Question:

In a closed system A(s)= 2B(g)+3C(g) if the partial pressure of C is doubled then partial pressure of B will be?

Answer:

For the closed system :

$$A(s) \rightleftharpoons 2B\,(g) + 3C(g)$$

$$Kp = (p_B)^2 \times (p_C)^3$$

$$\Rightarrow \frac{K_p}{(p_C)^3} = \left(p_B\right)^2 \quad \dots\dots\dots\dots \text{ equation 1}$$

since Kp is constant thus if we double the partial pressure of C then $p'_C = 2p_C$

$$Kp = (p'_B)^2 \times (p'_C)^3$$

$$Kp = (p'_B)^2 \times (2p_C)^3$$

$$\frac{K_p}{(2p_C)^3} = \left(p'_B\right)^2$$

$$\frac{K_p}{8\,(p_C)^3} = \left(p'_B\right)^2$$

From equation 1

$$\frac{1}{8} \left(p_B\right)^2 = \left(p'_B\right)^2$$

$$p'_B = \frac{1}{2\sqrt{2}} \; p_B$$

Thus pressure of B component will reduce by a factor of $2\sqrt{2}$.

https://www.AssignmentExpert.com