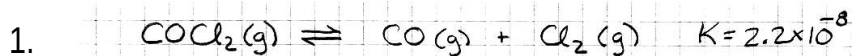


PRACTICE: EQUILIBRIUM CALCULATIONS 4

SOLUTIONS



I	1.5	0	0
C	-x	+x	+x
E	1.5-x	x	x

$$K = \frac{[\text{CO}][\text{Cl}_2]}{[\text{COCl}_2]}$$

$$2.2 \times 10^{-8} = \frac{(x)(x)}{1.5-x}$$

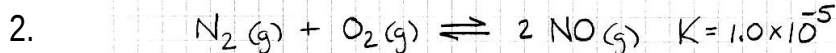
$$2.2 \times 10^{-8} \approx \frac{x^2}{1.5} \quad (\text{assume } 1.5-x = 1.5)$$

$$x = \sqrt{1.5(2.2 \times 10^{-8})}$$

$$= 1.81659 \dots \times 10^{-4}$$

$$[\text{Cl}_2]_{\text{eq}} = x \text{ mol/L}$$

$$= 1.8 \times 10^{-4} \text{ mol/L}$$



I	0.104	0.028	0
C	-x	-x	+2x
E	0.104-x	0.028-x	2x

$$K = \frac{[\text{NO}]^2}{[\text{N}_2][\text{O}_2]}$$

$$1.0 \times 10^{-5} = \frac{(2x)^2}{(0.104-x)(0.028-x)}$$

$$1.0 \times 10^{-5} = \frac{4x^2}{(0.104)(0.028)} \quad \left\{ \begin{array}{l} \text{assume} \\ 0.104-x = 0.104 \\ 0.028-x = 0.028 \end{array} \right.$$

$$x = \sqrt{\frac{1.0 \times 10^{-5}(0.104)(0.028)}{4}}$$

$$= 8.53229 \dots \times 10^{-5}$$

$$[\text{NO}]_{\text{eq}} = 2x \text{ mol/L}$$

$$= 2(8.53229 \dots \times 10^{-5}) \frac{\text{mol}}{\text{L}}$$

$$= 1.7 \times 10^{-4} \frac{\text{mol}}{\text{L}}$$