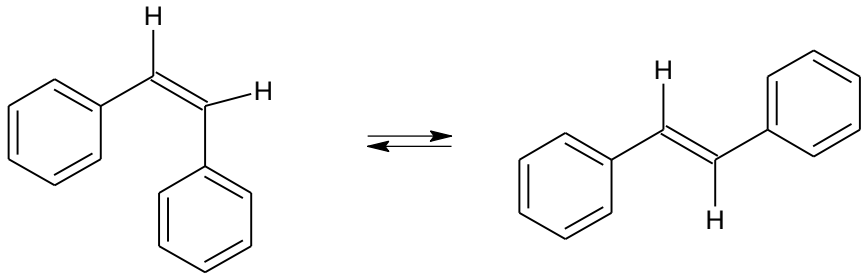
Mr. Bracken
AP Chemistry

Name _____
Period _____

Equilibrium Notes #3

Example 1:
Consider the following equilibrium process. What are the equilibrium concentrations of *cis*-stilbene and *trans*-stilbene if the initial concentration is 0.850 M *cis*-stilbene?



cis-stilbene ⇆ *trans*-stilbene **K = 24.0 at 200^{o}C**

RICE, RICE Baby!

Example 2:
Enough ammonia (NH_3) is dissolved in 5.00 Liters of water at 25°C to produce a solution that is 0.0124 M in ammonia. The solution is then allowed to come to equilibrium. Analysis of the equilibrium mixture shows that the concentration of the OH^{1-} is 4.64×10^{-4}M.

Calculate K at 25°C for this reaction.

$$NH_3\,(aq) + H_2O\,(l) \leftrightarrows NH_4^{1+}\,(aq) + OH^{1-}\,(aq)$$

Example 3:
A mixture of 0.500 moles of H_2 and 0.500 moles of I_2 was placed inside a 1.00-Liter stainless steel flask at 430°C where the following reaction occurs.

$$H_2\,(g) + I_2\,(g) \leftrightarrows 2\,HI\,(g)$$

The equilibrium constant for the reaction is 54.3 at this temperature. What are the concentrations of H_2, I_2, and HI at equilibrium?

Example 4:
At 2000^{o}C the equilibrium constant for the reaction shown below is K = 2.4 x 10^{3}. If the initial partial pressure of NO is 37.3 atm, what are the equilibrium partial pressures of NO, N_2, and O_2 ?

$$2\ NO\ (g) \leftrightarrows N_2\ (g) + O_2\ (g)$$

Example 5:
A mixture of 0.00623 M H_2 , 0.00414 M I_2 , and 0.0224 M HI was placed inside a 1.00-Liter stainless steel flask at 430^{o}C where the following reaction occurs.

$$H_2\ (g) + I_2\ (g) \leftrightarrows 2\ HI\ (g)$$

The equilibrium constant for the reaction is 54.3 at this temperature. What are the concentrations of H_2, I_2, and HI at equilibrium?