SCH4U1 Name:
ECH06 Date:

Electrochemical Cells - Worksheet

1. Given the reaction:

   $Cd_{(s)} + 2\ AgNO_{3\,(aq)} \rightarrow Cd(NO_3)_{2\,(aq)} + 2\ Ag_{(s)}$

   a. Draw and label the electrochemical cell (salt bridge design).
   b. How many grams of $Cd_{(s)}$ would have to dissolve (react) if 2.00 g of silver metal forms on the electrode.

2. Could an electrochemical cell be based on the following reaction? If so, draw and label the cell (salt bridge design), include the appropriate half-reactions. If not, explain why.

   $3\ Ag_{(s)} + Au(NO_3)_{3\,(aq)} \rightarrow 3\ AgNO_{3\,(aq)} + Au_{(s)}$

3. Could an electrochemical cell be based on the following reaction? If so, draw and label the cell (salt bridge design),include the appropriate half-reactions. If not, explain why.

   $Ag^{+}_{(aq)} + NO_3^{-}{}_{(aq)} + K^{+}_{(aq)} + Cl^{-}_{(aq)} \rightarrow AgCl_{(s)} + K^{+}_{(aq)} + NO_3^{-}{}_{(aq)}$

4. Given the following information:
   - cadmium metal strip, copper metal strip, cadmium nitrate solution, copper (II) nitrate solution
   - Cu^{2+} ions have a greater tendency to be reduced than Cd^{2+} ions.

   a. Draw and label an electrochemical cell (salt bridge design), include the appropriate half-reactions.
   b. Write a balanced overall equation for the reaction.
   c. If 4.13 g of $Cu_{(s)}$ forms, how many grams of $Cd_{(s)}$ must dissolve?