

Solutions

Each answer shows the steps, then the **result**.

2.1

- The reaction is thermodynamically favorable (spontaneous)

2.2

- The activation energy (kinetics)

2.3

- Yes

3.1 B

- a high activation energy (kinetics)

3.2

(a)

- Yes ($\Delta G < 0$)

(b)

- The activation energy is extremely high, so almost no molecules can cross the barrier and the rate is effectively zero

3.3

- A catalyst lowers the activation energy, providing a faster pathway; it does **not** change ΔG (the favorability)