

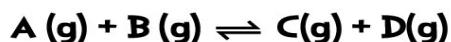
Name:

Date:

CHEMICAL EQUILIBRIUM REACTIONS

Calculate the equilibrium constant, K_c , for the following reactions.
Use the given concentrations of reactants and products at equilibrium.

For the reaction:



At equilibrium, the concentrations are:

$$[A] = 0.25 \text{ M}, \quad [B] = 0.40 \text{ M}, \quad [C] = 0.15 \text{ M}, \quad [D] = 0.30 \text{ M}$$

Calculate K_c !

Solution:

The equilibrium constant expression is: $K_c = \frac{[C][D]}{[A][B]}$

Substitute the values:

$$K_c = \frac{(0.15)(0.30)}{(0.25)(0.40)} = \frac{0.045}{0.10} = 0.45$$

For the reaction:



At equilibrium, the concentrations are:

$$[PCl_5] = 0.10 \text{ M}, \quad [PCl_3] = 0.30 \text{ M}, \quad [Cl_2] = 0.20 \text{ M}$$

Calculate K_c !

Solution:

The equilibrium constant expression is: $K_c = \frac{[PCl_3][Cl_2]}{[PCl_5]}$

Substitute the values:

$$K_c = \frac{(0.30)(0.20)}{(0.10)} = \frac{0.06}{0.10} = 0.460$$