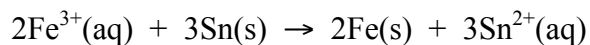


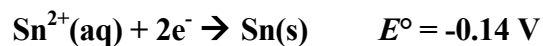
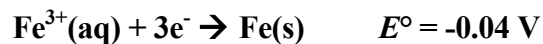
- What is the value of the equilibrium constant for the following reaction at 298 K?



Relevant electrode potentials can be found on the data page.

**Marks**  
**3**

**The relevant reduction potentials are:**



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

$$E^{\circ} = (-0.04 + 0.14) \text{ V} = 0.10 \text{ V}$$

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

$$E^{\circ} = (RT/nF) \times \ln K$$

$$\ln K = nFE^{\circ} / RT = (6 \times 96485 \times 0.10) / (8.314 \times 298) = 23.37$$

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

Answer:  $1.4 \times 10^{10}$