2025 Ch H1 Q15

Section: Chemistry in Society

Topic: Chemical Energy

Question summary

The activation energies of the forward and reverse reactions are 165 kJ mol^-1 and 179 kJ mol^-1 respectively. What is the enthalpy change (∆H) for the forward reaction?

Worked solution

The enthalpy change (∆H) equals the difference between the activation energies of the forward and reverse reactions.

∆H = Ea(forward) - Ea(reverse).

∆H = 165 - 179 = -14 kJ mol^-1.

The negative sign indicates the forward reaction is exothermic.

Final answer

A. -14 kJ mol^-1

Revision tips

- Exothermic reactions: Ea(reverse) > Ea(forward), ∆H is negative.

- Endothermic reactions: Ea(forward) > Ea(reverse), ∆H is positive.

- Always include the sign when quoting ∆H; it shows whether energy is released or absorbed.