

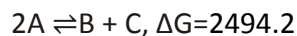


7. The standard Gibbs energy change at 300 K for the reaction $2A \rightleftharpoons B + C$ is 2494.2 J. At a given time, the Composition of the reaction mixture is $[A] = \frac{1}{2}$, $[B] = 2$ and $[C] = \frac{1}{2}$. The reaction proceeds in the :[R=8.314 J/K/mol, e=2.718]

- (1) forward direction because $Q > K_c$
(3) forward direction because $Q < K_c$

- (2) reverse direction because $Q > K_c$
(4) reverse direction because $Q < K_c$

Answer:



$$\Delta G = \Delta G^0 + RT \ln Q$$

$$\text{or } 0 = 2494.2 + 8.314 \times 300 \ln K_c$$

$$\text{or } -1 = \ln K_c$$

$$\text{or } K_c = \frac{1}{2.7}$$

Now $2A \rightleftharpoons B + C$

$$Q = \frac{[B][C]}{[A]^2} = \frac{2 \times \frac{1}{2}}{\left(\frac{1}{2}\right)^2} = 4$$

Here $Q > K_c$ this implies reaction shifted in reverse direction.

Correct option is (2) reverse direction because $Q > K_c$