

+ WS 11.2 Electrochemistry & Voltaic Cells

1. What is a *standard hydrogen electrode*? _____
Why was it assigned a value of 0.00 V? _____
What, exactly, does E^0 mean? _____
Substances with positive E^0 values, like F_2 , are easier to be oxidized or reduced? _____
Substances with negative E^0 values, like Li, are easier to be oxidized or reduced? _____
2. Consider a voltaic cell containing Fe in a solution of $Fe_2(SO_4)_3$ and Cu in a solution of $CuSO_4$.
 - a. Write the half-reaction for the anode (oxidation):
 - b. Write the half-reaction for the cathode (reduction):
 - c. Use the shorthand method to represent this cell:
 - d. Calculate the cell potential:
3. Consider a voltaic cell containing Al in a solution of $Al(NO_3)_3$ and Mg in a solution of $Mg(NO_3)_2$.
 - a. Write the half-reaction for the anode (oxidation):
 - b. Write the half-reaction for the cathode (reduction):
 - c. Use the shorthand method to represent this cell:
 - d. Calculate the cell potential:
4. Consider a voltaic cell containing Pb in a solution of $Pb(NO_3)_2$ and Zn in a solution of $Zn(NO_3)_2$.
 - a. Write the half-reaction for the anode (oxidation):
 - b. Write the half-reaction for the cathode (reduction):
 - c. Use the shorthand method to represent this cell:
 - d. Calculate the cell potential:
5. Calculate the cell potential for the following cell: **Sn | Sn^{2+} || Ag^+ | Ag**
6. Determine which of these redox reactions will occur spontaneously & calculate the cell potential for each:
 - a. $Cu + H^+ \rightarrow Cu^{2+} + H_2$
 - b. $Ag + Fe^{2+} \rightarrow Ag^+ + Fe$
 - c. $Zn^{+2} + Cr \rightarrow Zn + Cr^{3+}$