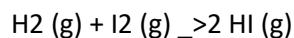


### Problem Set Equilibrium

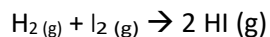
1. What happens to the equilibrium constant,  $K$ , if the original reaction is  $A + B \rightarrow C$  if the reaction is  $2A + 2B \rightarrow 2C$ .

2. When 2.00 mol each of hydrogen and iodine are mixed in a 1.00-L flask, 3.50 mol of HI is produced at equilibrium:



Calculate the equilibrium constant  $K_c$  for this reaction.

3. Given the following reaction,



Calculate all three equilibrium concentrations when the initial concentration of  $[\text{H}_2]_0 = [\text{I}_2]_0 = 0.200\text{ M}$  and  $K_c = 64.0$ .

4. An equilibrium mixture of  $\text{PCl}_5(\text{g})$ ,  $\text{PCl}_3(\text{g})$ , and  $\text{Cl}_2(\text{g})$  has partial pressures of 217.0 Torr, 13.2 Torr, and 13.2 Torr, respectively. A quantity of  $\text{Cl}_2(\text{g})$  is injected into the mixture, and the total pressure jumps to 263.0 Torr (at the moment of mixing). The system then re-equilibrates; what is pressure of each gas?, what are the new equilibrium pressures of each gas? The chemical equilibrium is  $\text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow \text{PCl}_5(\text{g})$