

Challenge 7: T effect on K

On p 495 of Mahaffy et al., values of K_w are given for different temperatures.

Use the values at 15 °C and 25 °C to determine the values of $\Delta_r H^\circ$ and $\Delta_r S^\circ$ for the autoionization of water.

Answer: $\Delta_r H^\circ = 57.7 \text{ kJ/mol}$ and $\Delta_r S^\circ = -74.3 \text{ J/(K mol)}$

Use your results to calculate K_w at 35 °C.

Answer: 2.15×10^{-14}