like urea, various pesticides, herbicides etc.	Spoilage of land, cancer, respiratory diseases etc.

Question 3.

Explain any three conditions that is required for a chemical reaction to take place by citing one example each.

Answer:

Conditions required for a chemical reaction to take place:

Chemical reactions can be done through:

1. Physical contact
2. Solution of reactants
3. Electricity
4. Heat
5. Light
6. Catalyst

1. Chemical Reactions Based On Solution Of Reactants:

When we mix two substances (Reactants) in solution form, the chemical reaction takes place to form new substances (Products).

Example:

- Take small amount of solid silver nitrate and sodium chloride in a test tube. The reactants in solid state have no reactions.
- Dissolve the same reactants in water in separate test tubes.
- Mix both the solutions. 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.

2. Chemical Reaction Based On Electricity:

- When electricity is passed through water containing 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 a very important reaction to produce chlorine industrially.
- From the above two reactions, we infer that some chemical reactions proceed only by the passage of electricity.
- Hence, such reactions are called as electrochemical reaction or electrolysis.

3. Chemical Reactions Based On Light:

Sunlight is important not only for us but also for plants as well. As you know photosynthesis is a process in which light energy from the sun is used by the plants to prepare starch from carbon dioxide and water.

Example:

The sunlight uses the chemical reaction between carbon dioxide and water, which finally ends up in the production of starch (photo means light and synthesis means production). These chemical reactions which are used by light are called as photochemical reactions.

VII. Value Based Questions

Question 1.

Kumar is going to build a house. To purchase the iron rods required for construction, he visited an Iron & 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 are costlier 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.

1. Is Ramesh right in his suggestion?
2. Could you explain the reason for his suggestion?
3. What are the values shown by Ramesh?

Answer::

1. Yes, Ramesh is right in his suggestion because old iron rods were rusted.
2. The older rods are brownish and they are rusted. Rusting destroys the quality of the iron rods and harmful for construction.
3. Responsible behaviour, correct decision, caring and awareness.

Question 2.

Palanikumar is a Lawyer. He lives in a costly 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. Rajasekar, his son studying VIII does not like this and likes to go to some other place.

1. Is Rajasekar right in his attitude?
2. Why did he refuse to go there?
3. What are the values shown by Rajasekar?

Answer:

1. Yes, Rajasekar is more concerned over his family health than saving money.
2. Rajasekar know that the air pollution from nearby chemical industry would be harmful and affect his family health.
3. Environmentally sensitive, awareness, caring and correct decision.