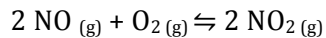


1. ICE Tables

ICE Tables

Example:

(1) A 2.0 L bulb contains 6.00 mol of NO₂ (g), 3.0 mol of NO (g) and 0.20 mol of O₂ at equilibrium. What is the K_{eq} for this reaction?

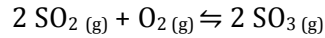


- Determine the K_{eq} expression:

- Calculate the concentration of each species:

- Substitute into the K_{eq} expression:

(2) 4.00 mol of SO₃ is introduced into a 2.00 L bulb. After 5 minutes, equilibrium is established and is found that 0.500 mol of O₂ (g) exists. What is the K_{eq} value?



- The system was at equilibrium – then a stress was introduced. What is this stress?
- The addition of product means that the equilibrium will shift _____ forming more _____ and decreasing concentration of the _____.

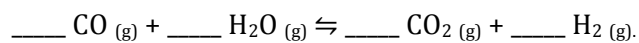


- **All changes in concentration must obey stoichiometric proportions.**

	SO ₂ (g)	+	O ₂ (g)	⇌	SO ₃ (g)
Original Equilibrium					
Initial (Where the stress is introduced)					
Change (How the system responds to the stress)					
Equilibrium (New equil'm concentrations)					

- K_{eq} is calculated using the new equilibrium concentrations:

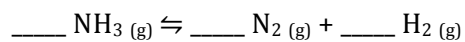
(3) A 1.00L reaction vessel contains 0.750 mol of CO and 0.275 mol of H₂O only. After 1 hour, equilibrium is reached according to:



Analysis shows 0.250 mol of CO₂ is present at equilibrium. What is the K_{eq}?

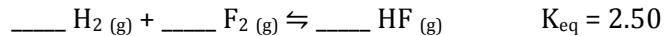
	CO _(g)	+	H ₂ O _(g)	⇌	CO ₂ _(g)	+	H ₂ _(g)
Original Equilibrium							
Initial							
Change							
Equilibrium							

(4) A student placed 7.00 mol NH₃ in a 0.500L flask. At equilibrium, 6.2 M N₂ was found in the flask. What is the equilibrium constant for this reaction?



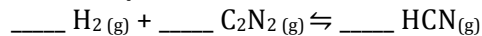
Determining Equilibrium Concentrations from K_{eq} and the Initial Concentrations

(1) The following gases are injected into a 1.00L flask: 1.20 mol of $H_2(g)$ and 1.20 mol of $F_2(g)$. What will the concentration of HF be when equilibrium is achieved?



	$H_2(g)$	+	$F_2(g)$	\rightleftharpoons	$HF(g)$
Initial					
Change					
Equilibrium					

(2) 4.00 mol H_2 and 4.00 mol C_2N_2 are injected into a 2.00 L flask where they establish equilibrium. What is the $[C_2N_2]$ when equilibrium is achieved? $K_{eq} = 5.00$



(3) A 3.00 L flask contains 6.00 M H₂, 6.00 M Cl₂ and 3.00 M HCl at equilibrium. An additional 15 mol of HCl is injected into the flask. What is the [Cl₂] when equilibrium is re-established?

What is K_{eq}?



	H ₂ (g)	+	Cl ₂ (g)	⇌	HCl (g)
<i>Original Equilibrium</i>					
Initial					
Change					
Equilibrium					

(4) The table below shows the molarity of three gases at equilibrium. The concentration of HF is then decreased as shown. What is the [HF] when equilibrium is re-established?

$K_{eq} =$

	H ₂ (g)	+	F ₂ (g)	⇌	HF (g)
<i>Original Equilibrium</i>	6.00		6.00		12.0
Initial	6.00		6.00		5.00
Change					
Equilibrium					

Hebden Workbook: Pg. 70 #47-49, 53, 55, 60