Competing Thermodynamic, Kinetic, and Equilibrium Models

g12_u08_w30

Interpret original fictional model cards. No laboratory operation, chemical handling, device testing, intervention, or real-world decision is requested.

Cards. Card E labels a lower final energy state. Card K labels a high barrier and a slow stated rate. Card Q labels a reversible system with equal forward and reverse rates under stated conditions.

1. What question does a thermodynamic model address?

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2. What question does a kinetic model address?

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3. What question does an equilibrium model address?

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4. Does a lower final-energy label tell the rate? Explain.

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5. Does a slow rate label tell the final energy difference? Explain.

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6. What does an activation barrier represent in a simplified model?

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7. Why does barrier crossing require an energy distinction from overall energy change?

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8. What does reversible mean in Card Q?

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9. What does equal forward and reverse rate mean?

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10. Does equal rate mean equal amounts? Explain.

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11. Which card is most relevant to a question about speed?

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12. Which card is most relevant to a question about relative state energy?

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13. Which card is most relevant to a question about ongoing opposing changes?

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14. Name one condition that must remain labeled in a rate comparison.

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15. Name one condition that can shift an equilibrium model.

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16. Why is a catalyst model not evidence of a changed equilibrium position?

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17. Write a claim that Card E supports.

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18. Write a claim that Card E does not support.

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19. Explain why all three cards can describe the same fictional system without contradicting one another.

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20. Write a two-sentence bounded synthesis using Cards E, K, and Q.
