

Name _____ Period _____

Partner _____ Date _____

Electrochemical Cell Lab

Prelab Questions

- 1) What is an electrochemical cell?

- 2) What is the difference between Cu and Cu²⁺?

- 3) What half reaction occurs at the positive electrode?

Procedure

- 1) Wear goggles and follow all safety rules.

- 2) Clean strips of Mg, Cu, and Zn with sandpaper. Be careful not to cut yourself. Using a 24-well microplate put 20 drops of solution per well to set up three pairs of wells containing
 - Cu²⁺ (aq) in one well and Zn²⁺ (aq) in the adjacent well
 - Cu²⁺ (aq) in one well and Mg²⁺ (aq) in the adjacent well
 - Zn²⁺ (aq) in one well and Mg²⁺ (aq) in the adjacent well

- 4) In the first set place a piece of the Cu into the Cu²⁺, and a piece of Zn into the Zn²⁺.

- 5) Use forceps to remove a strip of filter paper from the beaker of salt water solution in which the filter paper is soaking. Drape one of these strips over the wall that separates each pair of ionic solutions so that one end of the filter paper is in one of the solutions and the other end is in the other solution.

- 6) Attach the alligator clips of the two wires from the voltmeter to the metal strips of the electrochemical cell to be tested. If the meter does not indicate a positive EMF, reverse the hookup so that each clip is now attached to the other metal in the pair. Record the voltage of this electrochemical cell as well as your observations of the reaction.

- 7) Keeping the clips attached, remove the filter paper strip. Observe what happens to the voltage. Repeat for the other two electrochemical cells.

- 8) Clean up!

Data

Metals	Voltage	Voltage without Salt Bridge	Positive Electrode	Observations/ Evidence of Reaction
Zn and Cu				
Cu and Mg				
Zn and Mg				

Post Lab Questions

Cell	Zn/Cu	Zn/Mg	Cu/Mg
Oxidized			
Reduced			
Oxidizing Agent			
Reducing agent			
Anode			
Anode Half Reaction			
Cathode			
Cathode Half Reaction			
Theoretical EMF			

- 1) What purpose does the moist filter paper serve?
- 2) Explain why removing the filter paper strip has the effect it does.
- 3) Why does it have to be moist?
- 4) Of the three ions used, which is the best oxidizing agent?
- 5) Which of the three is the least effective oxidizing agent?
- 6) Arrange the ions in order from best to worst oxidizing agents.
- 7) Why are the EMFs for your cells different than the theoretical?
- 8) Could you somehow calculate the E for your cell based on the E° ?