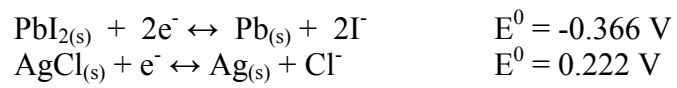
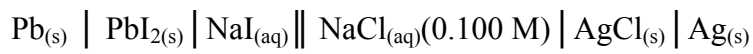


Chem 311
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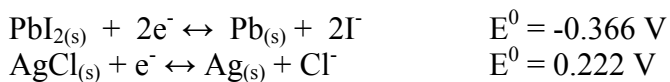
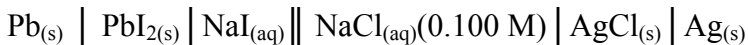
The following cell was constructed and produced a cell voltage of 0.588 V. Calculate the concentration of the NaI(aq).



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Name:

The following cell was constructed and produced a cell voltage of 0.588 V. Calculate the concentration of the NaI(aq).



$$E = E_+ - E_- = 0.588 \text{ V}$$

$$E_+ = E^0_+ - 0.05916 \log [\text{Cl}^-] = 0.222 - 0.05916 \log(0.100) = 0.281 \text{ V}$$

$$E_- = E^0_- - 0.05916/2 \log [\text{I}^-]^2 = -0.366 - 0.05916/2 \log([\text{I}^-])^2$$

$$0.588 = 0.281 - \{-0.366 - 0.05916/2 \log([\text{I}^-])^2\}$$

$$10^{\{2 \cdot (0.588 - 0.281 - (-0.366)) / 0.05916\}} = [\text{I}^-]^2 = 0.0100$$

$$[\text{I}^-] = 0.100 \text{ M}$$

Or

$$\begin{aligned} E &= (E^0_+ - E^0_-) - 0.05916/2 \log [\text{I}^-]^2 / [\text{Cl}^-]^2 \\ 0.588 &= (0.222 - (-0.366)) - 0.05916/2 \log [\text{I}^-]^2 / [0.100]^2 \\ 0.000 &= 0.05916/2 \log [\text{I}^-]^2 / [0.100]^2 \\ 0.000 &= \log [\text{I}^-]^2 / [0.100]^2 \\ \text{Therefore, } [\text{I}^-] &= [\text{Cl}^-] = 0.100 \text{ M} \end{aligned}$$