**Prediction the direction of a reaction and**

**Qc.**

**Consider the following again:**

**H2 (g) + I2(g) 2HI (g) Kc = 57 @ 700 K**

**Concentrations:**

**[H2]t = .1 M, [I2]t = .2 M and [HI]t = .4 M.**

**“t” : means that the concentrations were measured at some arbitrary time (t), not necessarily at equilibrium.**

**If we substitute these concentrations into the equilibrium expression, we obtain a value called the Reaction Quotient (Qc).**

**Qc: is defined the same way Kc is but, the concentrations in Qc are not necessarily equilibrium values.**

**Qc (from example) = [HI]2t / [H2]t[I2]t =**

**(.4)2 / (.1)(.2) = 8.0**

**Since the numerical value of Qc is 8.0 (from the given equation) does not equal it’s Kc of 57.0, this indicates that the mixture of H2, I2 and HI are not at equilibrium.**

**As time passes, the reaction will occur, changing concentrations and thus changing the values of Qc in the direction of Kc (towards equilibrium).**

**After a sufficient amount of time, an equilibrium state will be reached and Qc = Kc.**

**Qc can be used to predict the direction of reactions by comparing Qc values to Kc values.**

**If Qc < KC: net reaction goes from left to right.**

**If Qc > Kc: net reaction goes from right to left.**

**If Qc = Kc: No net reaction occurs.**