

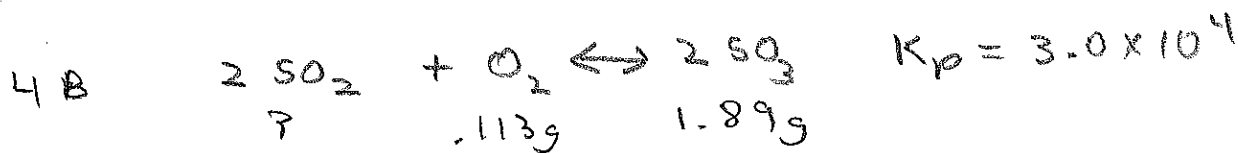


$$[\text{I}] = \frac{2.81 \times 10^{-2} \text{ g I} / 126.9 \text{ g I}}{10.0 \text{ L}} = 2.214 \times 10^{-4}$$

$$K_c = \frac{[\text{I}]^2}{[\text{I}_2]} \quad 3.1 \times 10^{-5} = \frac{[2.214 \times 10^{-4} \text{ M}]^2}{[\text{I}_2]}$$

$$[\text{I}_2] = 1.58 \times 10^{-5}$$

$$\frac{1.58 \times 10^{-5} \text{ mol} / 10.0 \text{ L}}{1 \text{ mol I}_2} = \boxed{.0401 \text{ g I}_2}$$



Use $PV = nRT \quad P = \frac{g RT}{MM \cdot V}$

$$P_{\text{SO}_3} = \frac{1.89 \text{ g} \left(.0821 \frac{\text{atm} \cdot \text{L}}{\text{mol} \cdot \text{K}} \right) (700 \text{ K})}{(80.06 \text{ g/mol}) (2.00 \text{ L})} = .678 \text{ atm.}$$

$$P_{\text{O}_2} = \frac{.113 \text{ g} \left(.0821 \frac{\text{atm} \cdot \text{L}}{\text{mol} \cdot \text{K}} \right) (700 \text{ K})}{(32 \text{ g/mol}) (2.00 \text{ L})} = .101 \text{ atm}$$

$$K_p = 3.0 \times 10^4 = \frac{P_{\text{SO}_3}^2}{P_{\text{SO}_2}^2 \cdot P_{\text{O}_2}}$$

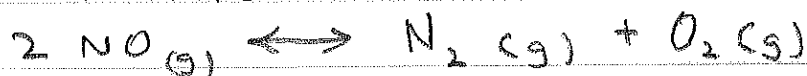
$$P_{\text{SO}_2}^2 = \frac{(.678)^2}{(3.0 \times 10^4) (.101)} = \sqrt{1.55 \times 10^{-6}} = .0012 \text{ atm.}$$

Rearranging the ideal Gas Law:

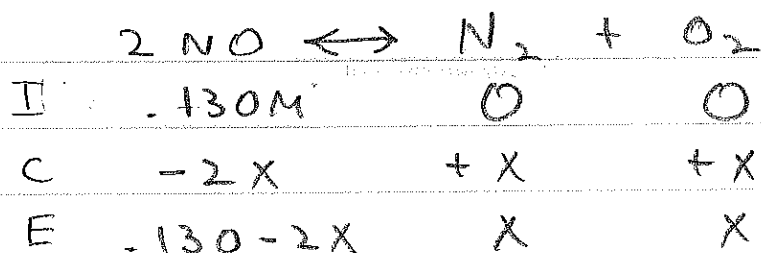
$$g \text{SO}_2 = \frac{MM \cdot V \cdot P}{RT} = \frac{(64.06 \text{ g/mol}) (2.00 \text{ L}) (.0012 \text{ atm})}{\left(.0821 \frac{\text{atm} \cdot \text{L}}{\text{mol} \cdot \text{K}} \right) (700 \text{ K})}$$

$$g \text{SO}_2 = \boxed{.0027 \text{ g}}$$

15.6 On-line



#5 $K_c = \frac{[\text{N}_2][\text{O}_2]}{[\text{NO}]^2} \quad K_c = 2.4 \times 10^3$



$$2.4 \times 10^3 = \frac{X^2}{(.130 - 2X)^2}$$

$$X^2 = (2.4 \times 10^3)(.130 - 2X)^2$$

Take Square
Root of both
sides

$$X = (49)(.130 - 2X)$$

$$X = 6.37 - 98X$$

$$99X = 6.37$$

$$X = .0643$$

$$[\text{O}_2] = X = \boxed{.0643 \text{ M}}$$

$$[\text{N}_2] = X = \boxed{.0643 \text{ M}}$$

$$[\text{NO}] = .130 - 2(.0643) = \boxed{.0014 \text{ M}}$$

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