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$RATE_{FWD} = RATE_{REV}$

$aA + bB \rightleftharpoons cC + dD$

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

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

* ~~[illegible]~~ When Q/K for States! e.g. B is a solid

$Q = \frac{[C]^c[D]^d}{[A]^a}$

* States!

aqueous [ ] K_c

Pressures K_p $K = \frac{P_C^c \cdot P_D^d}{P_A^a \cdot P_B^b}$

$K_p = K_c (RT)^{\Delta n}$ ←

$2A + B \rightleftharpoons 2C + D$

If ... Equil amounts of A, B, @ Equil?

$[A] < [B]$ $[C] > [D]$

ICE Chart

I [initial]
C Δ [ ]
E [Equil]

- given K → Solve for x
- given initial, 1 Equil amount
  - Equil
  - K?
- common ion effect

EVERYTHING w/ Dash! * SOLIDS!

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$RATE_{FWD} = RATE_{REV}$

$$aA + bB \rightleftharpoons cC + dD$$

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

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

* WATCH OUT FOR STATES! sug.. B is a solid

$$Q_c = \frac{[C]^c[D]^d}{[A]^a}$$

* GASES!

aq solns [ ] K_c

Pressures K_p $\quad K = \frac{P_C^c \cdot P_D^d}{P_A^a \cdot P_B^b}$

$K_p = K_c (RT)^{\Delta n}$ ←

$$\underline{2}A + B \rightleftharpoons 2C + D$$

If ... EQUIL AMOUNTS of A, B, @ EQUIL?

$[A] < [B] \qquad [C] > [D]$

ICE CHART

I [initial]
C Δ [ ]
E [EQUIL]

- given K → solve for x
- given initial, 1 EQUIL amount → EQUIL → K?
- common ion effect

EVERYTHING IN DISN! * SOLIDS!

Le Chatelier's Principle

* START FROM EQUIL!

Q vs K	
$Q < K$	FWD is FASTER
$Q > K$	REV is FASTER

SHIFT AWAY ADDED

SHIFT TOWARD REMOVED

STATES

EQU WEAK A PRODUCT $\Rightarrow \Delta T \Rightarrow \Delta K$