$$2A(g) \rightleftarrows B(g) + C(g)$$

$$K_c = \frac{[B]_{eq}[C]_{eq}}{[A]_{eq}^2}$$

I + C = E

	[A]	[B]	[C]
I	1.50	0	0
C	-1.00	+0.50	+0.50
E	0.50	0.50	0.50

$$K_c = \frac{[B]_{eq}[C]_{eq}}{[A]_{eq}^2} = \frac{(0.50)(0.50)}{(0.50)^2}$$

$$= 1.0$$

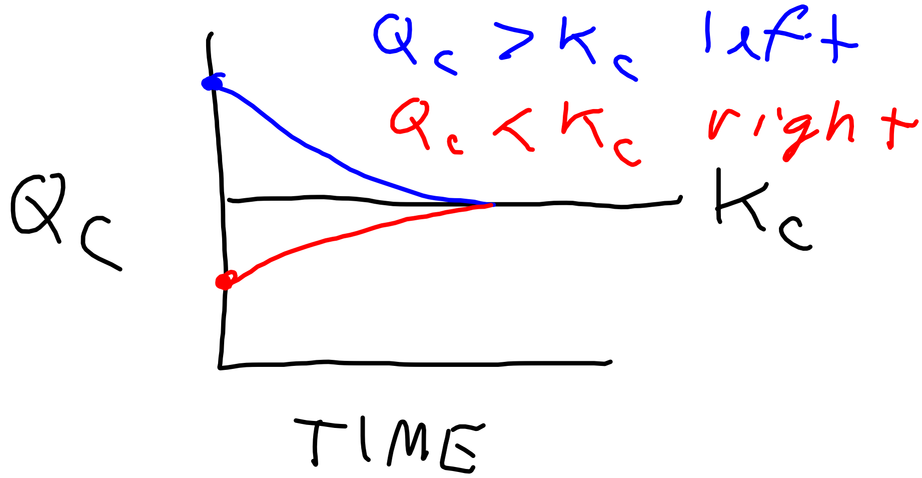
Reaction Quotient:

Q_c

$$aA + bB \rightleftarrows cC + dD$$

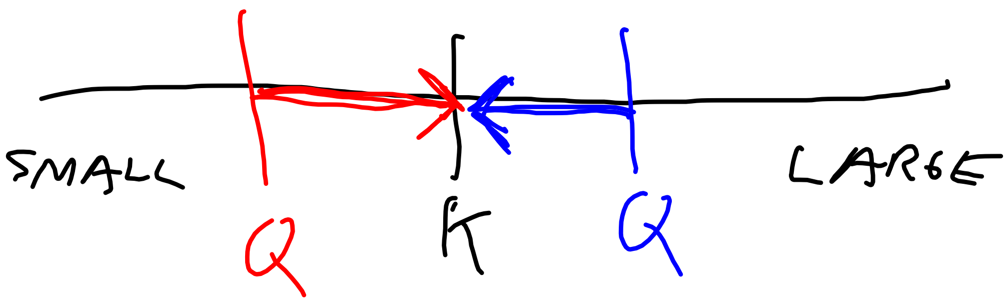
$$Q_c = \frac{[C]^c[D]^d}{[A]^a[B]^b}$$

$Q_c = K_c$ at equilibrium



$K_c < Q_c$ left

$K_c > Q_c$ right



$$aA(g) + bB(g) \rightleftarrows cC(g) + dD(g)$$

$$K_p = \frac{P_{C_{eq}}^{c} \cdot P_{D_{eq}}^{d}}{P_{A_{eq}}^{a} \cdot P_{B_{eq}}^{b}}$$

$$PV = nRT$$

↓ solve for P

$$P = \frac{nRT}{V} = \left(\frac{n}{V}\right)RT$$

$$= MRT$$

$$K_p = \frac{P_{C_g}^{c} \cdot P_{D_g}^{d}}{P_{A_g}^{a} \cdot P_{B_g}^{b}}$$

$$= \frac{([C]_g RT)^c \cdot ([D]_g RT)^d}{([A]_g RT)^a \cdot ([B]_g RT)^b}$$

$$= \frac{[C]_g^c (RT)^c \cdot [D]_g^d \cdot (RT)^d}{[A]_g^a (RT)^a \cdot [B]_g^b \cdot (RT)^b}$$

$$= \frac{[C]_g^c [D]_g^d \cdot (RT)^c \cdot (RT)^d}{[A]_g^a [B]_g^b \cdot (RT)^a \cdot (RT)^b}$$

$$= \frac{[C]_g^c [D]_g^d}{[A]_g^a [B]_g^b} \cdot \frac{(RT)^c (RT)^d}{(RT)^a (RT)^b}$$

$$= \frac{[C]_g^c [D]_g^d}{[A]_g^a [B]_g^b} \cdot \frac{(RT)^{c+d}}{(RT)^{a+b}}$$

$$= K_c \cdot (RT)^{c+d-(a+b)}$$

$\Delta n = c+d-(a+b)$ change in the number of moles of gas

$$K_p = K_c \cdot (RT)^{\Delta n}$$

$R = 0.08206 \frac{L\,atm}{K\,mol}$

T must be in Kelvin

algebra

$$K_c = K_p (RT)^{-\Delta n}$$