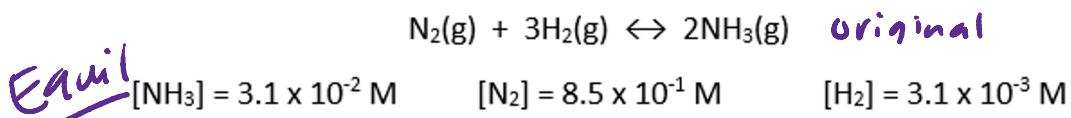


Day 8.2 Manipulating K

Friday, March 15, 2019 7:28 AM

- ① Flip eqn = Reciprocal of $K = \frac{1}{\text{original } K}$
- ② Multiply Coefficients by "y" = raise to the power of "y"
 $(\text{original } K)^y$
- ③ Add eqns = Multiply All K's

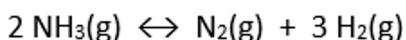
1. The following equilibrium concentrations were observed for the reaction at 127°C :



- a. Calculate the value of K at 127°C for this reaction.

$$K_c = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3} = \frac{(3.1 \times 10^{-2})^2}{(8.5 \times 10^{-1})(3.1 \times 10^{-3})^3} = \boxed{3.8 \times 10^4}$$

- b. Calculate the value of K at 127°C for the reaction:

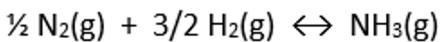


FLIP $\nu - \frac{1}{2.8 \times 10^4} = \boxed{2.8 \times 10^{-5}}$

FLIP

$$K = \frac{1}{3.8 \times 10^4} = \boxed{2.6 \times 10^{-5}}$$

c. Calculate the value of K at 127°C for the reaction given by the equation:



Mult. by $\frac{1}{2}$

$$K = (3.8 \times 10^4)^{1/2} = \boxed{190}$$

2. At 25°C, $K_c = 2.2 \times 10^{-3}$ for the reaction $ICl(g) \leftrightarrow \frac{1}{2} I_2(g) + \frac{1}{2} Cl_2(g)$ original

a. Calculate K_c at 25°C for $2 ICl(g) \rightarrow I_2(g) + Cl_2(g)$

Mult. by 2

$$K = (2.2 \times 10^{-3})^2 = \boxed{4.8 \times 10^{-6}}$$

b. Calculate K_c at 25°C for $2 I_2(g) + 2 Cl_2(g) \rightarrow 4 ICl(g)$

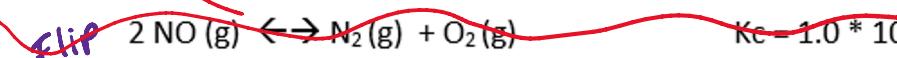
Flip and Mult. by 4

$$\frac{1}{(2.2 \times 10^{-3})^4} = \boxed{4.3 \times 10^{10}}$$

3. Given the following data at 25 °C

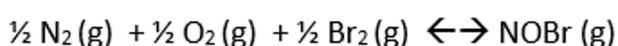


$$K_c = 2.0 * 10^3$$



Calculate K_c for the following reaction:

GOAL



$$K_c = (2 \times 10^3)(1 \times 10^{-30}) = (2 \times 10^{-27})^{1/2}$$

$$K_c = 4.5 \times 10^{-14}$$