

Electrochemical cell

By Narendra Sir

Electric Current

Electronic current is the flow of electronic charge through a medium. This charge is typically carried by moving electrons in a conductor such as wire.

Electrochemical cell

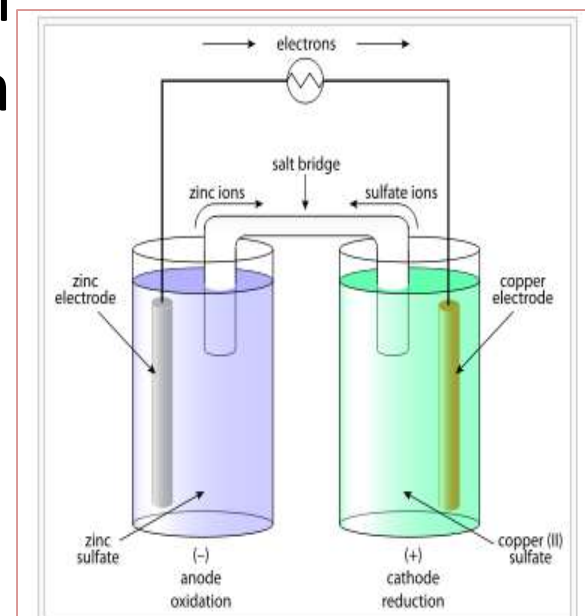
A cell is a device that converts the stored chemical energy into electrical energy under certain condition. Hence it is also called electro chemical cell. It is an energy storage device.

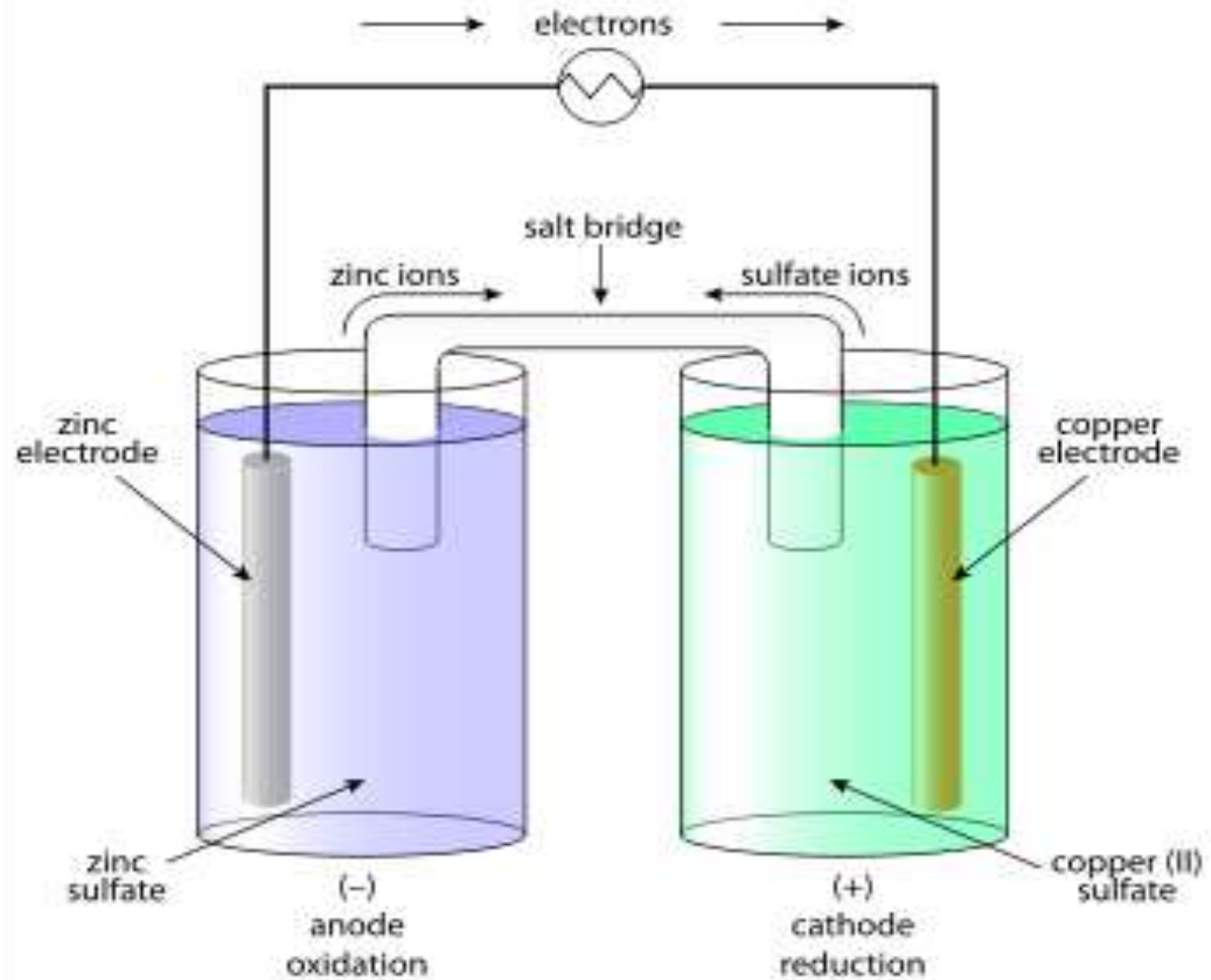
Types of electrochemical cell

- Simple cell (Volta's cell)
- The Leclanche cell
- The dry cell
- Nickel cadmium cell
- The button cell

Simple cell (Volta's cell)

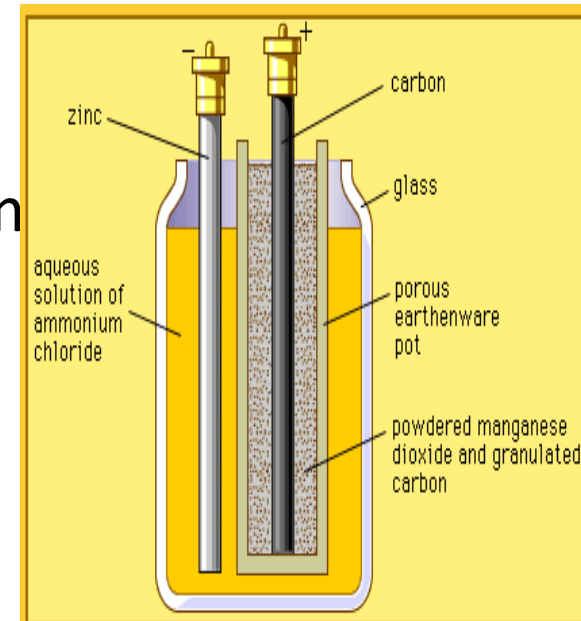
- Invented in 1799 by Alessandro Volta.
- The chemical reaction between sulphuric acid, zinc and copper causes an electric current to flow.
- When we connect the wires on both plates, the electrons will move from the zinc plate to the copper plate (electric current will flow).

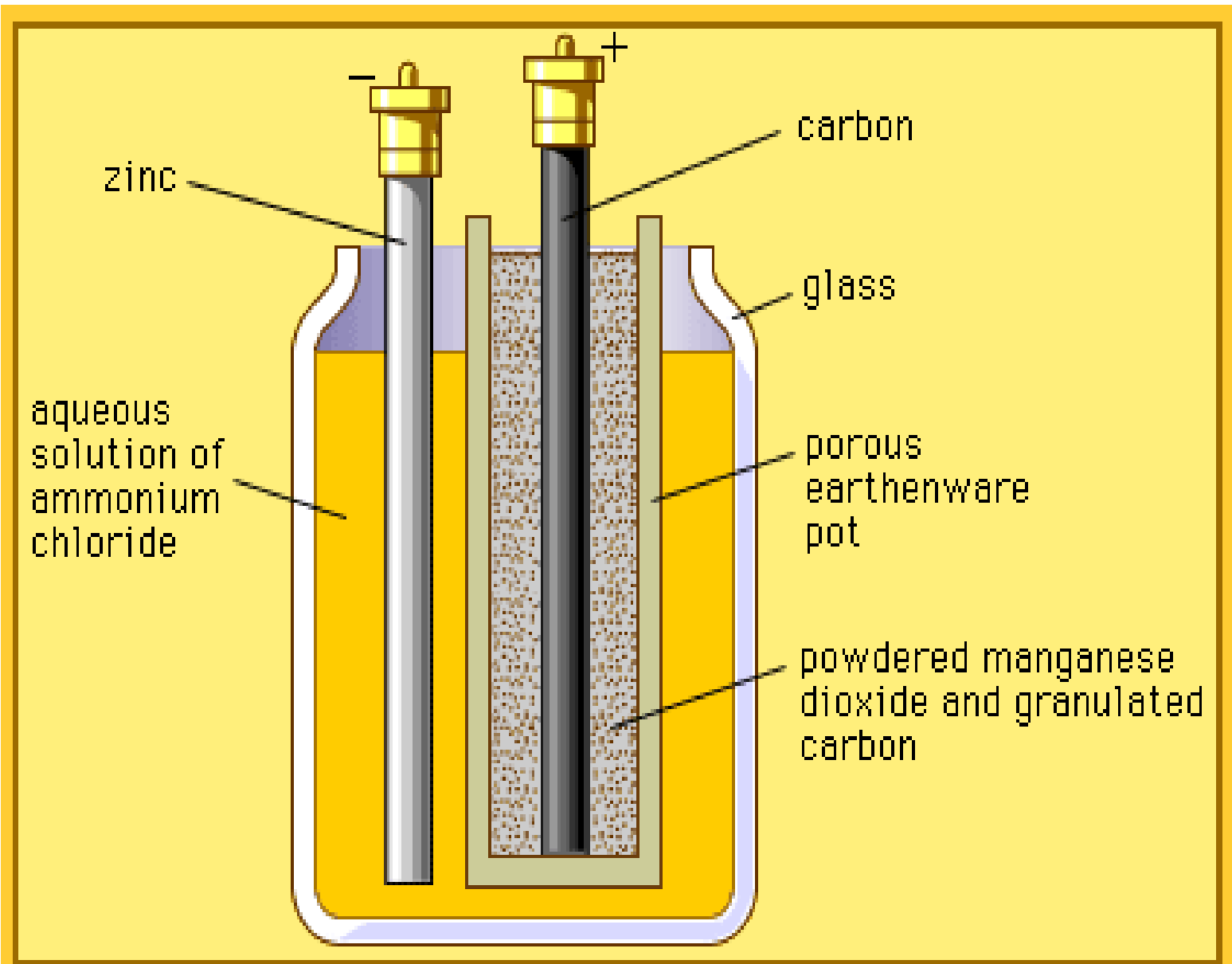




The Leclanche cell

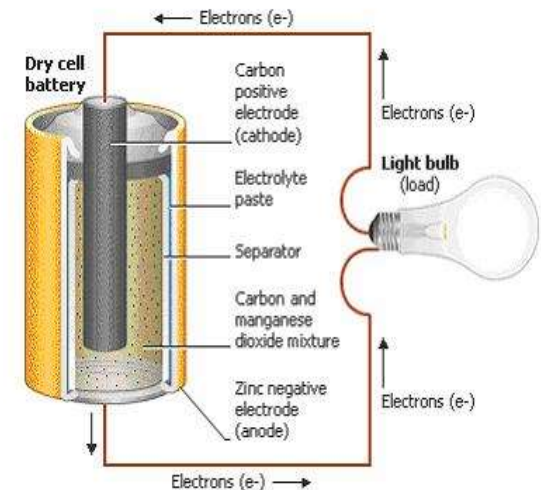
- Invented in 1866 by Georges Leclanche.
- The cell contained a conducting solution (electrolyte) of ammonium chloride a cathode (positive pole) of carbon.
- A mixture of manganese dioxide, and an anode (negative pole) of zinc.
- The chemical reaction between manganese dioxide, zinc and ammonium chloride causes an electric current will flow.

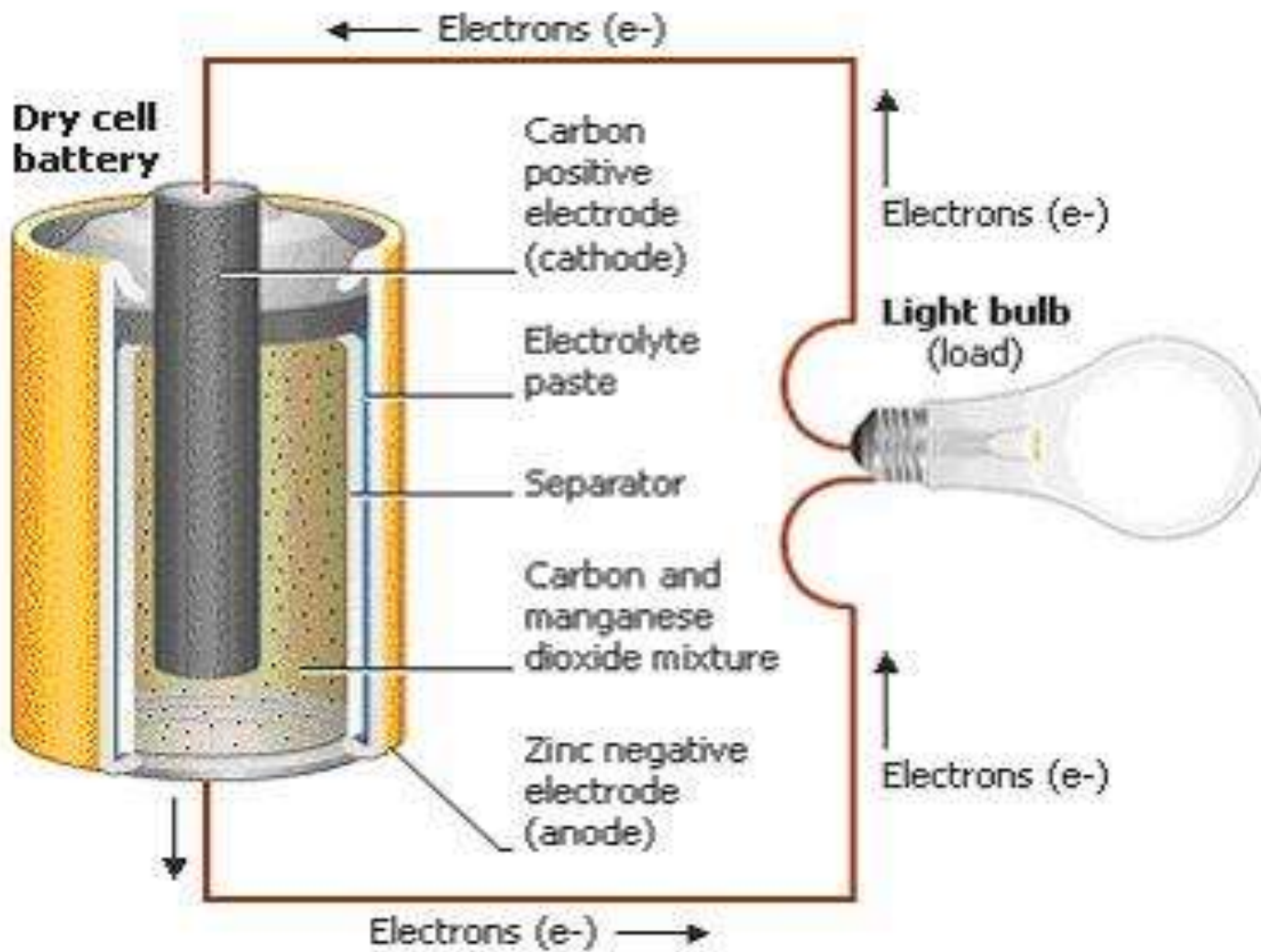




The Dry cell

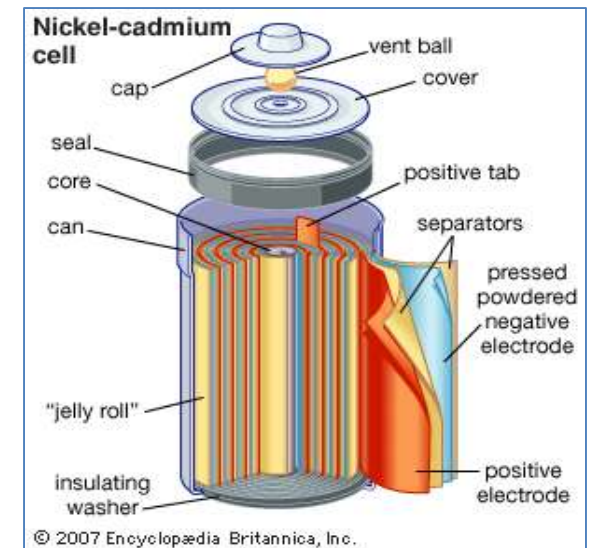
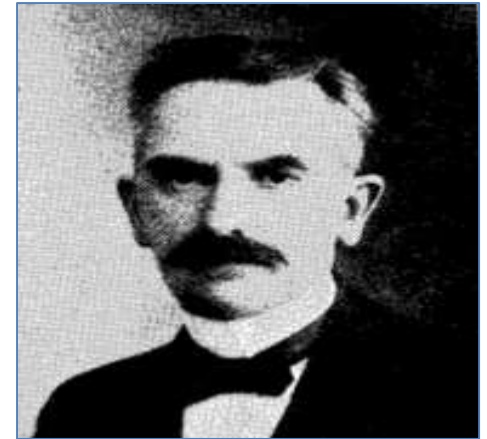
- Invented in 1888 by Carl Gassner.
- It has three components negative electrode (zinc chloride , ammonium chloride), positive electrode (carbon) and solution.
- When we connect the wires on both rods the electrons will move from zinc rod to carbon rod (electric current will flow).
- Dry cells are used in flash lights, handheld video games devices, cameras and clocks.



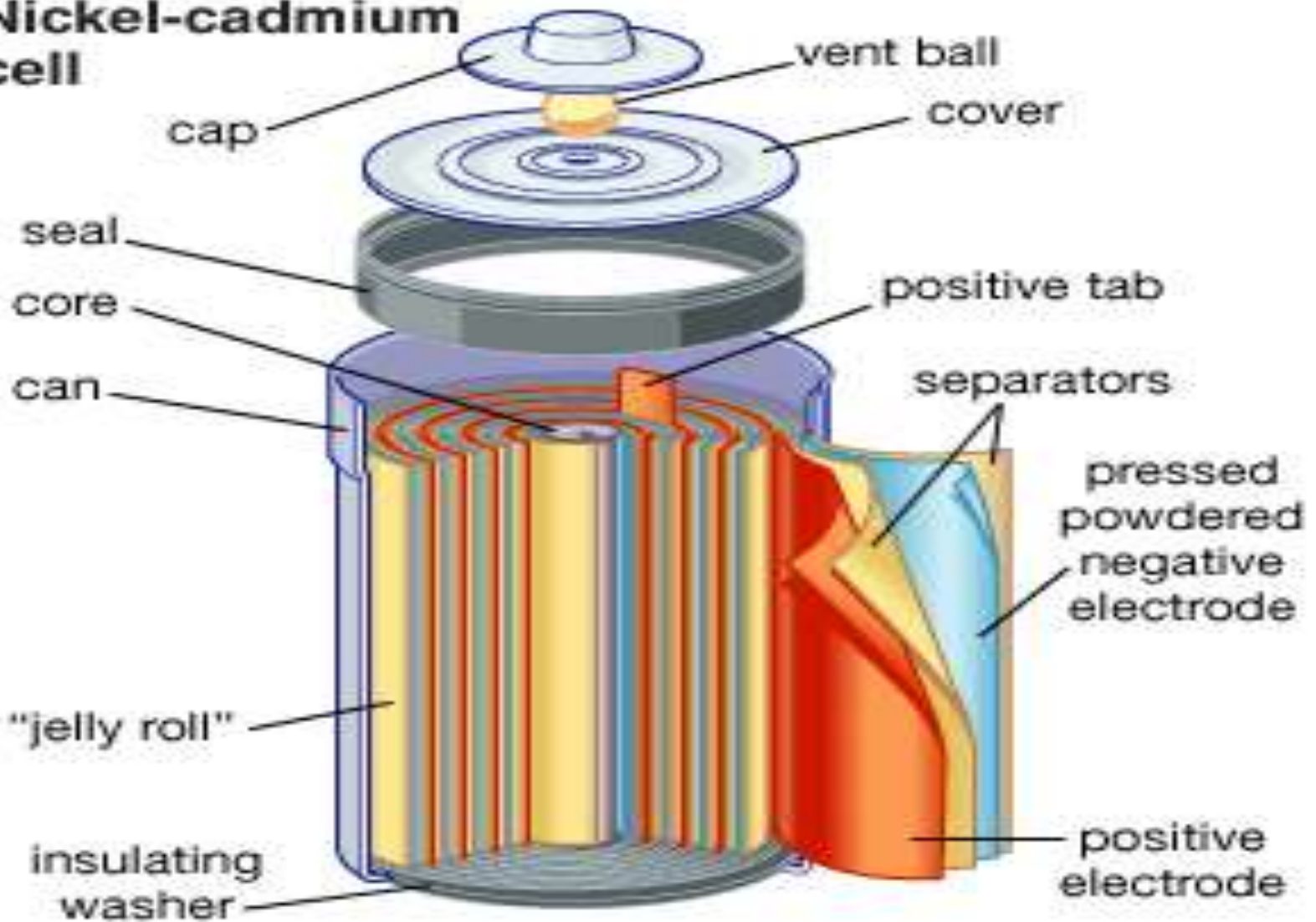


Nickel cadmium cell

- Invented in 1899 by Waldmar Jungner.
- In this cell, the metal cadmium (Cd) from the negative pole and nickel (Ni) and the positive pole.
- The space between the poles is filled with the alkali potassium hydroxide.
- It can be recharged.
- The cell is made air tight to prevent both leakage and corrosion in a recharge a battery.

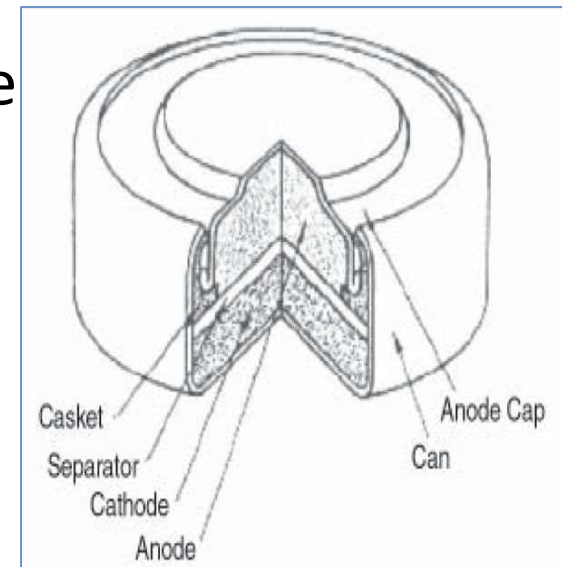


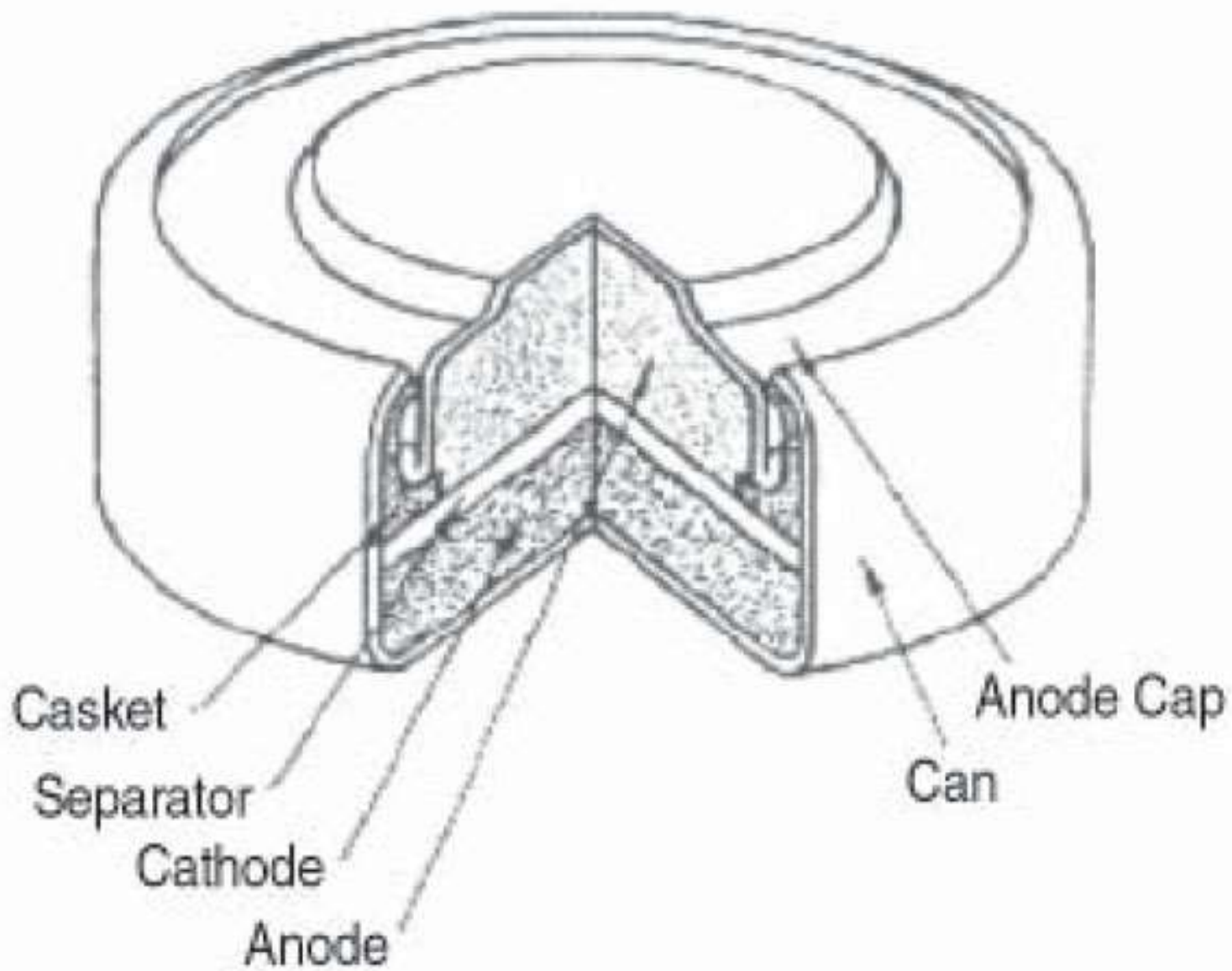
Nickel-cadmium cell



The button cell

- Invented in 1980 by John Goodenough.
- It is also called lithium cell.
- It has carbon as its positive pole and lithium iron phosphate as its negative pole.
- It is easy to use.
- It does not damage to the other delicate parts of the gadget because it does not leak.
- It cannot be recharged.





Disadvantages/user safety precautions

- Store the batteries on cool place.
- ESD (Electrostatic Discharge) Bags
- Do not put batteries into plastic bags designed to protect component from electrostatic discharge.
- Never reverse charge or overcharge with high currents.
- Never disassemble a battery and may damage skin and clothes.

Acknowledgements

- Images – goople.com
- Ref - Balbharati text book of SSC board std VIII.