CHM 112 (Quiz 10)

Name_____ Section_____

Show all work and draw a box around your final answer.

1. A galvanic cell is to be prepared from an aluminum electrode, a silver electrode, and one molar solutions of $Al(NO_3)_3$ and $Ag(NO_3)$.

$Al^{3+}\ (aq) + 3e^- \longrightarrow Al\ (s)$	$\varepsilon^\circ = -1.676$ V
$Ag^{+}\ (aq) + e^- \longrightarrow Ag\ (s)$	$\varepsilon^\circ = +0.800$ V
$Ag^{2+}\ (aq) + e^- \longrightarrow Ag^{+}\ (aq)$	$\varepsilon^\circ = +1.980$ V

   a. Draw the electrochemical cell with all necessary components. Clearly label the electrodes, solutions, potentiometer, salt bridge, etc.

   b. Using standard reduction potentials, determine which electrode is the anode and which electrode is the cathode. Label these on your diagram above.

   c. On your diagram label the direction of electron flow.

   d. Write a balanced chemical equation for the cell reaction which is spontaneous as written.

   e. Now diagram the cell using **standard cell notation**.

f. A current of 1.75 A is observed to flow through the wire for 2.5 hours. How many moles of electrons pass through the wire during this time?

g. Which electrode gains mass: Ag or Al (circle one)?

h. The electrode that decomposes initially weighs 20.00 grams. What is its mass after the 1.75 A current flows for 2.50 hours.