



## CHAPTER 14

### CHEMICAL EFFECTS OF ELECTRIC CURRENT

#### SOLUTIONS:

#### EXERCISES

1. Fill in the blanks.

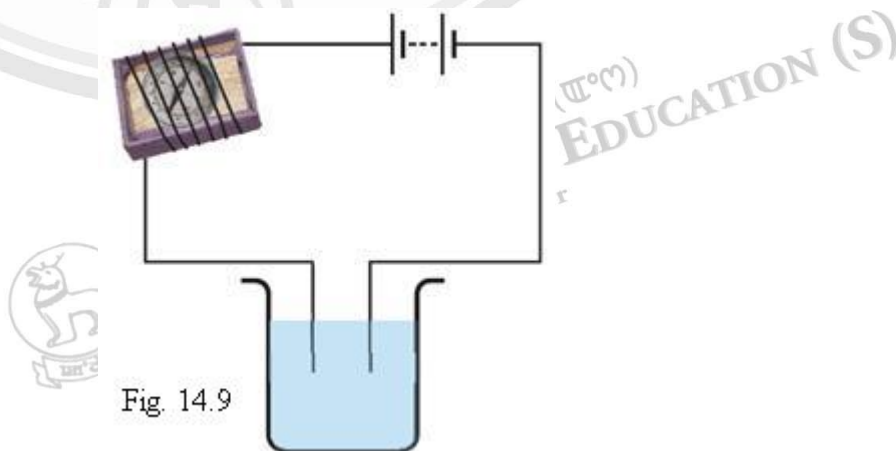
- (a) Most liquids that conduct electricity are solution of \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- (b) The passage of an electric current through a solution causes \_\_\_\_\_ effects.
- (c) If you pass current through copper sulphate solution, copper gets deposited on the plate connected to the \_\_\_\_\_ terminal of the battery.
- (d) The process of depositing a layer of any desired metal on another material by means of electricity is called \_\_\_\_\_.

Ans: (a) acid, bases, salts (b) chemical (c) negative (d) electroplating

2. When the free ends of a tester are dipped into a solution, the magnetic needle shows deflection. Can you explain the reason?

Ans. When the free ends of a tester is dipped into a solution, the magnetic needle show deflection means that the circuit of the tester becomes complete and the solution conducts electricity.

3. Name three liquids, which when tested in the manner shown in Fig.14.9, may cause the magnetic needle to deflect.



Ans. Lemon juice, Vinegar and tap water.

4. The bulb does not glow in the setup shown in Fig.14.10. List the possible reasons. Explain your answer.

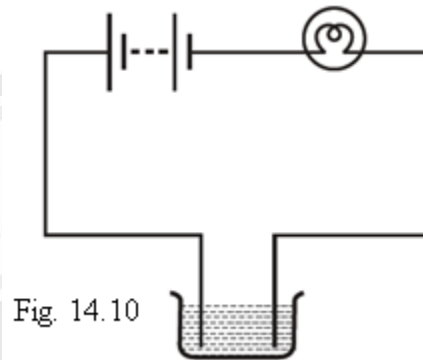


Fig. 14.10

Ans. The possible reasons that bulb does not glow are as follow

- (i) The liquid used may be poor conductor of electricity.  
If the liquid used is poor conductor then the circuit of the tester will be incomplete and the current does not pass through the liquid.
  - (ii) Even though the circuit is complete, the current through it may be too weak to make the bulb glow.
  - (iii) Presence of insufficient energy in the battery to generate electric current.
5. A tester is used to check the conduction of electricity through two liquids, labeled A and B. It is found that the bulb of the tester glows brightly for liquid A while it glows very dimly for liquid B. You would conclude that
- (i) liquid A is a better conductor than liquid B.
  - (ii) liquid B is a better conductor than liquid A.
  - (iii) both liquids are equally conducting.
  - (iv) Conducting properties of liquid cannot be compared in this manner.

Ans. (i) liquid A is better conductor than liquid B.

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

Ans. No, pure water does not conduct electricity as it does not contain salts. We can make it conducting by dissolving salt in it.

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

Ans. Water used in water hoses is not pure water and conducts electricity if it comes in contact with the electrical appliances. As water increases conductivity of electric current, this may hurt the fireman. Therefore, they shut off the main electrical supply for the area before they used the water hoses.

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

Ans. The compass needle of the tester deflects more in sea water than drinking water because sea water conducts better electricity than drinking water as sea water contains more amounts of dissolved salts than that of the drinking water.

9. Is it safe for the electrician to carry out electrical repairs outdoors during heavy downpour? Explain.

Ans. No, it is not safe for the electrician to carry out electrical repairs outdoors during a heavy downpour. Rain water contains dissolved salts making it a good conductor of electricity so it can cause electric shocks to the electrician while working outdoors during heavy downpour.

10. Paheli had heard that rainwater is as good as distilled water. So she collected some rainwater in a clean glass tumbler and tested it using a tester. To her surprise she found that the compass needle showed deflection. What could be the reason?

Ans. Rain water is pure water as distilled water but it gets mixed with the gases like sulphur dioxide and nitrogen oxides present in the atmosphere and forms an acidic solution, which is a good conductor of electricity. So, the compass needle showed deflection when tested using a tester.

11. Prepare a list of objects around you that are electroplated.

Ans. Electroplated objects are gold plated ornaments, door handles, taps, kitchen gas burner, rims of cycles, bicycle handlebars etc.

12. The process that you saw in Activity 14.7 is used for purification of copper. A thin plate of pure copper and a thick rod of impure copper are used as electrodes. Copper from the impure rod is sought to be transferred to the thin copper plate. Which electrode should be attached to the positive terminal of the battery and why?

Ans. The thick rod of impure copper plate is to be connected to the positive terminal of the battery because when electric current is passed through the copper sulphate solution, copper sulphate dissociates into copper and sulphate. The free copper, being positively charged, gets drawn to the electrode connected to the negative terminal of the battery and gets deposited on it. On the other hand the loss of copper from the solution is regained from the impure copper rod which is attached to the positive terminal of the battery.

### Extra Questions And Answers :

Q1. Why does the bulb glow, when the electric current is passed through it?

Ans. Due to the heating effect of current, the filament of the bulb gets heated to a high temperature and it starts glowing. Thus, the bulb glows when the electric current is passed through it.

Q2. What is the full form of LED?

Ans. The full form of LED is Light Emitting Diode.

Q3. Why is distilled water a poor conductor of electricity?

Ans. Because distilled water is free of salts. So, it is a poor conductor of electricity.

Q4. Name any two metals used for electroplating.

Ans. Chromium and gold.

Q5. How is the conductivity of liquids tested?

Ans. The conductivity of the liquids is tested by dipping the free ends of the tester in the liquid. If the liquid allows the electric current to pass between the two ends of the tester and the bulb glows then the liquid is said to be a good conductor. If not, then the liquid is an insulator or a poor conductor.

Q6. What happens when the copper wire of the tester is inserted into a potato?

Ans. When the copper wire of the tester is inserted into a potato, a greenish blue spot around the positive terminal of the tester is noticed but not on the negative terminal.

Q7. What is electroplating? Why is tin electroplated on iron to make cans used for storing food?

Ans. The process of depositing a thin layer of any desired metal on another material by means of electricity is called electroplating.

Tin is electroplated on iron because tin is less reactive than iron. Tin coating prevents the food from coming in contact with iron and thus prevents the food from getting spoiled.

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