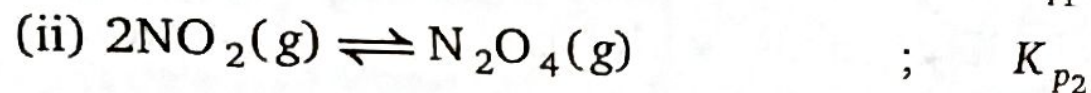
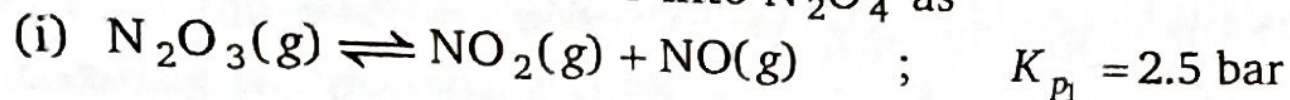




Passage 3

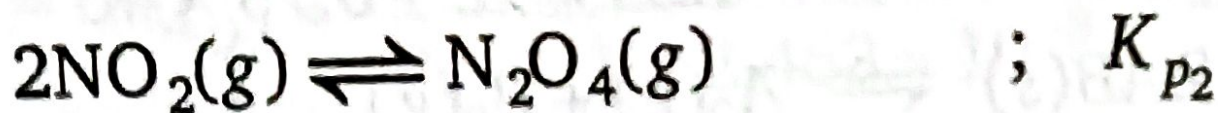
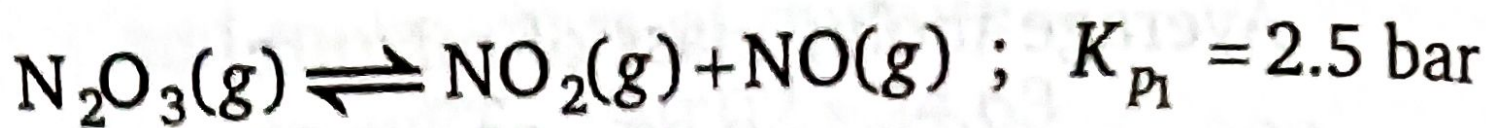
N_2O_3 is an unstable oxide of nitrogen and it decomposes into $\text{NO}(g)$ and $\text{NO}_2(g)$ where $\text{NO}_2(g)$ is further dimerise into N_2O_4 as



A flask is initially filled with pure $\text{N}_2\text{O}_3(g)$ having pressure 2 bar and equilibria was established.

At equilibrium partial pressure of $\text{NO}(g)$ was found to be 1.5 bar.

- The equilibrium partial pressure of $\text{N}_2\text{O}_3(g)$ is:
(a) 0.5 bar ✓ (b) 1.0 bar (c) 1.5 bar (d) 0.1 bar
- The equilibrium partial pressure of $\text{NO}_2(g)$ is:
(a) 0.066 bar (b) 0.133 bar ✓ (c) 0.423 bar ~~(d) 0.83 bar~~
- The value of K_{p_2} is:
(a) 0.16 bar^{-1} (b) 0.32 bar^{-1} ✓ ~~(c) 0.48 bar^{-1}~~ (d) 0.64 bar^{-1} ✓



$$x - y \quad y/2$$

$$P_{\text{NO}} = x = 1.5 \text{ b}$$

$$\therefore K_{P_1} = \frac{P_{\text{NO}} \cdot P_{\text{NO}_2}}{P_{\text{N}_2\text{O}_3}}$$

$$2.5 = \frac{x(x-y)}{2-x} = \frac{1.5(1.5-y)}{2-1.5} = 4.5 - 3y$$

$$\Rightarrow y = \frac{2}{3} \text{ bar}$$

$$(1) P_{\text{N}_2\text{O}_3} = 2 - x = 2 - 0.5 = 0.5 \text{ b}$$

$$(2) P_{\text{NO}_2} = x - y = 1.5 - \frac{2}{3} = \frac{2.5}{3} \text{ b}$$

$$(3) K_{P_2} = \frac{y}{2(x-y)^2} = \frac{2/3}{2\left(\frac{2.5}{3}\right)^2} = 0.48 \text{ bar}^{-1}$$