

Prelab Assignment – Experiment 5: Electrochemistry

1. Consider the voltaic cell $\text{Fe} \mid \text{Fe}^{+2} (1 \text{ M}) \parallel \text{Cu}^{+2} (1 \text{ M}) \mid \text{Cu}$
 - a. What two reactions occur in this voltaic cell?
 - b. Using Appendix E or Table 20.1 of your textbook, find the standard reduction potential of each reaction.
 - c. Calculate the standard cell potential.

2. The following data were obtained for the voltaic cell:
 $\text{Pb} \mid \text{Pb}^{+2} (1 \text{ M}) \parallel \text{Cu}^{+2} (1 \text{ M}) \mid \text{Cu}$
 - a. Convert the measured cell potentials into ΔG at each temperature.
 - b. If you were to plot ΔG versus T (in Kelvin), the value of the y-intercept is equal to what thermodynamic property? The slope of the graph is equal to what thermodynamic property?

| Measured Cell Potential (V) | Temperature (°C) |
|-----------------------------|------------------|
| 0.464 | 25 |
| 0.468 | 35 |
| 0.473 | 45 |