Exercise 6.3
Entropy Calculations

1. Calculate the standard entropy change for the dissociation of liquid water into $H^+_{(aq)}$ and $OH^-_{(aq)}$. Is this process favoured by entropy? How do you know?

2. Calculate the standard entropy change for the formation of chlorine molecules from chlorine atoms in the gas phase. Is this process favoured by entropy? How do you know?

$$S°\left(H^+_{(aq)}\right) = 0 \ \frac{J}{mol \cdot K}$$

$$S°\left(OH^-_{(aq)}\right) = -10.75 \ \frac{J}{mol \cdot K}$$

$$S°\left(H_2O_{(l)}\right) = 69.91 \ \frac{J}{mol \cdot K}$$

$$S°\left(Cl_{(g)}\right) = 165.2 \ \frac{J}{mol \cdot K}$$

$$S°\left(Cl_{2(g)}\right) = 223.1 \ \frac{J}{mol \cdot K}$$