Lecture 8.4 K_c & K_p manipulations

Note Title 9/19/2011

Conc. $2SO_{3(g)} + O_{2(g)} \rightleftharpoons 2SO_{4(g)}$ $K_c = \underline{1.0257 \times 10^{12}}$ @ 500K

i. $[SO_3]$ $[O_2]$ $[SO_4]$

favor products.

concentration

$$K_c = \frac{[SO_4]^2}{[SO_3]^2[O_2]}$$

Partial Pressure

$2SO_{3(g)} + O_{2(g)} \rightleftharpoons 2SO_{4(g)}$ $K_p = \underline{\ ?\ }$

i P_{SO_3} P_{O_2} P_{SO_4}

$$K_p = \frac{P_{SO_4}^2}{P_{SO_3}^2 \cdot P_{O_2}}$$

$$K_c \neq K_p$$

Conversion of K_p & K_c

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

Temp Kelvins. (T)

Δn ← ?

R: $0.0820578 \frac{L\,atm}{mol\,K}$

$$2SO_3 + O_2 \rightleftharpoons 2SO_4$$

$$\underbrace{SO_3 + SO_3 + O_2}_{3} \rightleftharpoons \underbrace{SO_4 + SO_4}_{2}$$

Δn = # prod species − # reactant species

= 2 − 3

= −1

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

$$(1.0257 \times 10^{12})(0.0820578 \cdot 500K)^{-1} = K_p$$

$K_p = 2.50 \times 10^{10}$ Large... Product.