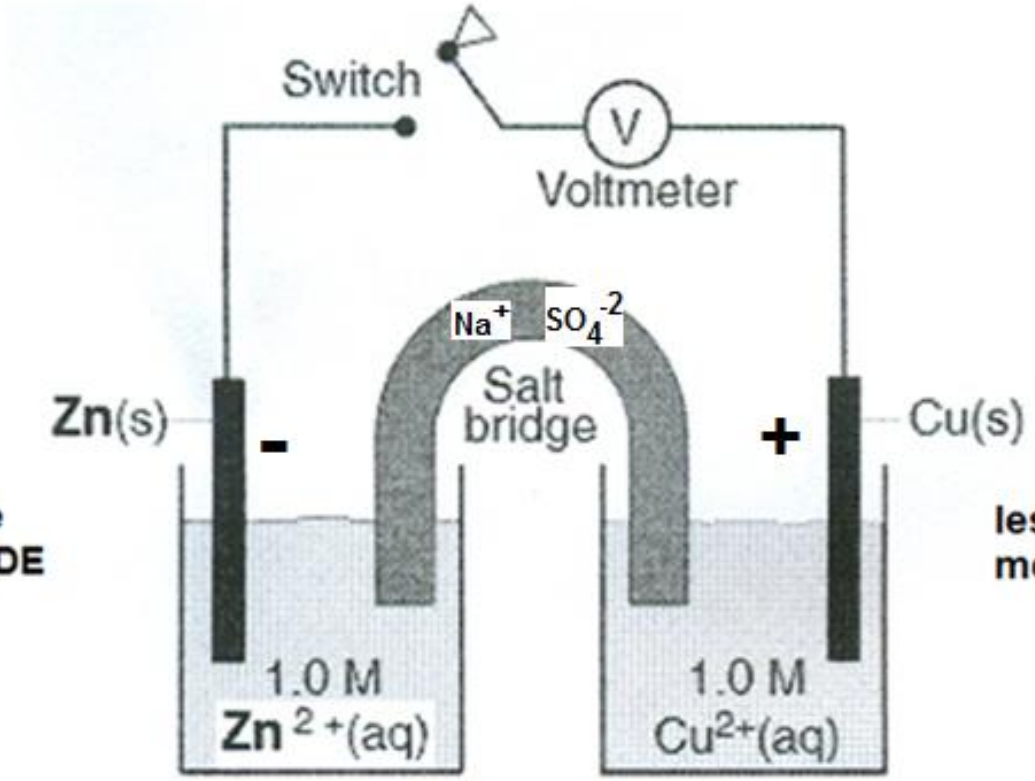
**VOLTAIC CELL 1**




more active metal, ANODE

less active metal, CATHODE

$$Zn\ (s) + Cu^{2+}(aq) \longrightarrow Zn^{2+}(aq) + Cu(s)$$

$$Zn \longrightarrow Zn^{2+} + 2e^- \quad | \quad Cu^{2+} + 2e^- \longrightarrow Cu$$

taken from electrode — going into solution — ** — coming out of solution — ** — added to electrode

** conducted by wire

## Voltaic Cell

a) It is possible to set up a redox reaction so that the oxidation and reduction half reactions occur in separate containers.

b) When they are connected by a metallic wire, electrons will be transferred through the wire from the species being oxidized to the species being reduced. This flow of electrons constitutes an electric current.

c) The complete system is called an Voltaic Cell. Each of the containers in which one half reaction is taking place is called a half-cell.

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**Components** of a Voltaic Cell:

a) two separate containers (half cells), each containing a metal electrode immersed in an aqueous solution of its salt

b) a wire connecting the two metal electrodes

c) a salt bridge - a glass U-tube containing an aqueous solution of any salt, whose ions don't interfere with the reactions at either electrode, connecting the two half cells; the salt bridge maintains electrical neutrality in the half cells by allowing ions to migrate from one cell to the other.

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**Electrodes**

anode = the electrode where oxidation takes place. In a Voltaic Cell the anode is (-).

cathode = the electrode where reduction takes place. In a Voltaic Cell the cathode is (+).

Electrons flow through the wire from the anode (-) to the cathode (+) because of the potential difference (voltage) between the two electrodes. The voltage is a measure of the free energy that drives the redox reaction.

Remember: an ox & red cat = anode, oxidation & reduction, cathode

**ELECTRONS FLOW SPONTANEOUSLY FROM THE MORE ACTIVE METAL TO THE LESS ACTIVE METAL.**