	Marks
• What is the value of the equilibrium constant for the following reaction at 298 K? $2Fe^{3+}(aq) + 3Sn(s) \rightarrow 2Fe(s) + 3Sn^{2+}(aq)$ Relevant electrode potentials can be found on the data page.	**3**

The relevant reduction potentials are:

$Fe^{3+}(aq) + 3e^- \rightarrow Fe(s)$ $\quad E° = -0.04$ V

$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s)$ $\quad E° = -0.14$ V

As the Sn^{2+} / Sn couple is the more negative, it is reversed giving:

$E° = (-0.04 + 0.14)$ V $= 0.10$ V

The equilibrium constant, K, is related to the standard reduction potential using:

$E° = (RT/nF) \times \ln K$

$\ln K = nFE°/RT = (6 \times 96485 \times 0.10) / (8.314 \times 298) = 23.37$

$K = e^{23.37} = 1.4 \times 10^{10}$

Answer: **1.4×10^{10}**