

LeChatlier's Principle

System moves away from "Stressor"

Reactants \rightleftharpoons Products

↑ Temp

↑ P (gas)

↑ []

⊕ Catalyst

$2A(g) \rightleftharpoons B(g)$

More Molecules

→

Feb 14-7:37 AM

If Then

$2A(g) \rightleftharpoons B(g)$

If ~~$2A(g)$~~ ↑

Then

$B(g)$ ↑

↑ P on entire system.

Feb 14-7:52 AM



If $\uparrow T$ overall then

Feb 14-7:53 AM

PS15

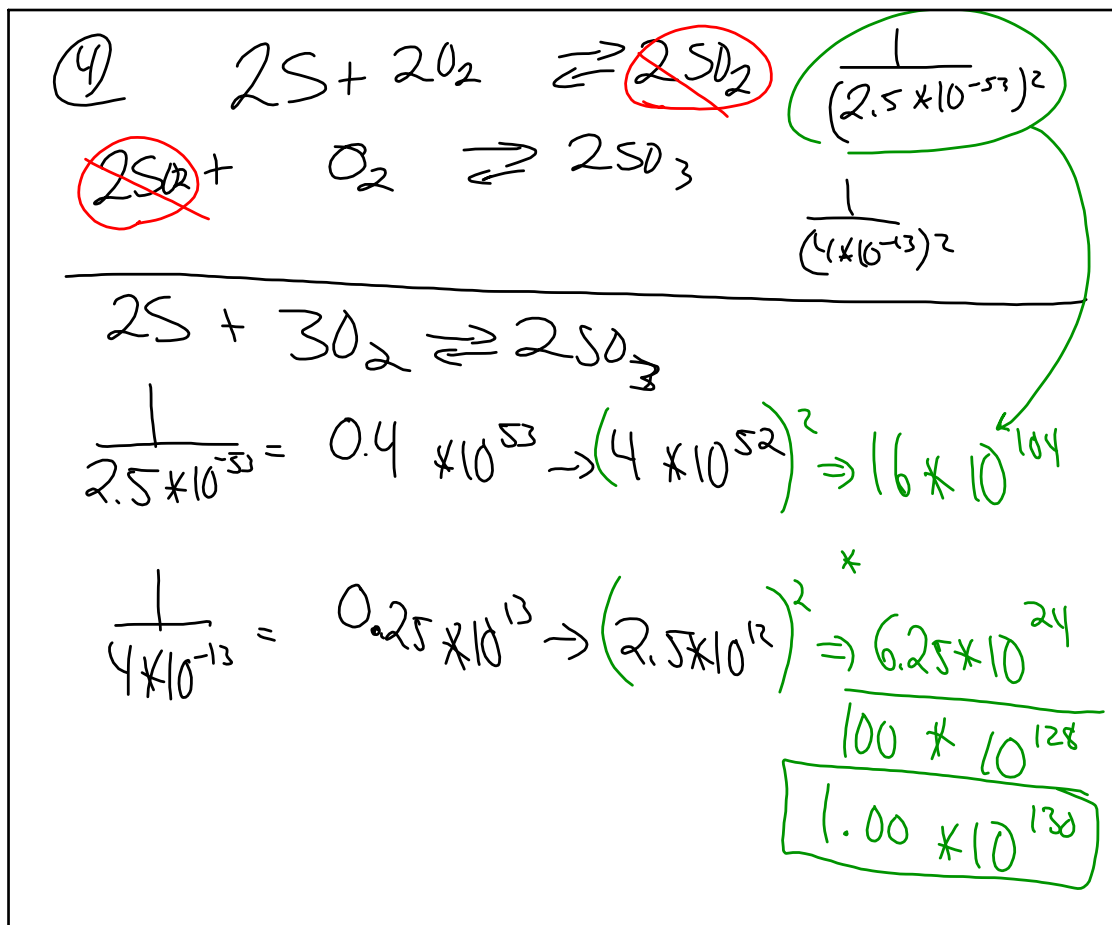


Feb 14-7:58 AM

$$\textcircled{3} \quad K_c = \frac{[HI]^2}{[H_2][I_2]}$$

$$\frac{54}{1} = \frac{[HI]^2}{(0.021)(0.013)}$$

Feb 14-8:01 AM



Feb 14-8:04 AM

$$\textcircled{1} \quad Q = \frac{[\text{Br}_2][\text{Cl}_2]}{[\text{BrCl}]^2} = \frac{(0.05)(0.05)}{(0.05)^2} = 1$$

$$Q = 1 \quad K = 32$$

$Q < K$
Not there yet



Feb 14-8:16 AM

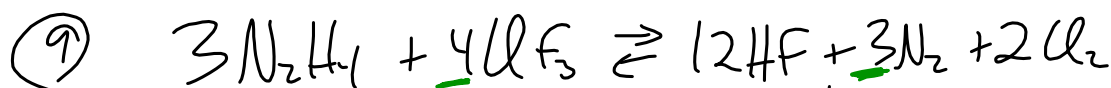


$$K_p = K_c (RT)^{\Delta n} = \text{cancel} - 2 = \text{cancel}$$

$$K_p = K_c (RT)^{\cancel{0}}$$

$$K_p = K_c$$

Feb 14-8:20 AM



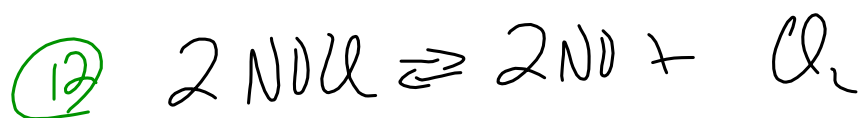
I	0.88M	0.88M	0	0	0
D	-	4(0.525)	+	+0.525	+
E		0.18		0.525	

$$\textcircled{10} \quad K_p = K_c (RT)^{\Delta n}$$

$$6.8 \times 10^5 = K_c (0.08206(298))^{-2}$$

$$\frac{6.8 \times 10^5}{1} = \frac{K_c}{(0.08206(298))^2}$$

Feb 14-8:22 AM



$$Q = \frac{(\text{NO})^2 (\text{Cl}_2)}{(\text{NOCl})^2} = \frac{(1.2)^2 (0.6)}{(1.3)^2} = 0.51$$

$$K = 0.51$$

↔
K < Q

Feb 14-8:26 AM

13) $\text{NH}_3(\text{g}) + \text{H}_2\text{S}(\text{g}) \rightleftharpoons \text{NH}_4\text{HS}(\text{s})$

I	1	1	
Δ	-x	-x	+
E	1-x	1-x	x

$1 - 0.68 = 0.32$

$K_c = 9.7$

$$\frac{1}{1} = \frac{1}{(\text{NH}_3)(\text{H}_2\text{S})} = \sqrt{\frac{1}{(1-x)^2}} = \sqrt{\frac{9.7}{1}}$$

$$\frac{1}{1-x} = 3.11$$

$$\begin{array}{r} 3.11 - 3.11x = 1 \\ -3.11 \qquad -3.11 \\ \hline -3.11x = -2.11 \\ x = 0.68 \end{array}$$

Feb 14-8:37 AM

14) $4\text{P}(\text{Cl}_3)(\text{g}) \rightleftharpoons \text{P}_4(\text{g}) + 6\text{Cl}_2(\text{g})$

I	1		
Δ	-4x	+x	+6x
E	1-4x	x	6x

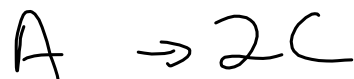
MOLE RATIO

$$K_c = \frac{(\text{P}_4)(\text{Cl}_2)^6}{(\text{P}(\text{Cl}_3))^4} = \frac{(x)(6x)^6}{(1-4x)^4}$$

Feb 14-8:43 AM

E206

①



$$\frac{2}{1} \times \frac{-\Delta(A)}{\Delta t} = \frac{+1}{2} \frac{\Delta(C)}{\Delta t} \times \frac{2}{1}$$

Feb 14-8:56 AM

④

$$E_a = 123 \text{ kJ}$$

$$k_1 = 0.2 \text{ sec}^{-1} \text{ at } T_1 = 311 \text{ K}$$

$$k_2 = 0.4 \quad T_2 = ?$$

$$\ln \frac{k_1}{k_2} = \frac{E_a}{R} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\ln \frac{0.2}{0.4} = \frac{123}{8.314 \times 10^3} \left(\frac{1}{T_2} - \frac{1}{311} \right)$$

$$(8.314 \times 10^3) \times 0.693$$

$$\frac{123}{8.314 \times 10^3} = \left(\frac{1}{T_2} - \frac{1}{311} \right)$$

$$\frac{1}{311} + \frac{1}{311} = \frac{1}{T_2}$$

$$= \frac{1}{T_2}$$

Feb 14-9:09 AM



$$\text{Rate} = k[A]^2 [B]^0$$

Feb 14-9:15 AM