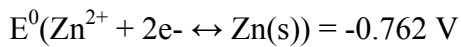


Quiz 7
Chem 311
Fall 2003

Name:

An indicator cell is constructed to measure $[Zn^{2+}]$. The zinc electrode is connected to the positive terminal on the voltmeter, the Ag/AgCl reference electrode is connected to the negative terminal. When measuring a solution of unknown $[Zn^{2+}]$, a reading of -1.039 V is obtained on the voltmeter. Assuming negligible junction potentials, calculate the $[Zn^{2+}]$ for this solution.



$$E(\text{Ag/AgCl/sat. KCl}) = 0.197 \text{ V}$$

$$\begin{aligned} E &= \{-0.762 - 0.05916/2 \log(1/[Zn^{2+}])\} - 0.197 \\ -1.039 &= -0.959 - 0.05916/2 \log(1/[Zn^{2+}]) \\ (-0.080) \cdot 2/0.05916 &= -\log(1/[Zn^{2+}]) \\ -2.70453 &= \log[Zn^{2+}] \end{aligned}$$

$$[Zn^{2+}] = 0.002 \text{ M}$$