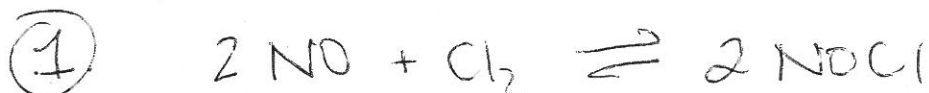


Equilibrium Short Answer

Review



	I	0.40	0.40	\neq
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	C	-0.12	-0.060	+ 0.12
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	E	0.28	0.34	0.12
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$$K_{eq} = \frac{[0.12]^2}{[0.28]^2 [0.34]} = \boxed{0.54}$$



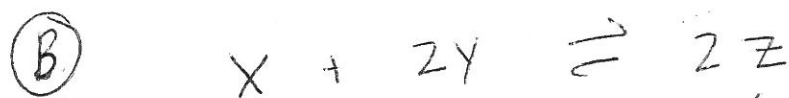
① I 0.20 0.50 \neq

C -0.06 -0.12 +0.12

E 0.14 0.38 0.12

$$K_{eq} = \frac{[0.12]^2}{[0.14][0.38]^2}$$

$$= \boxed{0.71}$$



I 0.20 0.50 \neq

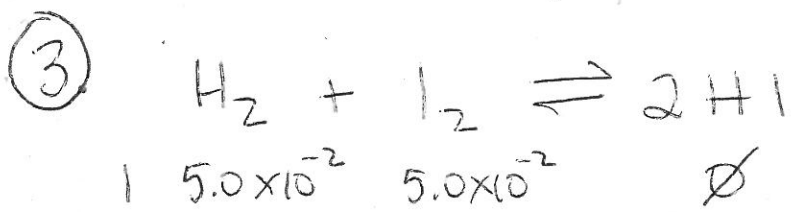
C -0.18 -0.36 +0.36

E 0.02 0.14 0.36

$$K_{eq} = \frac{[0.36]^2}{[0.02][0.14]^2}$$

$$\approx \boxed{300}$$

④ Because with increased Temperature the value of K_{eq} increased, the heat term must be on the reactant side \therefore endothermic



I 5.0×10^{-2} 5.0×10^{-2} \emptyset

C $-x$ $-x$ $+2x$

E $5.0 \times 10^{-2} - x$ $5.0 \times 10^{-2} - x$ $2x$

$$\sqrt{49.0} = \sqrt{\frac{(2x)^2}{(5.0 \times 10^{-2} - x)^2}}$$

$$7 = \frac{2x}{5.0 \times 10^{-2} - x}$$

$$7(5.0 \times 10^{-2} - x) = 2x$$

$$0.35 - 7x = 2x$$

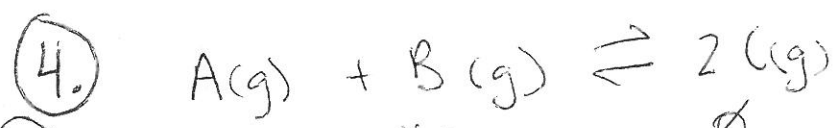
$$0.35 = 2x + 7x$$

$$\frac{0.35}{9} = \frac{9x}{9}$$

$$\rightarrow X = 0.039$$

$$\therefore 2x = 0.078 M$$

$$\boxed{[HI]_E = 0.078 M}$$



a) I 4.0 4.0 \emptyset

C $-x$ $-x$ $+2x$

E $4.0 - x$ $4.0 - x$ $2x$

$$\sqrt{72.0} = \frac{(2x)^2}{(4.0 - x)^2}$$

$$\cong 8.49 = \frac{2x}{4.0 - x}$$

$$8.49(4.0 - x) = 2x$$

$$33.9 - 8.49x = 2x$$

$$33.9 = 2x + 8.49x$$

$$\frac{33.9}{10.485} = \frac{10.485x}{10.485}$$

$$\rightarrow X = 3.238$$

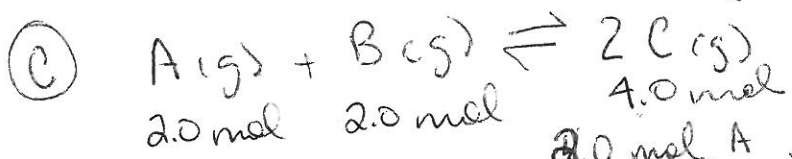
$$[A] = 4.0 - 3.238$$

$$[A] \cong 0.76 M$$

$$\rightarrow \boxed{[A]_E = 0.8 M}$$

b) $2x = C \rightarrow 2(3.238 \frac{mol}{L}) \Rightarrow \frac{6.47 mol}{L} \times 0.50 L$

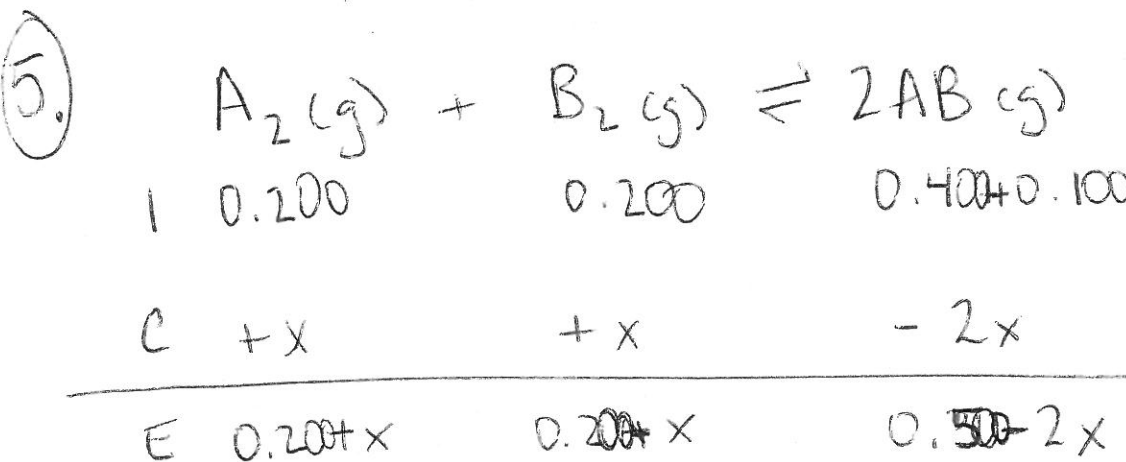
(actual) $\Rightarrow \boxed{3.2 mol C}$



$$\frac{2.0 mol A}{1 mol A} \times \frac{2 mol C}{2 mol A} = 4.0 mol C = \boxed{4.0 mol C}$$

(corrected)

$$\text{d. } P.Y = \frac{\text{Actual}}{\text{Expected}} \times 100\% \rightarrow \frac{3.2 \text{ mol C}}{4.0 \text{ mol C}} \times 100\% = \boxed{8.0 \times 10^1 \%}$$



$$\sqrt{4} = \sqrt{\frac{(0.500 - 2x)^2}{(0.200 + x)^2}}$$

$$2 = \frac{0.500 - 2x}{0.200 + x}$$

$$K_{eq} = \frac{(0.400)^2}{(0.2)(0.2)} = \frac{0.16}{0.04} = \boxed{4.00}$$

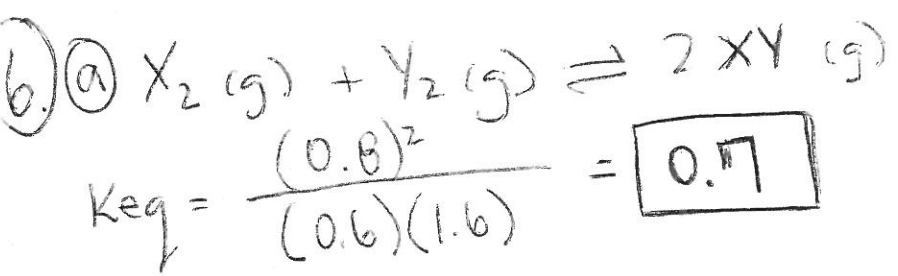
$$2(0.200 + x) = 0.500 - 2x$$

$$0.400 + 2x = 0.500 - 2x$$

$$\frac{4x}{4} = \frac{0.100}{4} \rightarrow \boxed{x = 0.025}$$

$$\therefore 0.500 - 2(0.0250)$$

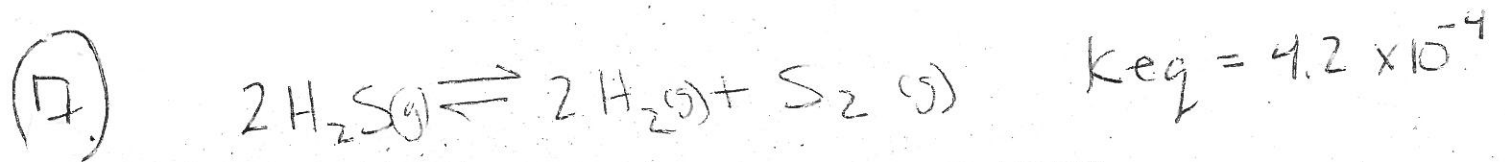
$$\boxed{[AB] = 0.450M}$$



b)

$$K_{eq} = \frac{(1)^2}{(0.5)(1.5)} \approx \boxed{1.33}$$

The reaction is endothermic because the products are favored with an increase in temperature.



$$\text{Trial } K_{eq} = \frac{[0.200]^2 [0.015]}{[0.050]^2} = \boxed{0.24}$$

B/c Trial $K_{eq} > K_{eq}$ the reaction is NOT @ equilibrium and it must shift to the REACTANTS to reach equilibrium.