$2Mg + O_2 \rightarrow 2MgO$

Goes to completion

$$Fe_2O_3 + 2Al \rightarrow 2Fe + Al_2O_3$$

What is equalibrium?

$\rightleftharpoons$

When the rate of rxn is equal and the Consentrations of all the Species are constant.

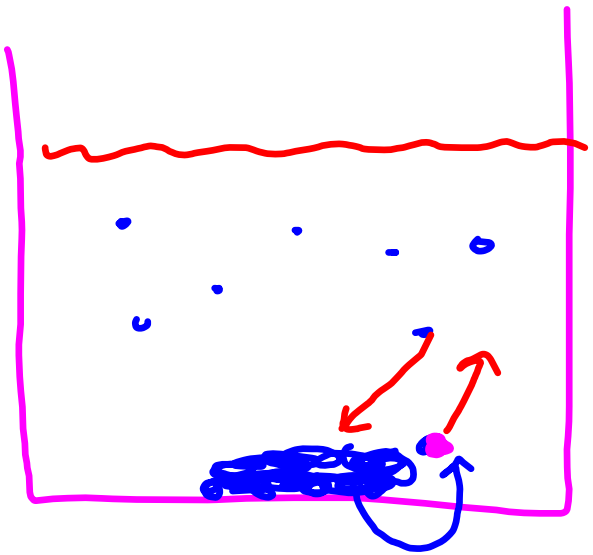
.1 M .06 M

[A] [B]

same rate

$A + B \rightleftharpoons C$ [C] 1.3M

$[A] \neq [B] \neq [C]$



The amount dissolved does not equal the amount undisolved

NO_x

$2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$

White brown

P LA rookies

1960s brown

1980s white

$$N_2 + 3H_2 \rightarrow 2NH_3$$

Haber process

4 mols → 2 mol

$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)} + \text{heat}$

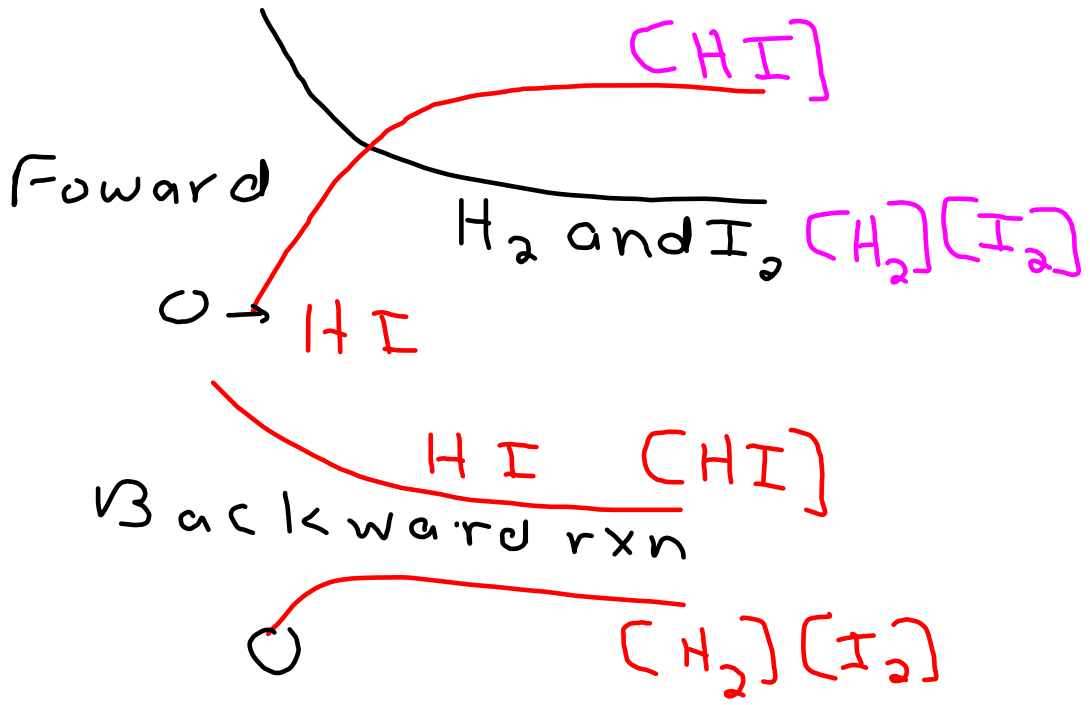
increase N_2 or H_2

decrease temp

increase press.

L'Chatlier's Principle

$$H_2 + I_2 \rightleftharpoons 2HI$$



Spike $[H_2]$ the system will move toward product

How to get to the web site to get the notes:

- Current Students
  - Academic Departments
    - Scroll down
      - Science, Enginnering and Architecture
        - Syllabi
          - Scroll down
          - CHM 106 General Chemistry II

.PDF

1 A reactants

B product

C reactants

E product

F cannot make NH_3
No rxn

G product

K = equilbrium constant at a certain temp

$$aA + bB \rightarrow cC + dD$$

$$K = \frac{\text{product}}{\text{reactants}}$$

$$K = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

K we want greater then 1

$$H_2 + I_2 \rightarrow 2\,HI$$

$$K = \frac{[HI]^2}{[I_2][H_2]}$$

$$K_P = \frac{P_{HI}^2}{P_{H_2} P_{I_2}}$$

$$CuSO_2 \cdot 5H_2O_{(s)} \rightleftharpoons CuSO_{4(s)} + 5H_2O_{(g)}$$

$$K = [H_2O]^5$$

The equilbrium constant expression does not include terms of pure solid and liquid phases b/c their conc. do not change in the rxn

$3H_2 + N_2 \rightarrow 2NH_3$

$K_c = 3.8 \times 10^4$ @ 127

$Q = \frac{\text{Products}}{\text{reactants}}$ at a certain point in time

$$\frac{(2.2 \times 10^{-1})^2}{(1.2 \times 10^{-4})^3 (3.3 \times 10^{-5})} =$$

8.48×10^{14}

$8.48 \times 10^{14} > 3.8 \times 10^4$

Q K

towards the reatants

$$3H_2 + N_2 \rightarrow 2NH_3$$

$$Q = \frac{(2.4)^2}{(1.6)^3(0.05)} =$$

$$28.125$$

$$28.125 \quad < \quad 3.8 \times 10^4$$

$$Q \qquad\qquad K$$

towards the products

2.

$H_2 + I_2 \rightleftharpoons 2HI$

B	∅	1.2	4.0
eq.	x	1.2 + ~~x~~	4.0 − ~~2x~~
	.07619 M		

assume that the +x and −2x is insignifigent

$$K = \frac{(4.0)^2}{(x)(1.2)} = 175$$

$x = .07619M$

$$\frac{.07619}{1.2} \times 100 = 6.349\%$$

If less than or equal to 10% do not worry about it.

$$\frac{.07619}{4.0} \times 100 = 1.9\%$$

$H_2 + I_2 \rightleftharpoons 2HI$

.07619 $\quad$ 1.2 + .07619 $\quad$ 4.0 − 2(.07619)

.07619 M $\quad$ 1.2761 M $\quad$ 3.84762 M

.076 M $\quad$ 1.3 $\quad$ 3.8

$$C_1 V_1 = C_2 V_2$$