Dynamic Equilibrium

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

A reversible reaction can proceed in both directions. In a closed system at equilibrium, the forward and reverse reaction rates are equal.

1 Which statement describes dynamic equilibrium?

(1) Both reactions stop.

(2) Only the forward reaction continues.

(3) Both reactions continue at equal rates.

(4) Product and reactant amounts must be equal.

2 A sealed model has more product particles than reactant particles at equilibrium. Explain whether this is possible. [1]

Answer and work

3 When the forward reaction rate is greater than the reverse rate, what happens to the product amount in a model with one reactant and one product?

(1) It increases.

(2) It decreases.

(3) It remains constant.

(4) It must immediately become equal to the reactant amount.

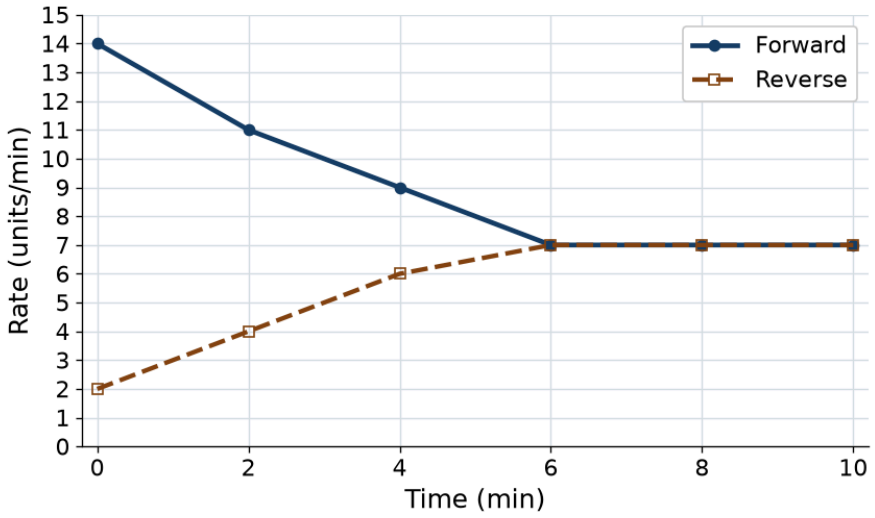
4 Explain why a closed container helps a team study equilibrium in a reaction that forms a gas. [1]

Answer and work

Rates in a Closed Model

Use the information below to answer the questions.

A simulation records the forward and reverse rates of the reversible change X ⇌ Y. X turns into Y in the forward direction. The graph uses the same rate units for both directions.



Forward and reverse rates in the model.

5 At what marked time do the two rates first become equal and remain equal in the graph?

(1) 2 min

(2) 4 min

(3) 6 min

(4) 10 min

6 At 4 minutes, what is the difference between the rates? Include units. [1]

Answer and work

7 At 8 minutes, have the two reactions stopped? Use the graph to explain. [1]

Answer and work

8 At 2 minutes, what is happening to the amount of Y?

(1) It is decreasing because the forward rate is higher.

(2) It is increasing because the forward rate is higher.

(3) It is constant because both reactions occur.

(4) It is constant because the reverse rate is zero.