

## Chemical effect of Electricity

Fill in the blanks.

- (a) Most liquids that conduct electricity are solutions 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 \_\_\_\_\_.

Answer:

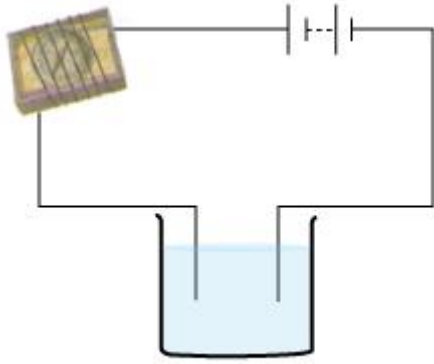
- (a) Most liquids that conduct electricity are solutions of acids, bases and salts.
- (b) The passage of an electric current through a solution causes chemical effects.
- (c) If you pass current through copper sulphate solution, copper gets deposited on the plate connected to the negative terminal of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

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

Answer:

The deflection in the compass needle shows that current flows through the wounded wire and hence, through the circuit. The circuit is complete since free ends of the tester are dipped in a solution. The solution is certainly a conducting solution. This is the reason why the compass needle shows a deflection.

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

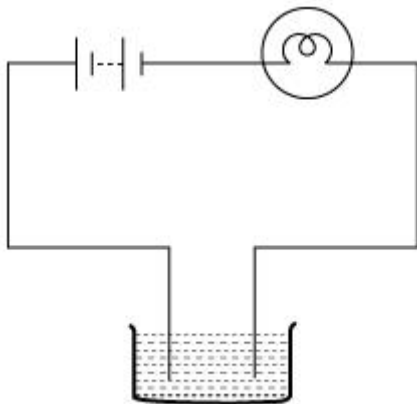


*Fig. 14.9*

Answer:

Liquids like saline water, lemon juice and vegetable oil allow electricity to pass through them. Hence, these liquids can be used as in the beaker to show the given effect.

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



*Fig. 14.10*

The bulb may not glow because of the following reasons:

- (i) Liquid in the beaker may be non-conducting. In such case, the electric current would not be able to pass through the liquid. Hence, the circuit is not complete.
- (ii) Electric current in the circuit is very weak. This can happen if the material used for making the circuit is not a good conductor of electricity or the battery does not have sufficient energy to generate electricity.

5 A tester is used to check the conduction of electricity through two liquids, labelled 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.

Answer (i)

The amount of current flowing through a conducting solution depends on the conductivity of the solution. With more conductivity, more current passes through the solution and vice-versa. Hence, the conductivity of liquid A is more than the conductivity of liquid B.

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

Answer:

No. Pure water does not conduct electricity because it does not furnish free ions. Pure water can conduct electricity when a pinch of common salt is added to it, as salt solution is conducting in nature.

7. 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:

Water may conduct electricity. If the electrical supply for the area is not shut off and water is poured over electrical appliances, then electricity may pass through water and harm the firemen. That is why, in case of a fire, the firemen shut off the main electrical supply for the area before they use the water hoses.

8. 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:

Sea water contains more dissolved salts than the drinking water. Hence, it is more conducting than the drinking water. Because of this reason, the compass needle deflects more in seawater than in the drinking water.

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

Answer:

No. It is not safe to repair electrical appliances outdoors during heavy downpour. This is because rain water contains dissolved salts. Therefore, rain water can conduct electricity. The electrician may get electrical shocks while working outdoors during rain.

**10. Paheli had heard that rain water is as good as distilled water. So, she collected some rain water 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 reasons?**

Answer:

Rain water contains dissolved salts. This makes it a conducting solution. There are no dissolved salts present in the distilled water. Hence, rain water can allow electricity to pass through it while distilled water cannot.

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

Answer:

Examples of electroplated objects are as follows:

(i) Iron used in constructing a building is coated with a layer of zinc. This protects iron from corrosion and rusting.

(ii) Chromium plating is done on different car parts, bath taps, kitchen gas, burners, bicycle handlebars, wheel rims and many to give them shiny appearance.

(iii) A fine layer of gold is deposited on the silver ornaments and they are called gold-plated ornaments.

**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 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?**

Answer:

Copper ion is positively charged. It is attracted towards the plate which is connected to the negative terminal of the battery. As copper ions are transferred to the thin copper plate, this thin pure copper plate must be connected to the negative terminal of the battery. Consequently, impure copper rod is connected to the positive terminal of the battery.

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