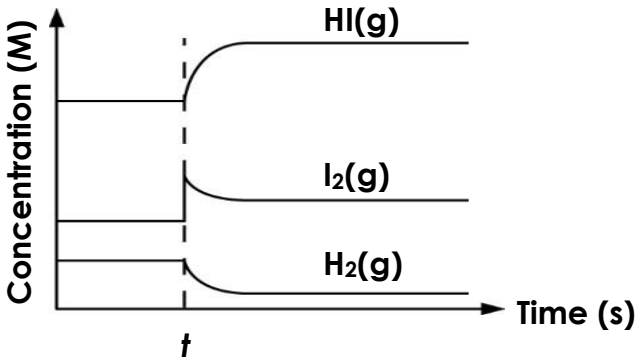
Quiz (Factors affecting Chemical Equilibrium)

1. Consider the following equilibrium:

   $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ $\Delta H < 0$

   The concentration change of each gas in the above equilibrium is shown as follows:

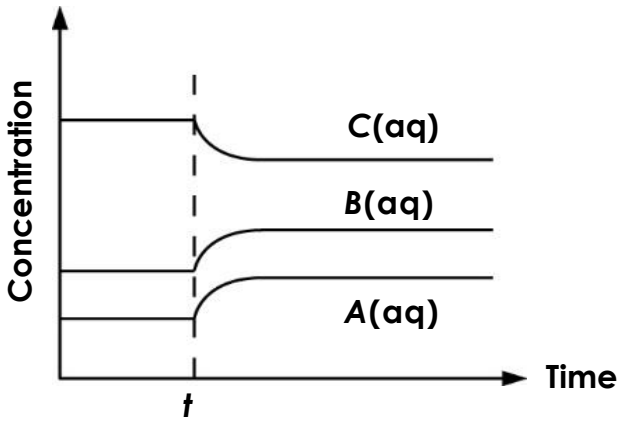


   What has been done on the equilibrium at time *t*?

   A. Increasing the reaction temperature
   B. Introducing more HI(g) to the mixture
   C. Introducing more $I_2(g)$ to the mixture
   D. Removing HI(g) from the mixture

2. The following graph shows the change in concentrations of the reactant and products with time for the reversible reaction:

   $C(aq) \rightleftharpoons A(aq) + B(aq)$ ΔH = +ve



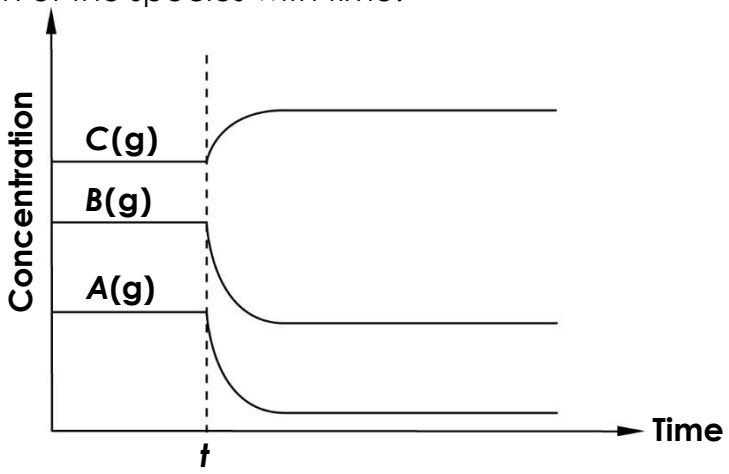
   Which of the following changes is done to the system at time *t*?

   A. Adding a small amount of *C*(aq)
   B. Removing a small amount *C*(aq)
   C. Increasing the temperature
   D. Decreasing the temperature

3. Consider the following equilibrium:

$$2A(g) + 2B(g) \rightleftharpoons C(g)$$

The system is disturbed at time *t*. The following graph shows the change in concentration of the species with time.



Which of the following statements is/are correct?

(1) The equilibrium position has shifted to the right.
(2) *C*(g) is added to the equilibrium mixture at time *t*.
(3) The pressure of the equilibrium increases suddenly at time *t*.

A. (1) only
B. (2) only
C. (1) and (3) only
D. (2) and (3) only

Suggested Answer

1. C
   There is a sudden increase in concentration of $I_2(g)$ at time *t*. This suggests that $I_2(g)$ is introduced to the mixture at time *t*.

2. C
   As the forward reaction is endothermic, an increase in temperature shifts the equilibrium position to the right. More *A*(aq) and *B*(aq) will be produced but less *C*(aq) will be remained.

3. A
   If *C*(g) were added to the equilibrium mixture, the concentration of *C* would have increased sharply at time *t*. If the pressure were increased suddenly, the concentrations of *A*, *B* and *C* would have increased sharply at time *t*.