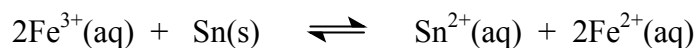
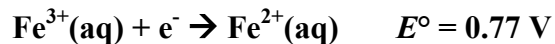


Marks
2

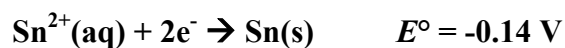
- What is the value of the equilibrium constant for the following reaction at 298 K?



The half cell reduction reactions and standard potentials are:



and



The $\text{Sn}^{2+} / \text{Sn}(\text{s})$ is operating in reverse so:

$$E_{\text{cell}}^{\circ} = ((0.77) - (-0.14) \text{ V}) = 0.91 \text{ V}$$

Using $E_{\text{cell}}^{\circ} = \frac{RT}{nF} \ln K$, the equilibrium constant for this 2e^{-} process is:

$$\ln K = \frac{(2) \times (96485 \text{ C mol}^{-1})}{(8.314 \text{ J K}^{-1} \text{ mol}^{-1}) \times (298 \text{ K})} \times (0.91) = 70.9$$

$$K = e^{70.9} = 6.05 \times 10^{30}$$

Answer: 6.05×10^{30}