

Voltage

Directions

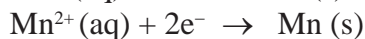
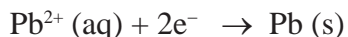
Use the Standard Reduction Potentials Table and the half-reaction method to calculate voltage.

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:



- 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:



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