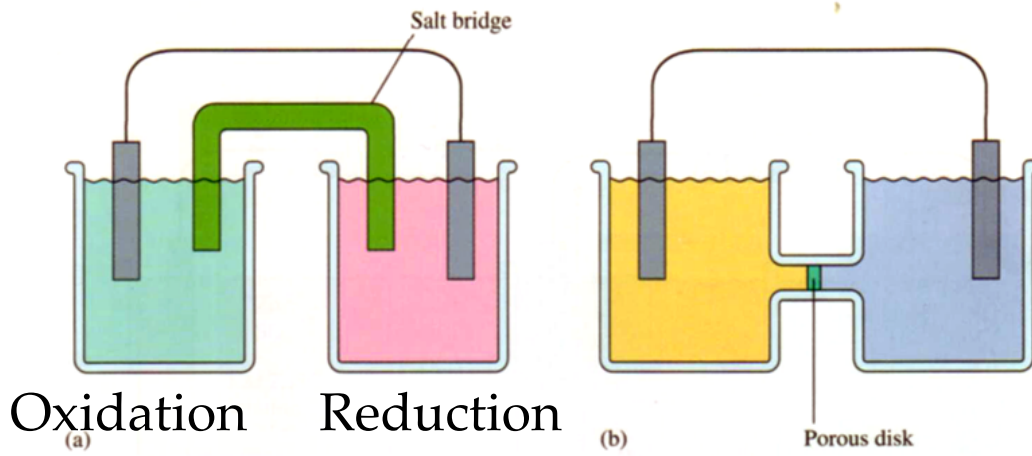
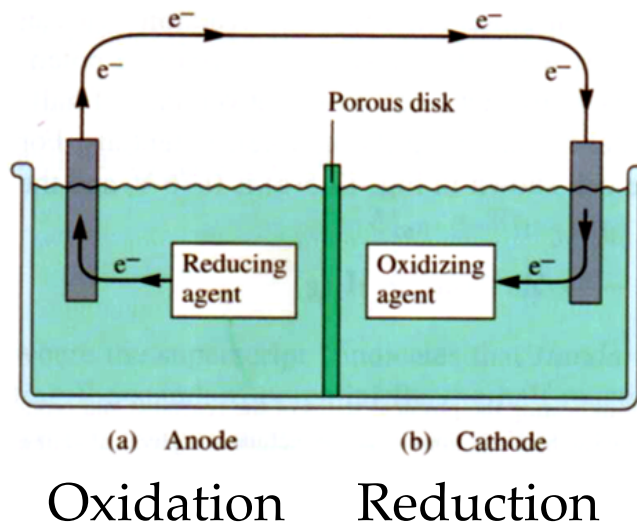


Electrochemistry

Electrochemistry is the study of the relationship between chemical energy and electrical energy. The basis for this relationship is oxidation-reduction chemistry, by separating the two halves of a red-ox reaction we can convert chemical energy into electrical energy. Such a device is called a galvanic cell.

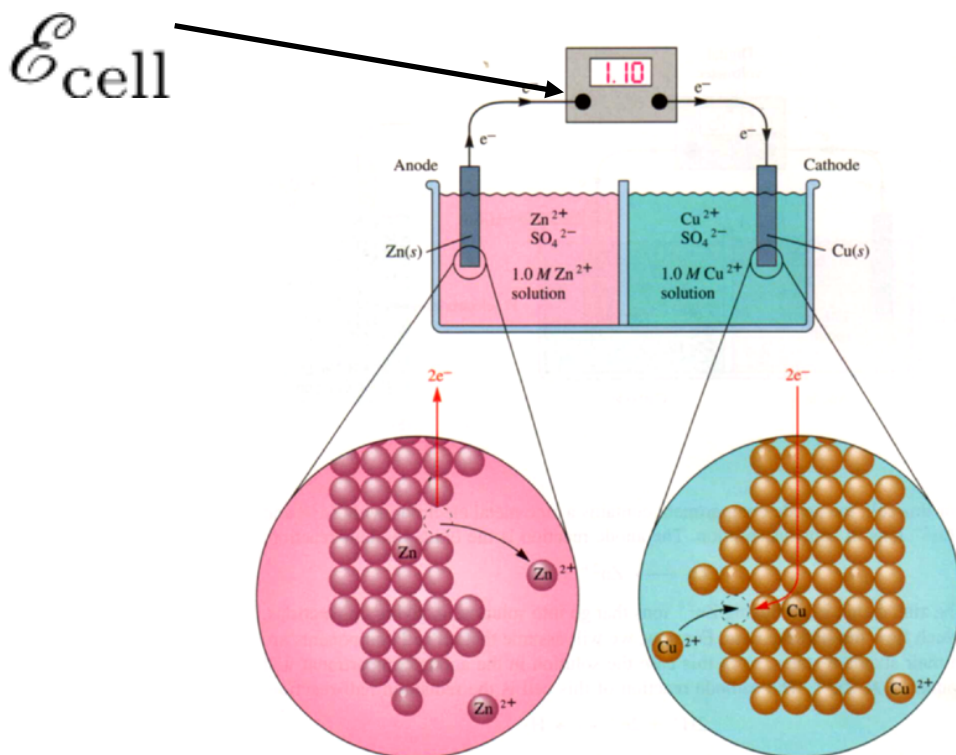


Galvanic Cells



Cell Potential

The first thing we want to measure in a galvanic cells is how strongly are the electrons being pulled through the wire. That is what is the voltage or cell potential. We can use a digital voltmeter to measure the cell potential.

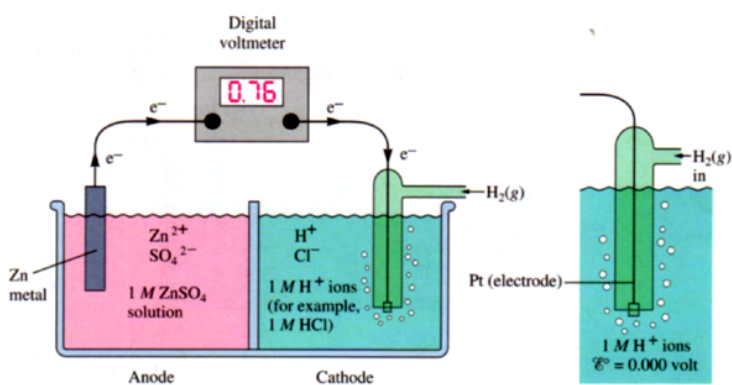


Standard Reduction Potential

By measuring a whole series of different reactions against a standard we can calculate the cell potential without going into the lab and measuring it. We call these reference values standard reduction potentials. There are two steps in using standard potentials.

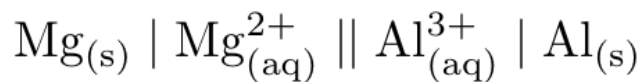
1-The reaction with the more negative standard potential is reversed, which changes the sign.

2- The two voltages are added. The number of electrons gained and lost needs to be balanced, this does not change the voltage.



Line Notation

We use line notation as a shorthand to describe the components of a galvanic cell. Line notation list the components of the anode on the left and the components of the cathode on the right. A single vertical line indicates a phase change and a double line separates the left and right.



When describing a galvanic cell there are four important considerations.

- 1- The cell potential and balanced reaction.
- 2- The direction of electron flow.
- 3- The anode and cathode.
- 4- The ions in solution and the material of the electrodes.

Ex: