Evaluating K_c For A Chemical Reaction

Evaluate Kc for the reaction: $Hg^{2+}(aq) + Cl^{-}(aq) \leftrightarrow HgCl^{+}(aq)$ from the following data:
50.00 mL of 0.2000 M Hg^{2+} is mixed with 50.00 mL of 0.2000 M Cl^{-1}. When equilibrium is reached, the concentration of $HgCl^{+}$ is found to be 0.0364 M.

$K_c = \frac{[HgCl^+]}{[Hg^{2+}][Cl^-]}$ where all concentrations are the equilibrium molarity.

Construct a table of initial, change and equilibrium **moles** of each substance and then find the equilibrium molarity of each substance.

Initial moles of both Hg^{2+} and Cl^{-} are both 0.01000: (0.2000mol/L)(0.05000L)

Reactant/Product	Hg^{2+}	+	Cl^{-}	↔	$HgCl^{+}$
Initial moles	0.01000		0.01000		0.00000 (all given)
Change in moles	-0.00364		-0.00364		+0.00364
Equil. Moles	0.00636		0.00636		0.00364 *
Equil. Molarity **	0.0636		0.0636		0.0364 (given)

* moles = (0.0364mol/L)(0.1000L) Mixing 50.0 mL of each reactant gives 100.0 mL

** M equals equilibrium moles of species divided by the final volume of 100.0 mL.

Thus $K_c = \frac{0.0364M}{(0.0636M)(0.0636M)} = 9.00M^{-1}$