6. Answer the following questions about electrochemical cells.
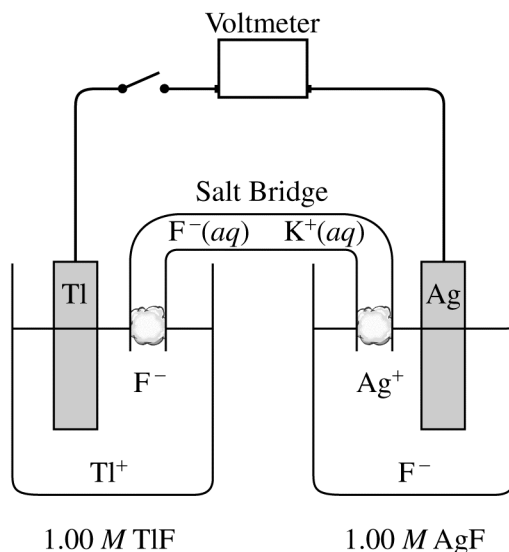
It is observed that when silver metal is placed in aqueous thallium(I) fluoride, TlF, no reaction occurs. When the switch is closed in the cell represented above, the voltage reading is +1.14 V.

(a) Write the reduction half-reaction that occurs in the cell.

(b) Write the equation for the overall reaction that occurs in the cell.

(c) Identify the anode in the cell. Justify your answer.

(d) On the diagram above, use an arrow to clearly indicate the direction of electron flow as the cell operates.

(e) Calculate the value of the standard reduction potential for the Tl^+/Tl half-reaction.

The standard reduction potential, $E°$, of the reaction $Pt^{2+} + 2\,e^- \rightarrow Pt$ is 1.20 V.

(f) Assume that electrodes of pure Pt, Ag, and Ni are available as well as 1.00 M solutions of their salts. Three different electrochemical cells can be constructed using these materials. Identify the two metals that when used to make an electrochemical cell would produce the cell with the largest voltage. Explain how you arrived at your answer.

(g) Predict whether Pt metal will react when it is placed in 1.00 M $AgNO_3(aq)$. Justify your answer.

STOP

END OF EXAM