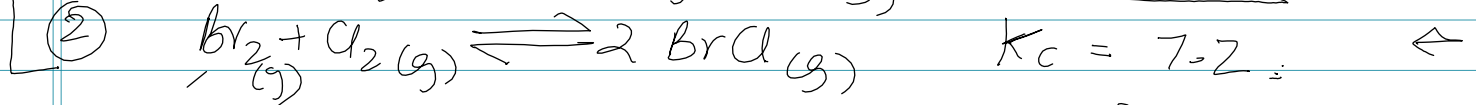
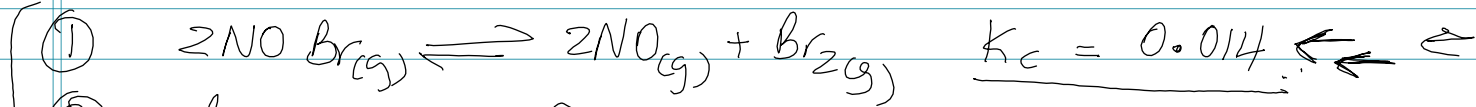


Sapna Saha

Eq (2) Manipulating K_c .

* The following reactions have the eq. constants given below. Calculate the K_c for the equations that follow.



$$* K_{c1} = \frac{[\text{NOBr}]^2}{[\text{NO}]^2 [\text{Br}_2]} \quad \longleftrightarrow \quad K_{c2} = \frac{[\text{BrCl}]^2}{[\text{Br}_2] [\text{Cl}_2]}$$

| Equation | K_c | Ans. |
|---|---|--|
| (a) $2\text{NO} + \text{Br}_2 \rightleftharpoons 2\text{NOBr}$ | $* \frac{[\text{NOBr}]^2}{[\text{NO}]^2 [\text{Br}_2]}$ | opp. of eqn (1); inverse. inv. of K_c $1/0.014 = \boxed{171}$ |
| (b) $4\text{NOBr} \rightleftharpoons 4\text{NO} + 2\text{Br}_2$ | $* \frac{[\text{NO}]^4 [\text{Br}_2]^2}{[\text{NOBr}]^4}$ | double of eq (1) $K_c = \text{squared.}$ $(0.014)^2 = \boxed{2.0 \times 10^{-4}}$ |
| (c) $\text{NOBr} \rightleftharpoons \text{NO} + \frac{1}{2}\text{Br}_2$ | $* \frac{[\text{NO}] [\text{Br}_2]^{1/2}}{[\text{NOBr}]}$ | half of eq (1) K_c is square rooted. $\sqrt{0.014} = \boxed{0.12}$ ($K_c^{1/2}$) |
| (d) $2\text{NOBr} + \text{Cl}_2 \rightleftharpoons 2\text{NO} + 2\text{BrCl}$ | $\frac{[\text{BrCl}]^2 [\text{NO}]^2}{[\text{NOBr}]^2 [\text{Cl}_2]}$ | added eq (1) and (2). $K_{c1} \times K_{c2}$ $0.014 \times 7.2 = \boxed{0.10}$ |
| (e) $\text{NO} + \text{BrCl} \rightleftharpoons \text{NOBr} + \frac{1}{2}\text{Cl}_2$ | $\frac{[\text{NOBr}] [\text{Cl}_2]^{1/2}}{[\text{NO}] [\text{BrCl}]}$ | look at (d) inv. of (d) and $\frac{1}{2}$ of (c) $\frac{1}{0.10} \times \frac{1}{\sqrt{0.014}} = \boxed{3.2}$ [eq (d) is reversed and $\frac{1}{2}$ eq (c) is reversed & $\frac{1}{2}$] |