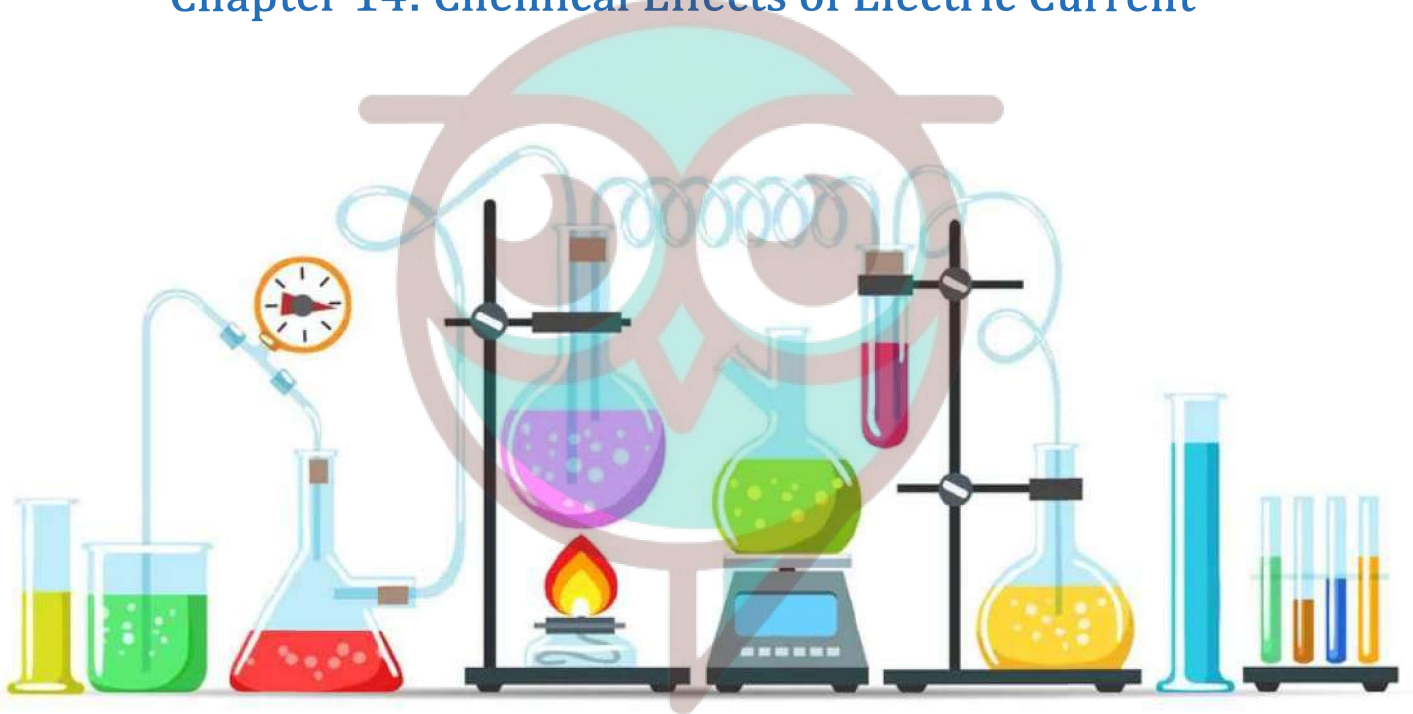


SCIENCE

Chapter 14: Chemical Effects of Electric Current



Swotters

Important Questions

Multiple Choice questions-

Question 1. Which of the following is a bad conductor of electricity?

- (a) Distilled water
- (b) Silver nitrate
- (c) Sulphuric acid
- (d) Copper sulphate

Question 2. Which of the following does not conduct electricity?

- (a) Sugar solution
- (b) Vinegar solution
- (c) Lemon juice solution
- (d) Caustic soda solution

Question 3. An electric current can produce

- (a) heating effect
- (b) chemical effect
- (c) magnetic effect
- (d) all of these

Question 4. Pure or distilled water is a

- (a) poor conductor
- (b) good conductor
- (c) both (a) and (b)
- (d) none of these

Question 5. Which of the following is a good conductor?

- (a) Brick
- (b) Steel
- (c) Plastic
- (d) Cotton

Question 6. Polythene is



- (a) a conductor
- (b) an insulator
- (c) both (a) and (b)
- (d) none of these

Question 7. Electroplating is based on

- (a) heating effect of electricity
- (b) chemical effect of electricity
- (c) physical effect of electricity
- (d) magnetic effect of electricity

Question 8. Copper is

- (a) a good conductor
- (b) an insulator
- (c) both (a) and (b)
- (d) none of these

Question 9. Waste from an electroplating factory must be disposed off

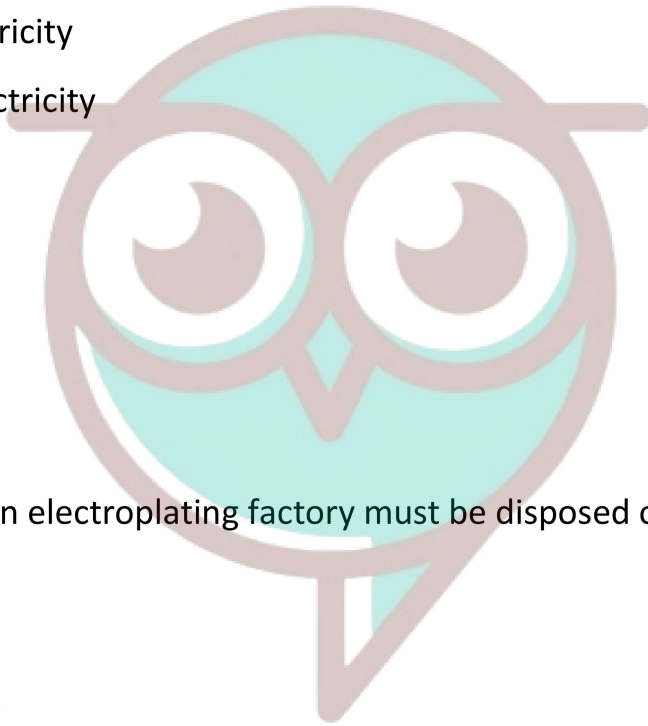
- (a) in the nearby river
- (b) in the nearby pond
- (c) in the nearby cornfield
- (d) according to the disposal guidelines of Waste Management Bodies

Question 10. An electrolyte is

- (a) a metal
- (b) a liquid that conducts current
- (c) a non-metal
- (d) none of these

Question 11. Flow of electron is called

- (a) electrolyte
- (b) electroplating
- (c) electrodes
- (d) electric current



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Question 12. Which is not a non-electrolyte?

- (a) Ethyl alcohol
- (b) Sodium chloride
- (c) Urea
- (d) Sodium solution

Question 13. An electric lamp glows due to

- (a) heating effect
- (b) magnetic effect
- (c) chemical effect
- (d) physical effect

Question 14. Electroplating prevents

- (a) corrosion
- (b) passing of current
- (c) dissociation
- (d) shining

Question 15. Which of the following is not used for electroplating metal articles?

- (a) Nickel
- (b) Silver
- (c) Chromium
- (d) Sodium

Very Short Questions :

1. What is electricity?
2. What is the cause of electricity?
3. What is charge?
4. What is the charge on 1 electron?
5. What are the two types of electricity on the basis of charge?
6. What is the cause of the flow of charge?
7. What do you mean by chemical effect of current?
8. What do you mean by heating effect of current?
9. What do you mean by magnetic effect of current?



10. What is LED?

Short Questions :

1. Differentiate between good conductors and bad conductors of electricity.
 2. Describe an electrical tester.
 3. How can we check whether a tester is working or not?
 4. How can you test whether lemon juice is good conductor or poor conductor of electricity?
 5. In some situation even liquid is allowing the electric current to pass but, bulb does not glow. Why so?
 6. Why the filament of bulb does not get heated sometimes in a circuit?
 7. Is it possible for an electric tester to detect weak current also, if no how can we detect weak current flowing in a circuit?
 8. Why materials classified as poor conductors, also allow electricity to pass under certain conditions?
 9. Distilled water is good conductor or bad, how can we make distilled water a good conductor?
10. Explain the functioning of a LED.

Long Questions :

1. On what factors thickness of the electroplated items depend?
2. With the help of a suitable diagram, explain electrolytic refining of copper.
3. Does water conduct electricity? Show with the help of an activity.

OR

Show the conductivity of water with the help of an activity.

4. What is electroplating? On which effect of the electric current is it based? Why is it done?
5. What are the advantages and disadvantages of electroplating?

ANSWER

MCQ:

1. Answer: (a) Distilled water
2. Answer: (a) Sugar solution
3. Answer: (d) all of these
4. Answer: (a) poor conductor
5. Answer: (b) Steel
6. Answer: (b) an insulator

7. Answer: (b) chemical effect of electricity
8. Answer: (a) a good conductor
9. Answer: (d) according to the disposal guidelines of Waste Management Bodies
10. Answer: (b) a liquid that conducts current
11. Answer: (d) electric current
12. Answer: (b) Sodium chloride
13. Answer: (a) heating effect
14. Answer: (a) corrosion
15. Answer: (d) Sodium

Very Short Answer:

1. Answer: Electricity is a phenomenon known for its effect like chemical effect, Heating effect and magnetic effect.
2. Answer: The flow of charge is the main cause of electricity.
3. Answer: The fundamental properties of matter caused by gain or loss of electrons. SI unit of charge is Coulomb or C
4. Answer: $1.6 \times 10^{-19} \text{C}$
5. Answer: The two types of electricity on the basis of charge are:
 - (a) Static electricity: The electricity caused by the charge at rest.
 - (b) Current electricity: The electricity caused by the charge when in motion
6. Answer: Electric potential or potential difference is the main cause of electric charge.
7. 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
8. Answer: Whenever current flows through a conductor it causes heating of material. This effect of current is known as heating effect of current.
9. Answer: Whenever current flows through a conductor it behaves like a magnet. This effect of current is known as magnetic effect of current.
10. Answer: LED stands for Light Emitting Diode. LED glows even when a weak electric current flows through it.

Short Answer :

1. Answer:

Good conductors of electricity	Bad conductors of electricity
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They allow electricity to pass through it	They do not allow electricity to pass through it
Metals are generally good conductors	Non- Metals are generally bad conductors
Eg: copper, aluminium	Eg: rubber, wood

2. Answer: An electrical tester is a simple piece of electronic test equipment used to determine the presence or absence of an electric voltage in a piece of equipment under test. It is also used to test whether a liquid allows electric current to pass through it or not.
3. Answer: Join the free ends of the tester together, for a moment, and check whether the bulb glows or not, if the bulb glows it means tester is working and if not it means tester is not working. In case it does not glow check that all connections are tight, or not.
4. Answer: Pour one table spoon of lemon juice in a plastic cap of discarded bottle, dip the end of tester into lemon juice, make sure that the tester should not more than 1 cm apart at also should not touch each other, we will observe the current flows in the circuit and bulb glows, this proves that lemon juice is good conductor.
5. Answer: This happens when current through the circuit is too weak to make the bulb glow.
6. Answer: This is because current through the circuit is too weak so the filament of the bulb does not get heated sufficiently and it does not glow.
7. Answer: If weak current flows through the circuit then bulb in it will not glow. In order to detect weak current we use LED or may use another effect of electric current that is it produces magnetic effect also so we can use this property of electric current to detect weak current.
8. Answer: Under certain condition most of the materials can conduct electricity thus it is right to say poor conductors instead of bad conductors or insulators.
9. Answer: Distilled water is a poor conductor but if we add some salt in it the resulting salt solution is good conductor.
10. Answer: LED stands for Light emitting diode. It is a semiconductor light source, use to detect weak current in the circuit. There are two wires attached to a LED, one lead is slightly longer than the another one, the longer lead is always connected to the positive terminal of battery and shorter lead is connected to negative terminal of battery

Long Answer:

1. Answer:

Thickness of electroplated items depend upon:

- The strength of the current passing through the circuit.
- The concentration of the metal ion in the solution.

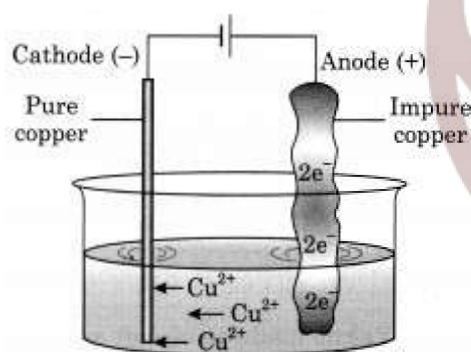
- The duration of the time the article has been in the solution.

2. Answer:

To purify copper, a thin plate of pure copper and a thick rod of impure copper are used as electrodes in the acidified solution of CuSO_4 . Pure copper is used as cathode and impure copper is used as anode. When electric current is passed through the copper sulphate solution, copper sulphate dissociates into copper and sulphate. The free copper gets drawn to the electrode connected to the negative terminal of the battery and gets deposited on it. From impure copper electrode, an equal amount of copper gets dissolved in the solution. Thus, the loss of copper from solution is restored and the process continues. The impurities are left behind at anode.

3. Answer:

Normal or ordinary water is a good conductor of electricity while distilled water is a bad conductor or insulator. Ordinary water may contain small amount of mineral salts dissolved in it naturally; on the other hand, distilled water is free of salts.



► Fig. 14.9 Electrolytic refining of copper

The following activity shows this fact:

About 50 mL of distilled water is taken in a clean and dry beaker. When the tester is dipped into the distilled water, the bulb does not glow which shows that distilled water is a bad conductor of electricity. But when a small amount of common salt is dissolved in distilled water and again tested the bulb glows which shows that distilled water when mixed with salts conduct electricity.

4. Answer:

The process of depositing or coating a layer of any desired metal on the surface of other material by means of electricity is called electroplating. It is one of the most common applications of chemical effects of electric current.

Electroplating is a very useful process. It is widely used in industry for coating metal objects with a thin layer of a different metal. The layer of metal deposited has some desired property, which the metal of the object lacks. For example, chromium plating is done on many objects to make them shiny and attractive.

5. Answer:

Electroplating is a very useful process. It is widely used in industry for coating metal objects with a thin layer of different metal. The advantages and disadvantages of electroplating are:

Advantages:

- It protects the metals from being corroded.
- It prevents the rusting of metals.
- It makes cheap and dull metals shiny and attractive.
- It can make more reactive metals like iron less reactive.
- Chromium coating on metals give lustre to objects.

Disadvantages:

- Pollutants from electroplating industries are very harmful. Some chemicals are very lethal for both human and animals.
- It is an expensive process.

