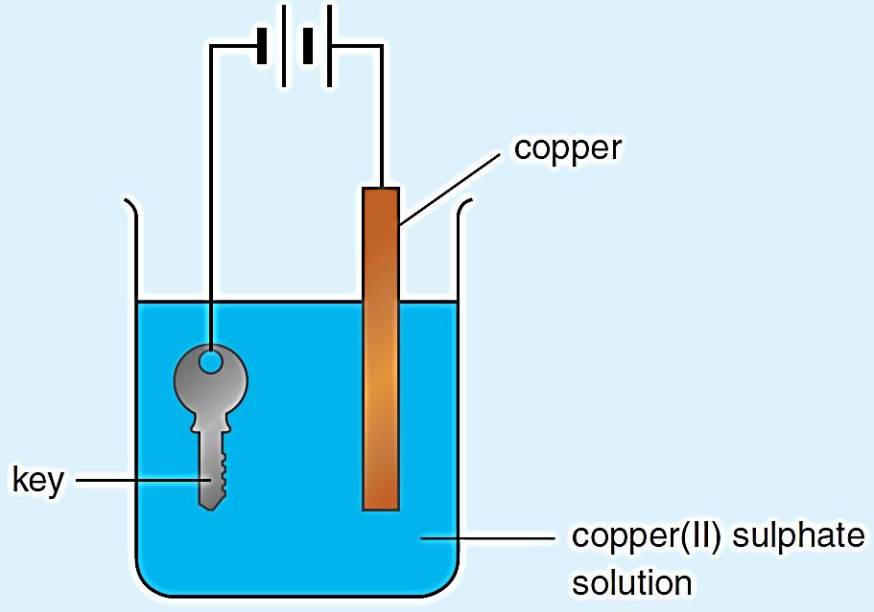
Quiz (Electroplating)

1. Lead(II) chloride is found in electroplating effluents. Describe how to remove the compound before discharge.

2. The following diagram shows a set-up for electroplating copper on a key.



(a) Identify the anode and the cathode in the above set-up.

(b) What would be observed at the copper electrode? Write a half equation for the reaction involved.

(c) What would be observed at the key? Write a half equation for the reaction involved.

(d) In a copper-plating factory, the effluents always contain copper(II) ions.
(i) Explain why copper(II) ions must be removed before discharge.
(ii) Describe how to remove the copper(II) ions with a chemical method.

Suggested Answer

1. Just filter off the lead(II) chloride from the effluents before the effluents are discharged.

2. (a) Anode: the copper electrode
Cathode: the key

(b) The copper electrode becomes smaller.
$Cu(s) \longrightarrow Cu^{2+}(aq) + 2e^-$

(c) The surface of the key becomes coated with a layer of brown solid.
$Cu^{2+}(aq) + 2e^- \longrightarrow Cu(s)$

(d) (i) Copper(II) ions are heavy metal ions. They cause serious water pollution and may kill the aquatic life.

(ii) Adding sodium hydroxide solution to the effluents. The copper(II) ions would be precipitated out as copper(II) hydroxide. The precipitate is then filtered off before discharge.