

Q. What is electricity?

Answer: Electricity is a phenomenon known for its effect like chemical effect, Heating effect and magnetic effect.

Q. What is the cause of electricity?

Answer: The flow of charge is the main cause of electricity.

Q. What is charge?

Answer: The fundamental properties of matter caused by gain or loss of electrons. SI unit of charge is Coulomb or C

Q. What is the charge on 1 electron?

Answer: 1.6×10^{-19} C

Q. How many electrons present in 1 coulomb charge?

Answer: $Q = n e \Rightarrow n = (1C)/(1.6 \times 10^{-19} C) = 6 \times 10^{18}$ electrons

Q. What are the two types of electricity on the basis of charge?

Answer: the two types of electricity on the basis of charge are:

(a) Static electricity: The electricity cause by the charge at rest.

(b) Current electricity: The electricity cause by the charge when in motion

Q. What is the cause of the flow of charge?

Answer: Electric potential or potential difference is the main cause of electric charge.

Q. What do you mean by chemical effect of current?

Answer: The phenomenon of causing chemical change by passing electric current through a conduction solution is called chemical effect of current. For example: Electrolysis and Electroplating

Q. What do you mean by heating effect of current?

Answer: Whenever current flows through a conductor it causes heating of material. This effect of current is known as heating effect of current.

Q. What do you mean by magnetic effect of current?

Answer: Whenever current flows through a conductor it behaves like a magnet. This effect of current is known as magnetic effect of current.

Q. What is LED?

Answer: LED stands for Light Emitting Diode. LED glows even when a weak electric current flows through it.

Q. What precaution you should take to add LED in a circuit?

Answer: The longer lead is always connected to the positive terminal of the battery and the shorter lead is connected to the negative terminal of the battery



Q. Why the bulb glows when the electric current passes through it?

Answer: Due to the heating effect of current, the filament of the bulb gets heated to a high temperature and it starts glowing.

Q. Does distilled water conduct electricity?

Or, Does pure water conduct electricity? If not, what can we do to make it conducting?

Answer: No. distilled [pure] water does not conduct electricity When salt is dissolved in distilled water, we obtain salt solution. This is a conductor of electricity.

Q. Is tap water good conductor or bad conductor?

Answer: Tap water is good conductor because of the number of gases and mineral mixed into it.

Formative Check point-01

State true and false

1. Non metals are good conductor of electricity?

False, except graphite. Generally metals are good conductor of electricity.

2. Whenever current passes through it causes heating of metal:

True

3. The full form of LED is Light Electrical device:

False

4. Pure water is bad conductor of electricity:

True

5. Tap water conducts electricity through it:

True

Fill in the blanks:

1. The work done to carry unit charge from infinity to a point in a conductor is called ----- [Electrical potential]

2. SI unit of Electrical potential is ----- [Volt]

3. The closed conducting path of electric current is called ----- [Electric circuit]

4. ----- is the work done to carry charge from one end of conductor to other end. [potential difference]

5. Potential difference is created by using ----- or ----- [Cell or battery]

6. The rate of the flow of electric charge is called -----. [Electric current]

7. The direction of electric current is always from ---- to ---- terminal of the battery. [Positive, negative]

8. When an electric current flows through a conducting solution, there is change of colour of the solutions. This effect of current is known as -- Chemical effect of current]

9. Oxygen bubbles formed on the electrode connected to the ----- terminal of the battery called anode during electrolysis. [Positive]

10. Hydrogen bubbles formed on the other electrode connected to the ----- terminal called cathode during electrolysis. [Negative]

11. An electrolyte when dissolve in water produce ---. [Ions]

12. Positively charged ion is called ----- [Cation]

13. Negatively charged ion is called ----- [Anion]

14. Sugar, urea, benzenes Ethyl alcohol are some examples of ----- [Non electrolyte.]

15. During electrolysis Cation gets reduced at -----.
[Cathode] and anions gets oxidized at ---- [anode]

Q. What is electrolysis?

Answer: The process of causing a chemical change in a solution by passing electricity is called electrolysis. This process is discovered by Johann Wilhelm. During electrolysis Cation gets reduced at Cathode and anion gets oxidized at anode.

Q. What is electrolyte?

Answer: The solution which contain electrode and conducts the current through itself is called electrolyte.

Or, A substance which conduct electricity when dissolve in water or when melted is called electrolyte.

Or. A substance which gives ion when melted or dissolves in water is called electrolyte.

Q. What phenomenon may occur during electrolysis?

Answer: At least one of the phenomenons may occur during electrolysis:

- (a) Deposition of gas bubbles on elected
- (b) Change in the colour of electrolyte solution
- (c) Deposition of metal on cathode

Q. Write some application of electrolysis?

Answer: The principal of electrolysis is used

- (i) Purifying impure metal into pure one [called Refining]
- (ii) Extraction of metal from their ores [called metallurgy]
- (ii) Manufacture of industrial chemicals
- (iv) Electroplating

Q. In case of a fire, before the firemen use the water hoses, they shut off the main electrical supply for the area. Explain why they do this.

Answer: This is because potable water is good conductor of electricity.

Q. A child staying in a coastal region tests the drinking water and also the seawater with his tester. He finds that the compass needle deflects more in the case of seawater. Can you explain the reason?

Answer: This is because seawater contains more salt and impurities than drinking water and a strong electrolyte.

Q. Define electroplating?

Answer: The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating. During electroplating, the object to be electroplated is made cathode and A thin plate of metal to be electroplated is made anode. A solution of any suitable salt of metal to be electroplated is used as electrolytes.

Q. Why is electroplating done?

Answer: electroplating is done for following purposes or reasons:

- (i) For decorating purposes: like silver or gold plating on flower vase
- (ii) For preventing corrosion

Q. Explain electroplating of Copper over iron Spoon.

Ans: (i) Iron is made cathode (- ve electrode) and copper is made to anode (+ve electrode)

- (ii) An acidified solution of CuSO_4 is used as an electrolytic solution

(ii) When current is passes, Cu^{2+} ion moves toward cathode an iron spoon and get reduced to copper metal and form layer over spoon.

- (iv) The sulphate solution (SO_4^{2-}) move towards anode but do not get oxidized. Instead, the copper metal of anode gets oxidized into Cu^{+2} and goes into the solution. As a result the concentration of Cu^{+2} ions in solution is maintained.

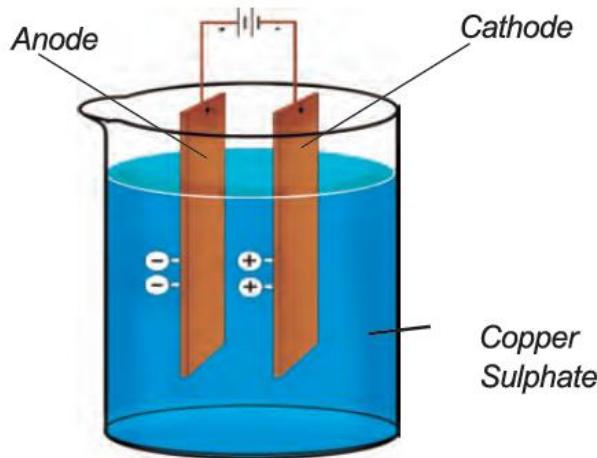
At Cathode:

Cu^{+2} (from solution) + 2e^- (from cathode) \rightarrow

Cu(s) (gets electroplated on spoon)

At Anode:

Cu(s) (copper from anode) $\rightarrow \text{Cu}^{+2}$ (goes into solution) + 2e^- (get transferred to cathode via external circuit)



Q. Why does zinc get attracted towards the negative terminal of the battery which is towards the copper plate?

Answer: In battery, the movement of electron takes place from cathode to anode. This shows that cathode is electron rich while anode is electron deficient. Since Zinc behave as anode therefore positively charged and get attracted towards negative terminal of battery.

Q. How can you prove conducting properties of substances when the current is very small and bulb does not glow?

Answer: By using magnetic compass.

Q. Why is chrome plating popular in the industries?

Answer: This is because of its low cost, easy processing and the wide ranges of applications.

Q. What are the factors on which the amount of metal deposited on cathode during electroplating depend on?

Answer: The factors on which the amount of metal deposited on cathode during electroplating depends on are:

- (i) The time for which the current passes through electrolyte
- (ii) The magnitude of current passes through electrolyte

Q. What is electrodeposition?

Answer: The electroplating is also used to increase the thickness of the part of machines, to make them the just right size this phenomenon is called electrodeposition

Q. What galvanization?

Answer: The process of dipping metal into zinc solution to form layer of zinc over another metal is called galvanization.

Zinc coated iron is called Galvanized Iron (GI). This iron is used in water taps (GI pipes), since they have high resistance to corrosion.