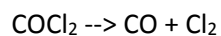


Answer on Question 37834 - Chemistry - Physical Chemistry

Question:

Given the equation:



- A reaction mixture initially contains 1.6 M COCl_2 . Draw an "ICE" box that gives the concentrations of all reactants and products of equilibrium in terms of x .
- K_c for the reaction at this temperature is 8.33×10^{-4} . Determine the equilibrium concentrations of all reactants and products using your equilibrium constant expression and ICE box results. You may make the assumption that the answer is negligible compared to 1.6

Answer:

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

Denote the concentration of products $[\text{CO}] = [\text{Cl}_2] = x$. Hence $[\text{COCl}_2] = 1.6 - x \approx 1.6$ ($x \ll 1.6$)

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

$$8.33 \cdot 10^{-4} \cdot 1.6 = x^2$$

$$x = 0.037 \text{ M}$$

So, the equilibrium concentrations $[\text{CO}] = [\text{Cl}_2] = 0.037 \text{ M}$