

Catalyst Effects on Equilibrium

<https://gemini.google.com/app/f7f338e0659fbe32>

Response: **Statement 1 Evaluation**

- **Statement:** "When a catalyst is added, the position of equilibrium of a reversible reaction changes."
- **Truth Value: False**
- **Reasoning:** A catalyst speeds up both the forward and reverse reactions equally by lowering the activation energy barrier for both pathways by the exact same amount. Because both rates increase proportionally, a catalyst helps the system reach equilibrium faster, but it does **not** alter the final position of equilibrium or the equilibrium constant (K_c).

Statement 2 Evaluation

- **Statement:** "A catalyst always increases the rate of the forward reaction more than the rate of the reverse reaction."
- **Truth Value: False**
- **Reasoning:** As noted above, a catalyst lowers the activation energy (E_a) for both the forward and reverse reactions by the exact same value (ΔE_a). Consequently, the rate constants for both the forward (k_f) and backward (k_r) reactions are increased by the exact same factor, maintaining equal rates at equilibrium.

Summary for MCQs (Two-Statement / Assertion-Reason Type)

- **Statement 1:** False
 - **Statement 2:** False
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