Voltage

Directions
Use the Standard Reduction Potentials Table and the half-reaction method to calculate voltage.

1. Calculate the voltage produced under standard conditions by a voltaic cell made of a silver electrode in an Ag^{+} solution in one-half cell and an aluminum electrode in an Al^{3+} solution in the other half-cell.
2. A voltaic cell is built using electrodes based on the following half-reactions:

   $Sr^{2+} + 2e^{-} \rightarrow Sr$
   $Fe^{2}+ \ 2e^{-} \rightarrow Fe$

   a. What is the anode and what is the cathode in the cell?
   b. What is the electrode potential of the voltaic cell?
3. Calculate the electrode potential of the voltaic cell produced by a standard voltaic cell consisting of a nickel electrode in contact with a solution of Ni^{2+} ions and a silver electrode in contact with a solution of Ag^{+} ions.
4. What is the voltage produced by a voltaic cell consisting of an aluminum electrode in contact with a solution of Al^{3+} ions and an iron electrode in a solution of Fe^{2+} ions?
5. A voltaic cell is constructed using electrodes based on the following half-reactions:

   $Pb^{2+}(aq) + 2e^{-} \rightarrow Pb(s)$
   $Mn^{2+}(aq) + 2e^{-} \rightarrow Mn(s)$

   a. What is the anode and what is the cathode in the cell?
   b. What is the electrode potential of the voltaic cell?

Answer Key
1. 1.676V + 0.799 V = 2.475 V; 2. anode=Sr, cathode = Fe, 2.89 V + (-0.44 V) = 2.45 V
3. 0.257 V + 0.799 V = 1.056 V 4. 1.676 V + (- 0.44 V) = 1.236 V
5. a. anode = Mn, cathode = Pb b. 1.18V + (-0.13 V) = 1.05 V