Chemical Effects of Electric Current

Q.1 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 _____.

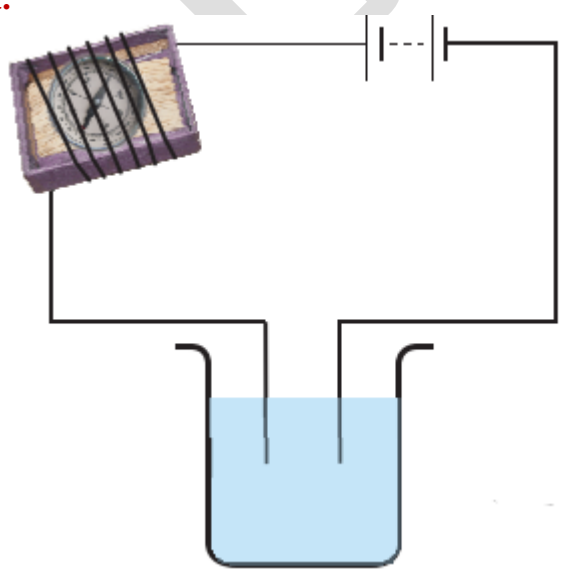
Sol:

(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**.

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

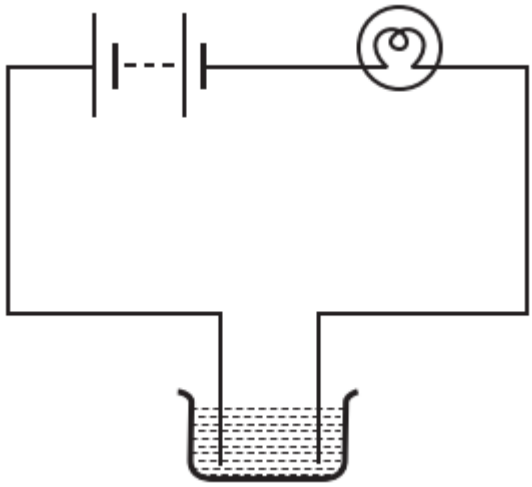
Sol: When the free ends of a tester are dipped into a solution, the magnetic needle shows deflection. This deflection in the compass needle shows that the circuit is complete since free ends of the tester are dipped in a solution. The solution is certainly a conducting the electricity.

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



Sol: Liquids like lemon juice, saltwater and vinegar allow electricity to pass through them.

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



Sol: If bulb is not glowing. There will be the following reasons:

(i) Liquid in the beaker may be non-conducting.
(ii) Electric current in the circuit is very weak.
(iii) Battery may be used up.
(iv) This bulb may be fused.
(v) Connecting wires may be loosed.

Q.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.

Sol: (i) liquid A is a better conductor than liquid B.

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

Sol: No, pure water does not conduct electricity. This is because pure water does not contains any ions. If we add a pinch of common salt it, then water will conduct the electricity.

Q.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.

Sol: Because water used in hoses is impure water. It may conduct electricity. So, the fire men shut off the main electrical supply for the area before they use the water hoses to save themselves and other people.

Q.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?

Sol: As all know that sea water contains lots of dissolved salts than the drinking water. Hence, it is more conducting than the normal water. That's why the compass needle deflects in seawater.

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

Sol: No, it is not safe for the electrician to repair electrical appliances outdoors during heavy downpour. Because rainwater contains lots of dissolved salts. Due to this, it can conduct electricity and electrician may get electrical shocks.

Q.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 reasons?

Sol: Yes it is correct that rain water is pure water which is an insulator but initially rainwater gets mixed with pollutants and forms acidic solution. This makes it a conducting solution. Therefore she found that the compass needle showed deflection.

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

Sol: Objects of electroplated objects are:

(a) Chromium plating is found on different parts of bicycle, cars, buses and motorcycles.
(b) A fine layer of gold on the silver ornaments.
(c) Iron is coated with a layer of zinc to protect from corrosion and rusting.

Q.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?

Sol: A thin plate of pure copper is connected to negative terminal and thick rod of impure copper is connected to positive terminals of the battery. When electric current is passes through copper sulphate solution, it gets converted into copper ion (Cu^{+2}) and sulphate ion (SO^{-2}_4). The Copper ion (Cu^{+2}) is positively charged. It is attracted towards the negative terminal of the battery. This Copper ions are transferred to the thin copper plate.