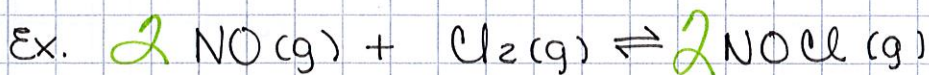


Calculating the Equilibrium Constant, K_{eq}

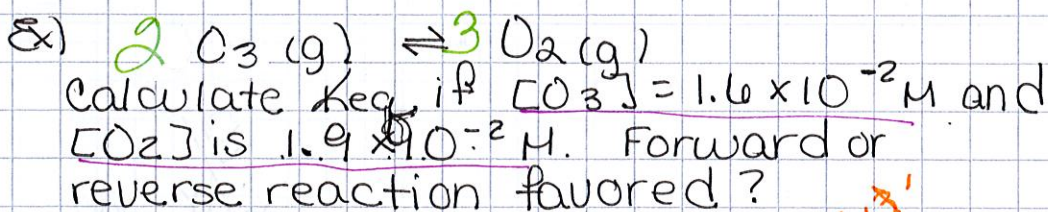
IF K_{eq} is...	reaction is favored.
$= 1$	neither
< 1	reverse
> 1	forward



Calculate K_{eq} if $[\text{NO}] = .0250 \text{M}$,
 $[\text{Cl}_2] = .0200 \text{M}$, & $[\text{NOCl}] = .500 \text{M}$.
Is the forward or reverse reaction favored?

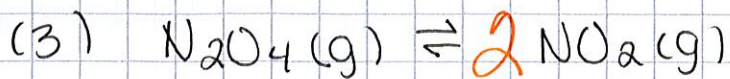
$$K_{eq} = \frac{[\text{NOCl}]^2}{[\text{NO}]^2 \cdot [\text{Cl}_2]} = \frac{[.500 \text{M}]^2 \text{M}^2}{[.0250 \text{M}]^2 \cdot [.0200 \text{M}] \text{M}^2} = 20000 \frac{1}{\text{M}}$$

forward is favored



$$K_{eq} = \frac{[\text{O}_2]^3}{[\text{O}_3]^2} = \frac{[1.9 \times 10^{-2} \text{M}]^3 \text{M}^3}{[1.6 \times 10^{-2} \text{M}]^2 \text{M}^2} = .027 \text{M}$$

reverse is favored.



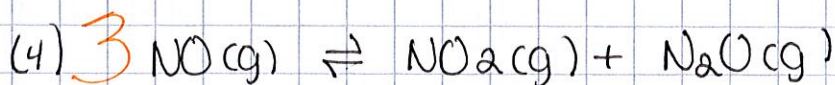
K_{eq} is .212M; $[NO_2] = .0875M$.
Calculate the $[N_2O_4]$?
Which reaction is favored?

$$K_{eq} = \frac{[NO_2]^2}{[N_2O_4]}$$

$$[N_2O_4] \cdot .212M = \frac{[.0875M]^2}{[N_2O_4]}$$

$$\frac{[N_2O_4] \cdot .212M}{.212M} = \frac{[.0875M]^2}{.212M} \quad \frac{M \cdot M}{M}$$

$$[N_2O_4] = .0361M \quad \text{reverse is favored!}$$



5.50 mol NO, 3.30 mol NO₂, &
2.20 mol N₂O are all dissolved
in .300L of solution. Calculate
 K_{eq} which reaction is
favored?

$$M = \frac{n}{V}$$

$$K_{eq} = \frac{[NO_2] \cdot [N_2O]}{[NO]^3} \quad [NO] = \frac{5.50 \text{ mol}}{.300L} = 18.3M$$

$$[NO_2] = \frac{3.30 \text{ mol}}{.300L} = 11.0M$$

$$[N_2O] = \frac{2.20 \text{ mol}}{.300L} = 7.33M$$

$$K_{eq} = \frac{[11.0M][7.33M]}{[18.3M]^3}$$

$$K_{eq} = .0132 \frac{1}{M}$$

$$\frac{M \cdot M}{M \cdot M \cdot M}$$

reverse is favored