Name:_____Period:_____Date:_____

# ELECTROCHEMISTRY ONLINE LABS

**Section 1. Activity Series**

http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/redox/home.html

**Activity 1**

To start the animation click start and then activity one. You will see four ionic solutions. Pick one of the four metals and follow the instructions on the screen. Please write down your observations (e.g. what reactions occurred) Repeat this procedure for the other three metals and make sure to write all your observations down. Make sure to look at the macroscopic results and the molecular level results.

| | $Mg(NO_3)_2$ (aq) | $Zn(NO_3)_2$ (aq) | $Cu(NO_3)_2$ (aq) | $AgNO_3$ (aq) |
|---|---|---|---|---|
| Mg | | | | |
| Cu | | | | |
| Zn | | | | |
| Ag | | | | |

1. Which of the four metals you tested is the most reactive? Explain why.

2. Which is the least reactive? Why?

3. List the metals in order of increasing reactivity.

4. Locate the magnesium, zinc, copper, and silver in the standard reduction potential table. Is there a pattern between the reactivity of metals and the table? Explain.

## Section 2. Electrochemical cells

Oxidation: A process in which a substance loses one or more electrons
Reduction: A process in which a substance gains one or more electrons
Anode: an electrode at which oxidation occurs
Cathode: an electrode at which reduction occurs

### Activity 2

http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/electroChem/voltaicCell10.html

1. Begin by assembling a zinc-copper cell. Please be sure to follow the instructions on the screen.
2. Is there electron transfer between the two species (elements)?

3. Which species is losing electrons? gaining electrons?

4. Write the oxidation ½ reaction.

5. Write the reduction ½ reaction.

6. Which species is the anode? the cathode?

7. Is this a spontaneous reaction? Explain your reasoning.

8. Write the complete balanced equation for the reaction.

9. Set up a new cell using different elements. Write the balanced equation and the $E^0$.

10. Is this reaction spontaneous? why?