#68498 Chemistry, Other

A student placed the same chemical amount of $SO_{2(g)}$ and $NO_{2(g)}$ into a 1.0 L container. At equilibrium, the concentration of both $SO_{3(g)}$ and $NO_{(g)}$ was 0.30 mol/L. What was the equilibrium concentration of $SO_{2(g)}$ and $NO_{2(g)}$? Kc= 9.5

$SO_{2(g)}+NO_{2(g)}$--> $SO_{3(g)}+NO_{(g)}$

Answer:

	SO_2	NO_2	NO	SO_3
Initial	0.3	0.3	0	0
Change	-x	-x	+x	+x
Equilibrium	0.3-x	0.3-x	0+x	0+x

$$K_{eq} = \frac{[NO][SO_3]}{[SO_2][NO_2]}$$

$$9.5 = \frac{x^2}{[0.3-x][0.3-x]}$$

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x = 0.23

Therefore, equilibrium concentrations will be:

	SO_2	NO_2	NO	SO_3
Equilibrium	0.07	0.07	0.23	0.23