At the cathode zinc is reduced by the following reaction.

$Cu2+(aq) + 2e- \rightarrow Cu(s)$ (Standard electrode reduction potential +0.340 V)

Note that positively charged copper ions move towards the positive electrode, driven by a reduction in chemical energy.

The total reaction is:

$Zn(s) + Cu2+(aq) \rightarrow Zn2+(aq) + Cu(s)$ (Open-circuit voltage 1.1018 V)

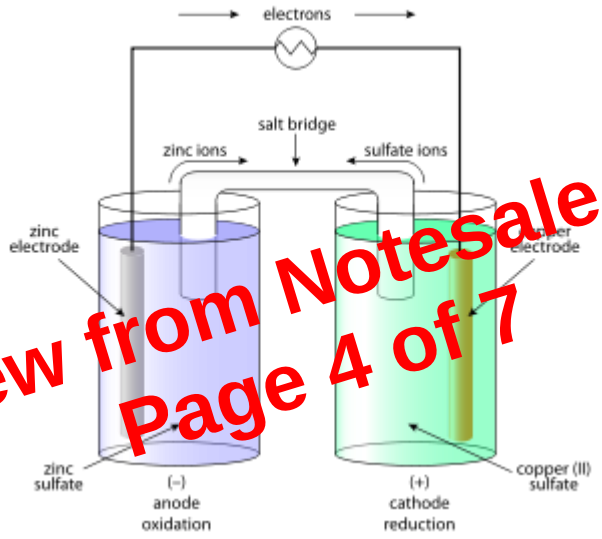

Figure:4

These processes result in the accumulation of solid copper at the cathode and the corrosion of the zinc electrode into the solution as zinc cations ,weaker bonding (smaller magnitude of the cohesive energy) in zinc compared to copper metal, which can be explained in terms of the lack of bonding via partially filled d-orbitals in zinc.

A form of the Daniell cell known as two half cells is often used due to its simplicity. The two half cells each support one half of the reactions described above. A wire and light bulb may connect the two electrodes. Excess electrons produced by the oxidation of zinc metal are “pushed” out of the anode, which is therefore the negative electrode, travel through the wire