Exercise 9.5
Nonstandard Potential for Electrochemical Cells: The Nernst Equation!

1. Calculate the potential for the following electrochemical cell operating at 1 bar pressure and 298.15 K:

$$Mn_{(s)}\left|Mn^{2+}_{(aq)}(0.0375\ M)\right\|Pb^{2+}_{(aq)}(0.0125\ M)\left|Pb_{(s)}\right.$$

2. The following electrochemical cell is observed to have a potential of $+0.3696\ V$. Calculate the standard reduction potential of $Cu^{2+}_{(aq)}$.

$$Cu_{(s)}\left|Cu^{2+}_{(aq)}(0.067\ M)\right\|Ag^{+}_{(aq)}(0.0084\ M)\left|Ag_{(s)}\right.$$

3. Consider the following electrochemical cell operating at 1 bar pressure and 298.15 K:

$$Zn_{(s)}\left|Zn^{2+}_{(aq)}(0.024\ M)\right\|Zn^{2+}_{(aq)}(0.042\ M)\left|Zn_{(s)}\right.$$

(a) Without performing any calculations, would you expect this cell to have a standard potential that is positive, negative or zero? Why?

(b) Without performing any calculations, would you expect this cell to have a potential that is positive, negative or zero? Why?

(c) Calculate the potential for this electrochemical cell.