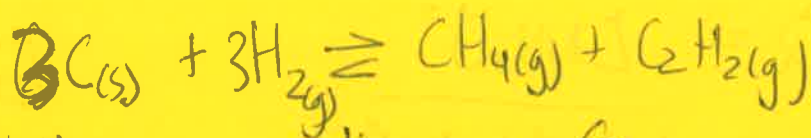


Reaction Quotient Hmwk

pg 460 #81-84



$$\begin{aligned} 81) Q &= \frac{[CH_4][C_2H_2]}{[H_2]^3} \\ &= \frac{(2.13)(1.77)}{(0.34)^3} \\ &= 95.92 \end{aligned}$$

$$K_{eq} < Q$$

35.5 95.92

towards reactants



82)



$$\begin{aligned} [HI] &= 9.00 \text{ mol} / 3.00 \text{ L} = 3.0 \text{ M} \\ [H_2] &= 6.00 \text{ mol} / 3.00 \text{ L} = 2.0 \text{ M} \\ [I_2] &= 4.5 \text{ mol} / 3.00 \text{ L} = 1.5 \text{ M} \end{aligned}$$

$$\begin{aligned} Q &= \frac{[HI]^2}{[H_2][I_2]} \\ &= \frac{(3)^2}{(2)(1.5)} \\ &= 3 \end{aligned}$$

$$K_{eq} > Q$$

500 3

towards products



83)



$$\begin{aligned} Q &= \frac{[PCl_3][Cl_2]}{[PCl_5]} \\ &= \frac{(1.21)(0.44)}{(0.77)} \\ &= 0.77 \end{aligned}$$

$$Q > K_{eq}$$

0.77 0.041

towards reactants



84)



$$Q = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$$

$$Q = \frac{(2.00 \times 10^{-4})^2}{(1.5 \times 10^{-5})(0.354)^3}$$

$$Q = 0.06$$

$$Q \approx 0.06$$

$$K_{eq} = 0.06$$

\therefore approx. @
equilibrium