 ΔG = ΔG° + RT Ln Q ℰ = ℰ° − 0.0592log Q ΔG = −n **F ℰ**

 n

 **F** =96500 coul/mol e-

\_\_\_\_\_\_5. Which of the following is the strongest reducing agent? A) Al B) Ni C) Zn

 D) Fe 2+

\_\_\_\_\_\_6. What is the standard electrical potential, ℰo, for the reaction

 Zn + 2 Ag+(aq) → Zn2+(aq) + 2 Ag ?

 A) 1.56 volts B) 2.36 volts C) 0.040 volts D) –0.040 volts

\_\_\_\_\_\_9. Given that the standard potential for the reaction

 Pb(s) + 2 Ag+(aq)→ 2 Ag(s) + Pb2+(aq) is 0.93 volts, what is the standard reduction potential of Pb2+ ?

\_\_\_\_\_\_\_\_18. Which of the metals listed below, will NOT react spontaneously

 with 1.00 molar HCl ? A)Zn B) Na C) Ag D) Al

III. Balance in acidic media: Show both balanced half reactions, and indicate which is the oxidation. MnO4– (aq) + CH3OH (aq) → Mn2+(aq) + HCOOH(aq)

IX. A standard chemical cell is constructed using 1.00 molar solutions of Ni(NO3)2 and Zn(NO3)2 , zinc metal, and nickel metal.

 A. Draw a labeled diagram of the cell. Indicate on your diagram

 1. the direction of electron flow through the connecting wire

 2. The + pole

 3. The cathode

 ( 6 pts)

B. (answer “increases,” “decreases” or “remains the same.”

( 4 pts)

 1. When additional solid Ni(NO3)2 is dissolved in the nickel half cell,

 the voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 2. If the size of the zinc electrode is increased, the voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 C. Write a balanced equation for the reaction that occurs in this cell. ( 2 pts)

 D. Find *E*o for the cell, in volts. ( 2 pts)

 E. Find ΔGo for the reaction you wrote in part C. ( 2 pts)

 F. Find the voltage produced by this cell when the Zn2+ is 1.99 molar, and the

 [Ni2+] is 0.0100 molar ( 3 pts)



Nickel is immersed in Ni2+, 1 molar solution, ( Ni(NO3)2 and the Cu in 1 M Cu2+ ( Cu(NO3)2

Draw an arrow indicating the flow of electrons. Draw another indicating the movement of the + ions in the salt bridge. As this cell runs, one of the colors gets deeper, and the other paler. Why?