

ANSWERS TO TEXTBOOK QUESTIONS

Objective Questions **Science Mission cl 8 Chp14 ChemicalEffectsofElectricCurrent**

A. Multiple choice questions.

1. d 2. b 3. d 4. c 5. d
6. c

B. State whether 'true' or 'false'.

1. False 2. True 3. True 4. False 5. True
6. False 7. False 8. True 9. False 10. True

C. Give one word answers.

1. Salt 2. Cathode 3. Anode 4. Electroplating 5. Voltmeter
6. Cation 7. Anion 8. Galvanization 9. Tinning 10. Electrolysis
11. Sodium hydroxide 12. LED and magnetic compass 13. Anode
14. Copper sulphate in solution

D. Strike out the wrong word.

1. cathode 2. oxygen 3. thermoplasting 4. bad 5. voltmeter

Theoretical Questions

A. Short answers type questions.

- All metals like gold, silver, copper, aluminium, iron, salt water are good conductors of electricity.
- Pure water, cooking oil, wood, plastic, paper and stones are poor conductors of electricity.
- No. Pure water is a bad conductor of electric.
- We can test the presence of weak current in a circuit by using a led or magnetic needle.
- A liquid which can conduct electricity is called an electrolyte.
- Fresh vegetable are good conductor of electricity.
- A greenish-blue spot on cut potato is formed showing the 'change in colour' on passing electric current through a vegetable (potato). The change in colour is seen only around the positive terminal.
- Electroplating is the process of depositing a thin film (coating) of desired metal over the object made from a base (cheaper and corrosive) metal by passing electric current through an electrolyte in its electrolytic solution. Thermoplasting is the process in which the object or the metal to be coated is heated first and then a coating of another molten metal is applied on it.

B. Long answer type questions.

- Mercury
 - Tap water, rainwater, carbonic acid, vinegar (acetic acid), lemon juice (citric acid) and ammonium chloride are some of the weak electrolytes.
 - Distilled water (pure water), vegetable oils, glycerin and kerosene are non- conductors of electricity.
- Keep your hands dry. Better wear rubber gloves on hands. Stand on a rubber mat.
 - The chemical reactions brought about by passing an electric current through a solution is used in
 - electrolysis;
 - identifying the unmarked positive and negative terminal of a battery by change in colour;
 - electroplating;
 - purification of impure metal or ores;
 - preparing various compounds;
 - A water soluble salt is taken as an electrolyte. Pure water is used to dissolve the electrolyte to avoid any other impurity. This way electrolysis process takes place smoothly.
 - Chemical effect of electric current is seen when electric current is passed through a solution. Chemical effect of electric current results in formation of new substances which have different properties.

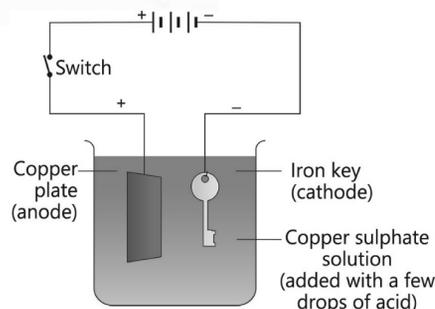
For example, when electric current is passed through water added with a little of common salt (an electrolyte) then chemical reaction takes place and water decomposes into hydrogen and oxygen. This is one chemical effect of electric current. Decomposition of water into hydrogen and oxygen is called electrolysis of water.

6. A dry cell or a battery has two terminals: +ve (positive) and –ve (negative). The metallic cap at the top of the dry cell is the +ve (positive) terminal of the cell. The base of the dry cell (zinc plate) is the –ve (negative) terminal of the cell. Current flows from the positive terminal to the negative terminal along the metallic wires with a bulb in between. The bulb does not glow when the circuit is ‘open’, that is there is some break in the circuit. The bulb glows when the current passes through the closed circuit.
7. LED is a device which glows even with a very weak current and its glow is visible even from a distance. Hence, it is convenient to use LED in place of a magnetic compass in the ‘tester’. Glow in the LED is not affected by any magnet nearby. However magnetic compass is more sensitive to weakest electric current.
8. While passing electric current through a cut potato the two electric terminals are pierced in the potato. A greenish blue spot is formed on the potato around the positive terminal. No coloured spot is formed around the negative terminal.
A greenish–blue spot on cut potato is formed showing the ‘change in colour’ on passing electric current through a vegetable (potato). The change in colour is seen only around the positive terminal.
9. The objective of electroplating is to
 - (i) Protect the surface of the base (inferior) metal from corrosion (rusting) and give it a coating of shiny metal. For example, chromium and nickel plating of bicycle handlebar, wheel rims and spokes, gong on the bells, bathroom fittings, objects on cars or motor bikes and various tools made from iron or any other corrosive metal. Decoration pieces and cutlery made from inferior metal (iron or copper) is electroplated and is given a coating of nickel, silver or gold, as the case may be.
 - (ii) Electroplating using copper or some other cheaper metal with silver and gold to make artificial jewellery and zari for embroidery to make it look attractive and expensive.
 - (iii) Tin is electroplated on thin sheets of iron which are made into containers (cans and canisters) for storing all kinds of food products like milk powder, nutritional products, vegetable oils (including ghee) and kerosene. At one time, before aluminium alloy or stainless steel utensils came into use, kitchen utensils made from brass or copper were coated on the inner side, with tin by ‘hot process’ called ‘tinning’ or ‘thermo plating’. With the coating of tin, food stored in these utensils does not come in contact with corrosive metals like iron, copper etc. and is protected from getting spoilt. Tin metal is soft, shiny, non-corrosive and non-poisonous. Cans and utensils cannot be made out of tin since, it is too soft and its melting point is low hence, it is used as a coating only.

10. Process of Electroplating

Preparations for electroplating:

- (i) The object to be electroplated is cleaned with a dilute solution of alkali and is rinsed with dilute acid to remove dust, grease or any other deposit on its surface.
- (ii) Optimum temperature is required for conduction of electricity through electrolyte and for chemical reaction to take place; hence, necessary temperature is maintained around the electroplating equipment.
- (iii) Only direct current (DC) of suitable strength is used to maintain unidirectional movement of ions. (In our homes and industry we receive alternate current (AC) from power houses and hence, it cannot be used for electroplating directly without converting it into DC).



11. Production of a new compound is production of caustic soda that is sodium hydroxide (NaOH) from common salt (NaCl). Production of caustic soda (a strong alkali) and chlorine from strong salt solution is termed as 'Chloralkali process'. On passing a high electric current through a concentrated solution of sodium chloride, caustic soda is produced and chlorine is obtained as a bi-product.
12. a. Any substance which when dissolved in water makes the water a conductor of electricity is called an electrolyte
- b. Decomposition of a chemical compound in a solution by passing electric current through a conducting liquid is the chemical effect of electric current, and it is called electrolysis.
- c. Electroplating is the process of depositing a thin film (coating) of desired metal over the object made from a base (cheaper and corrosive) metal by passing electric current through an electrolyte in its electrolytic solution.
- d. A cathode is an electrode through which electrons or electricity moves out. It is also the positive terminal.
- e. An anode is an electrode which is negative terminal.
- f. Cations are negatively charged ions in the solution.
- g. Anions are positively charged ions in the solution.
- h. Iron sheets being used for sheds, body of the coolers and water pipe fittings are coated with zinc for protection against rusting by dipping the iron objects in molten zinc. This is called galvanizing. I
- i. At one time, before aluminium alloy or stainless steel utensils came into use, kitchen utensils made from brass or copper were coated on the inner side, with tin by 'hot process' called 'tinning' or 'thermo plating'.
13. a. An atom is the smallest constituent unit of ordinary matter that constitutes a chemical element. For example common salt (NaCl) is a compound of atoms of sodium and chlorine. These atoms remain united and bear no electrical charge on them. When salt is dissolved in water it dissipates into ions. Ion is electrically charged atom or a group of atoms with positive or negative charge on them. Ions which carry positive charge are called cations and the ions which carry negative charge are called anions.
- b. Metals are good conductors of electricity and they conduct electric charge on it by the movement of free electrons on its atoms. Electrolytic solutions have ions from the salt which has been dissolved in water. Ions bear electrical charge on them which move towards oppositely charged electrodes and conduct electricity through the solution.
- c. Mercury is a metal and hence a good conductor of electricity whereas glycerin is a liquid without any electrolyte and hence a non-conductor of electricity.
- d. A bulb glows when substantial amount of charge or electricity flows. LED is a device which glows even with a very weak current and its glow is visible even from a distance.
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