Lecture Notes J: Chemical Equilibrium II

Problem
Consider the following reaction:

\[ A + 2B \leftrightarrow 2C \quad K = 1.6 \times 10^{-4} \]

50.0 ml of a 0.150M solution of A is mixed with 25.0 ml of a 0.250M solution of B. At equilibrium, what is the concentration of each of the species ([A], [B], [C]) in the solution?
Concept
Consider the following reaction

\[ 2\text{NOCl}(g) \rightleftharpoons 2\text{NO}(g) + \text{Cl}_2(g) \]

with initial conditions: \[ [\text{NOCl}]_0 = 1.0 \text{ M} \]; \[ [\text{NO}]_0 = 0.5 \text{ M} \]; \[ [\text{Cl}_2]_0 = 0.0 \]

Which is the correct expression for the equilibrium concentrations?

A. \[ [\text{NOCl}] = 1.0-2x \quad [\text{NO}] = 0.5+2x \quad [\text{Cl}_2] = +2x \]
B. \[ [\text{NOCl}] = 2.0-2x \quad [\text{NO}] = 0.5+2x \quad [\text{Cl}_2] = +x \]
C. \[ [\text{NOCl}] = 1.0-2x \quad [\text{NO}] = 0.5+2x \quad [\text{Cl}_2] = +x \]
D. \[ [\text{NOCl}] = 1.0+x \quad [\text{NO}] = 0.5+x \quad [\text{Cl}_2] = -x \]

Problem
Consider the following reaction:

\[ \text{A} + 2 \text{B} \rightleftharpoons 2 \text{C} \quad K = 1.6 \times 10^4 \]

50.0 ml of a 0.150M solution of A is mixed with 25.0 ml of a 0.250M solution of B. At equilibrium, what is the concentration of each of the species ([A], [B], [C]) in the solution?