Electrochemical Cells – virtual lab (for students who have missed the wet lab)

Objectives:

1. To become familiar with the construction and parts of an electrochemical cell
2. To predict the reactions and voltages that should result
3. To construct three electrochemical cells and measure their voltages
4. To observe the effect of non-standard conditions on voltage

Procedure – go to the link <http://www.kentchemistry.com/moviesfiles/Units/Redox/voltaiccelll20.htm> (available on Electrochemistry section of my website)

Predict the reactions that will occur (reduction/oxidation), which electrode will be the anode/cathode, and the voltage for each of the following combinations of metals. Note that each metal should be placed in a solution of its own ion (i.e. Zn in Zn2+, etc)

Ag/Cu

Ag/Zn

Cu/Zn

Now “construct” each of the cells and measure the resulting voltage. For each cell you construct, sketch the cell, showing:

* The direction of electron flow in the wire
* The direction of ion flow in/through the salt bridge
* Which electrode is gaining mass
* Which electrode is losing mass
* Which electrode is the cathode (and its charge)
* Which electrode is the anode (and its charge)

Go back to my website and follow the link to the virtual lab with concentrations (or go to <http://www.kentchemistry.com/moviesfiles/Units/Redox/VoltaicCellEMF.htm>)

Choose a combination of metals and their respective solutions (each 1.0M) that gives a spontaneous reaction, then try altering the concentration of one solution. Record what happens to the voltage. Try altering the concentration of the other solution. Are the results the same?

Be prepared to discuss this lab in an oral lab setting.