



Chemical Effects of Electric Current

Question 1.

What are good conductors?

Answer:

The substances that conduct electricity through them are called good conductors.

Question 2.

What are insulators or poor conductors?

Answer:

The substances that do not conduct electricity through them are poor conductors or insulators.

Question 3.

Give four examples of conductors.

Answer:

Copper, iron, aluminium and brass.

Question 4.

Give four examples of insulators.

Answer:

Air, wood, rubber and plastic.

Question 5.

Name two metal objects which have a coating of another metal.

Answer:

Handlebars of bicycles, bathroom taps.

Question 6.

What do we get on electrolysis of acidified water?

Answer:

Hydrogen and oxygen gas.

Question 7.

Is air a bad or good conductor?

Answer:

A bad conductor.

Question 8.

Which metal is plated on handle bars of cycles and rim of wheels?

Answer:

Chromium

Question 9.

What is the full form of LED?

Answer:

Light Emitting Diode.

Question 10.

How do we check the electric current?

Answer:

We check the electric current by using a tester.

Question 11.

Which part of an atom is responsible for flow of current?

Answer:

Electron

Question 12.

Why do most liquids conduct electricity?

Answer:

Due to the presence of ions in them, most liquids conduct electricity.

Question 13.

An LED is more efficient device than a bulb. Why?

Answer:

LED is more efficient because it can glow even when a weak or less current flows through it.

Question 14.

Do lemon juice or vinegar conduct electricity?

Answer:

Yes, they conduct electricity.

Question 15.

How is conductivity of liquids tested?

Answer:

By using a tester.

Question 16.

Is water from taps, handpumps, wells and ponds a good conductor?

Answer:

Yes, water from these sources is a good conductor.

Question 17.

What makes distilled water a good conductor?

Answer:

Salts when mixed with distilled water make it a good conductor.

Question 18.

Why is a layer of zinc coated over iron?

Answer:

To prevent iron from corrosion and rust.

Question 19.

Will the solution of sugar in distilled water conduct electricity?

Answer:

No

Question 20.

Why is tin electroplated on iron to make cans used for storing food?

Answer:

Tin is less reactive than iron. Tin coating prevents food from coming in contact with iron and thus prevents it from getting spoiled or corroded.

Question 21.

Why do we use chromium electroplating on taps and bars of bicycle instead of silver and gold?

Answer:

Silver and gold are very expensive comparatively to chromium.

Question 22.

What type of effect of current do the deposits of metal on electrodes show?

Answer:

Chemical effect

Question 23.

What effect of current does electroplating show?

Answer:

Chemical effect

Question 24.

Which effect of current causes the bulb to glow?

Answer:

Heating effect

Question 25.

Which part of the bulb glows?

Answer:

Filament

Question 26.

Name the three effects of electric current.

Answer:

Heating, magnetic and chemical effect.

Question 27.

How can the magnetic effect of current be checked?

Answer:

By using magnetic compass.

Question 28.

What do we see when the compass needle is brought near a wire in which current is flowing?

Answer:

The needle deflects.

Question 29.

What is electroplating?

Answer:

Deposition of thin layer of a metal over other metal by electrolysis is called electroplating.

Short Answer Questions

Question 1.

Define good conductors and poor conductors or insulators.

Answer:

The materials that conduct electricity through them are called good conductors whereas those that do not conduct electricity are called poor conductors or insulators. For example, copper, brass, aluminium, iron,

etc., are conductors whereas rubber, plastic, wood, air, etc., are insulators.

Question 2.

How is the conductivity of liquids tested?

Answer:

The free ends of the tester is dipped in the liquid. If the bulb glows, the liquid is said to be a conductor. If not, it is an insulator.

Question 3.

Show with the help of a diagram that lemon juice and vinegar are good conductors of electricity.

Answer:

When the ends of a tester is dipped in lemon juice or vinegar, the bulb glows. This process indicates that lemon juice and vinegar, both, are good conductors of electricity.

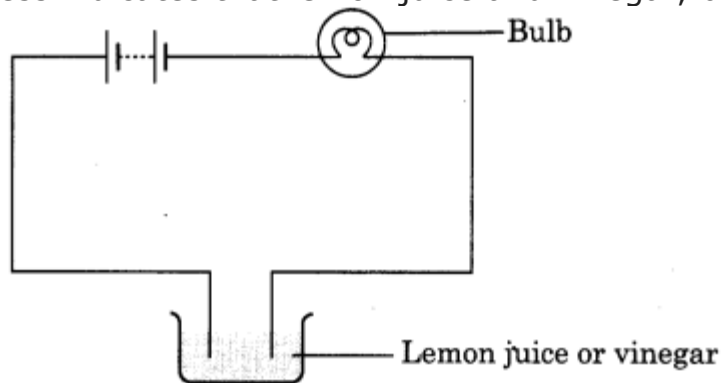


Fig. 14.8 Testing conduction of electricity in lemon juice or vinegar

Question 4.

What is an LED? Why is it preferred to other type of bulbs?

Answer:

The electric device which is used in the tester instead of bulb is an LED. Its full form is Light Emitting Diode.

It is preferred to other bulbs as it can glow even when weak or less current flows through it.

Question 5.

Explain the conductivity of water.

or

Normal water conducts electricity while the pure or distilled water does not. Explain why?

Answer:

Normal water that we get from sources such as taps, handpumps, wells, ponds, etc., is not pure. It may contain several salts dissolved in it naturally. This water is thus good conductor of electricity. The pure or distilled water is free of salts and is a poor conductor.

Question 6.

Give an example of chemical effect of the electric current.

Answer:

The passage of an electric current through a conducting solution causes chemical reactions as a result, bubbles of a gas are formed, or deposits of metal are seen on electrodes or changes in colour of solution ,

may occur. These are some of the chemical effects of electric current.

Question 7.

What is electroplating? What are its uses?

Answer:

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

Electroplating is a very useful process. This is used to make objects appear shiny and resistant to scratches. It prevents corrosion.

Question 8.

What happens when electric current is passed through the copper sulphate solution?

Answer:

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

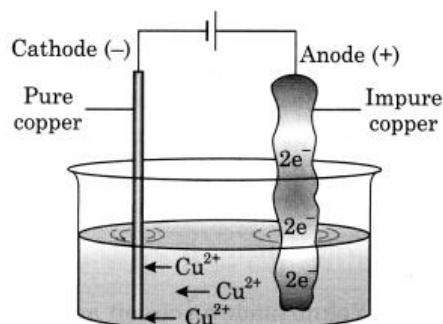
Question 9..

With the help of a suitable diagram, explain electrolytic refining of copper.

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.

Answer:



► Fig. 14.9 Electrolytic refining of copper

Question 10. Does water conduct electricity? Show with the help of an activity.
or Show the conductivity of water with the help of an activity.

Ans: 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.

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.

Question 11.

What is electroplating? On which effect of the electric current is it based? Why is it done?

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.

Question 12..

What are the advantages and disadvantages of electroplating?

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.
