INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VIII	**DEPARTMENT OF SCIENCE-2024-25**	**DATE:19-12-2024**
WORKSHEET NO. 12 WITH ANSWERS	**TOPIC: CHEMICAL EFFECTS OF ELECTRIC CURRENT**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE-TYPE QUESTIONS

1. We have distilled water in two plastic bottles labelled A and B. If we add Hydrochloric acid to bottle A and Caustic soda (Sodium hydroxide) to bottle B, which of the following will hold true?

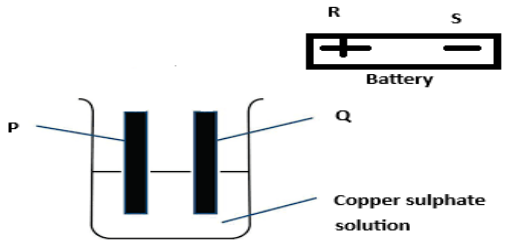
a) The solutions in both the bottles will conduct electricity.

b) Only the solution in bottle A will conduct electricity.

c) Only the solution in bottle B will conduct electricity.

d) The solutions in both bottles will not conduct electricity.

2. The diagram shows a beaker containing a solution of copper sulphate and two carbon electrodes P and Q. A battery is placed next to it, where R represents the positive and S represents the negative terminal. To coat P with copper then:



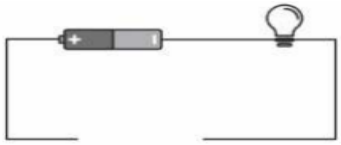
a) P must be connected to S and Q to R.

b) P must be connected to Q and S to R.

c) P must be connected to R and Q to S.

d) P and Q must be connected to R.

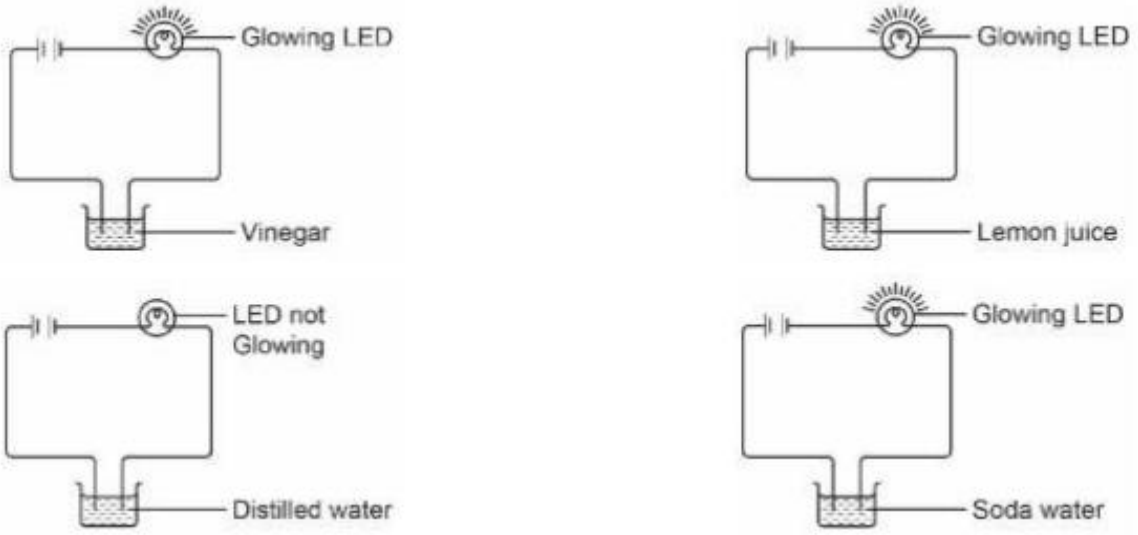
3. Ben experimented by placing four different objects in a gap within an electric circuit, one at a time. The table below shows his observations. Based on this, which of the following materials is the best conductor of electricity?



Object in the gap	The bulb
Plastic	Does not glow
Copper wire	Glows brightly
Wooden block	Does not glow
Graphite stone	Glows dimly

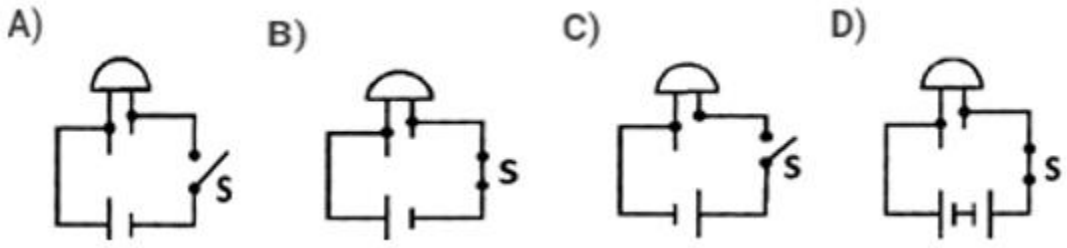
a) Wood
b) Plastic
c) Copper
d) Graphite

4. Rani made separate electric circuits with four different solutions. The pictures show what she found.



What conclusion can you draw from her observations?
a) LED glows only in solutions
b) All four solutions are insulators of electricity
c) All four solutions are good conductors of electricity
d) Acids are good conductors of electricity

5. Observe the given figure. Which of the following is the correct way of connecting an LED to light it up?



a) A
b) B
c) C
d) D

6. To obtain a coating of silver metal on a flower vase made of copper, the electrolyte has to be :

a) Silver nitrate solution

b) Copper nitrate solution

c) Sodium nitrate solution

d) Potassium nitrate solution

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below

i) Both A and R are true and R is the correct explanation of the assertion.

ii) Both A and R are true but R is not the correct explanation of the assertion.

iii) A is true but R is false.

iv) A is false but R is true

7. **Assertion (A):** We prefer LED over bulb in testing the electrical conductivity of liquids.
Reason (R): An LED glows even when a weak current flows through a circuit.
(i) Both A and R are true and R is the correct explanation of the assertion.

8. **Assertion (A):** Chromium does not corrode and resists scratches.
Reason (R): Chromium has a dull appearance.
iii) A is true but R is false.

9. **Assertion (A):** Water can be decomposed into hydrogen and oxygen by heating to a very high temperature.
Reason(R): The chemical effects of electric current are used to decompose various chemical compounds into their elements.
(iv) A is false but R is true.

10. **Assertion (A):** The disposal of used conducting solution in electroplating factories is a major concern.
Reason (R): Conducting solutions are used to deposit a layer of metal on objects during electroplating.

ii) Both A and R are true but R is not the correct explanation of the assertion.

II. VERY SHORT QUESTIONS (2M):

1. What do you mean by electrolysis of water?

[Hint: Electrolysis of water is the process by which water is split into hydrogen and oxygen by the application of electrical energy. Oxygen bubbles formed on the anode and hydrogen bubbles formed on the cathode]

2. What happens when an electric current is passed through the copper sulphate solution? **[Hint: When an electric current is passed through the copper sulphate solution, copper sulphate**

splits into copper and sulphate ions. The free copper gets drawn to the electrode connected to the negative terminal of the battery and gets deposited on it.]

3. If there is a gap between two wires in a circuit, the current does not flow. Does this mean air is always a poor conductor of electricity? Can air ever conduct electricity? **[Hint-Air is generally a poor conductor of electricity, especially when it is dry. However, under certain conditions, such as during lightning or when the air is moist, it can conduct electricity.]**

4. Why is chromium used for electroplating? Why the objects that have chromium plating are not made of chromium itself?

[Hint-Chromium has a shiny look. It does not get corroded and it resists scratches. Chromium is however expensive and it may not be economical to make the whole object out of it. So, the object is made from a cheaper metal and only a coating of chromium is done over it.]

5. What observation is made when a cut potato is used in an electric circuit for some time, and why does this happen? **[Hint: When a cut potato is part of an electric circuit for a considerable time, a greenish-blue spot forms around the positive electrode due to the chemical effects of electric current.]**

6. What precautions should be taken with the cell while using a tester, and why is it important? **[Hint- While using a tester, the free ends of the tester should not be joined for more than a few seconds. Doing so can cause the cells of the battery to drain very quickly.]**

7. What factors determine the thickness of electroplated items?

[Thickness of electroplated items depends upon: The strength of the current passing through the circuit, the concentration of the metal ion in the solution, and the duration of the time the article has been in the solution.]

8. What effect of electric current causes a bulb to glow in a circuit? [**Hint- The heating effect of electric current is responsible for the bulb's glow in an electric circuit. Due to the heating effect, the filament of the bulb gets heated to a high temperature and it starts glowing.]**

III. SHORT ANSWER TYPE QUESTIONS (3M):

1. Define i) electrodes ii) anode iii) cathode

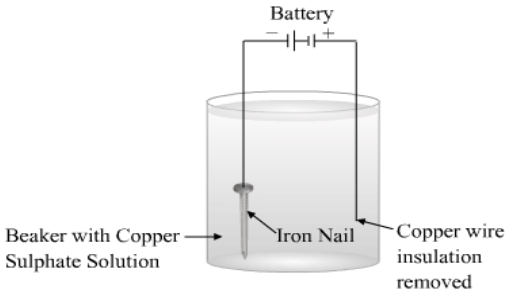
[Hint: i) A solid conductor through which electricity enters or leaves a substance.]

The electrodes are two in number and are made of metal or carbon.

(ii) The electrode through which current enters the electrolyte is called the anode

(iii) The electrode through which the current leaves the electrolyte is called the cathode]

2. For the electroplating of copper over an iron nail.



i) What is used as a positive terminal? **[Hint-copper strip]**

ii) Name the solution used. **[Hint- Copper sulphate]**

iii) What is used as a negative terminal? **[Hint- Iron nail]**

3. Give reasons for the following.

a) Operating electrical appliances with wet hands is very dangerous.

[Hint- Operating electrical appliances with wet hands is very dangerous as it may lead to electric shocks and even death. This is because water containing impurities is a good conductor of electricity. This makes wet skin several times more electrically conductive than dry skin.]

b) Sodium chloride solution is a good conductor of electricity.

[Hint-Sodium chloride is a salt, which is a poor conductor of electricity in its solid phase. However, when the salt is dissolved in water, it forms sodium and chloride ions. Ions are charged particles that help electric current flow in a salt solution, making sodium chloride solution a good conductor of electricity.]

c) Pure water is a poor conductor of electricity.

[Hint-Pure water is a poor conductor of electricity because it has very few ions in it to conduct electricity.]

IV. LONG ANSWER TYPE QUESTIONS (5 M):

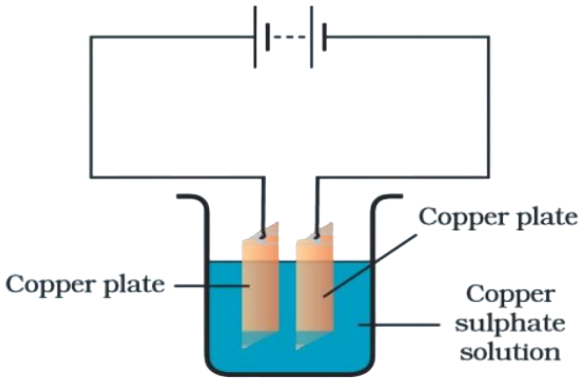
1. What are the advantages and disadvantages of electroplating?
   [Electroplating is a very useful process. It is widely used in industry for coating metal objects with a thin layer of a different metal. The advantages and disadvantages of electroplating are:
   Advantages:

- **It protects the metals from being corroded.**
- **It prevents the rusting of metals.**
- **It makes cheap and dull metals shiny and attractive.**
- **Chromium coating on metals gives lustre to objects.**

Disadvantages

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

2. a) In the circuit given in the figure, Boojho observed that copper is deposited on the electrode connected to the negative terminal of the battery. Paheli tried to repeat the same experiment. But she could find only one copper plate. Therefore, she took a carbon rod as the negative electrode. Will copper still be deposited on the carbon rod? Explain your answer.

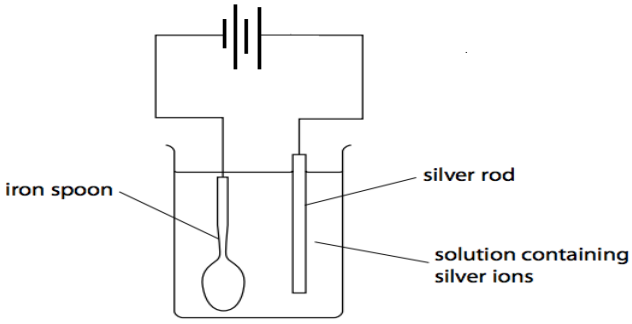


[Hint-Yes, copper from the copper sulphate solution will be deposited on the carbon rod. When an electric current is passed through the copper sulphate solution, copper sulphate dissociates into copper and sulphate ions. The free copper gets drawn to the electrode connected to the negative terminal of the battery, i.e. carbon rod and gets deposited on it. Thus, Paheli will obtain a coating of copper on the carbon rod.]

b) Mention one important difference in the conduction of electricity by solids and liquids.

[Hint: No chemical change occurs during the conduction of electricity in solids, but in liquids, chemical reactions occur, often leading to the production of gases, deposits, or other effects.]

c) Suppose you want to deposit silver on an iron spoon using silver nitrate as an electrolyte. Which terminal of the battery you should connect to the spoon? What material should the other electrode be made of?



Silver ion is positively charged, so the spoon must be connected to a negative terminal to deposit silver on it. The other electrode should be made of silver.]

V.SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

1. Mini and her mother visited a jewellery shop to purchase ornaments. Mini was drawn to a big, heavy necklace, but her mother explained that it wasn't made of real gold and advised against buying it. On inspecting the information tag, Mini noticed it said "1 gram of gold." She was puzzled and asked the salesman for clarification.

The salesman explained that the necklace was gold-plated, meaning it had a thin layer of gold deposited onto its surface. He further elaborated on the process of electroplating, where a layer of one metal is deposited on another using electricity. This technique is widely used in manufacturing gold-plated jewellery and coating iron articles with zinc or chromium to prevent rusting and corrosion.

The salesman also mentioned that while electroplating has many useful applications, it poses environmental concerns. Factories involved in electroplating produce used conducting solutions, which are classified as polluting waste. Proper disposal of these solutions is critical and must follow strict environmental guidelines to protect the ecosystem.

i.) What is gold plating, and how is it related to electroplating? **[Hint-Gold plating is the process of depositing a thin layer of gold onto the surface of another material. It is an example of electroplating, where electricity is used to deposit a layer of one metal onto another.]**
ii) What are some common applications of electroplating mentioned in the case study? **[Hint-Common applications include manufacturing gold-plated jewellery and coating iron articles with zinc or chromium to prevent rusting and corrosion.]**
iii) Why is the disposal of used conducting solutions in electroplating factories an environmental concern? **[Hint-The used conducting solutions are classified as polluting waste. Improper disposal can harm the environment, so it is essential to follow strict disposal guidelines.]**
iv) Suggest one method to address the environmental issues caused by electroplating waste. **[Hint-One method is to treat the used conducting solutions in specialized waste treatment plants to neutralize harmful chemicals before disposal. This ensures they do not harm the environment.]**

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