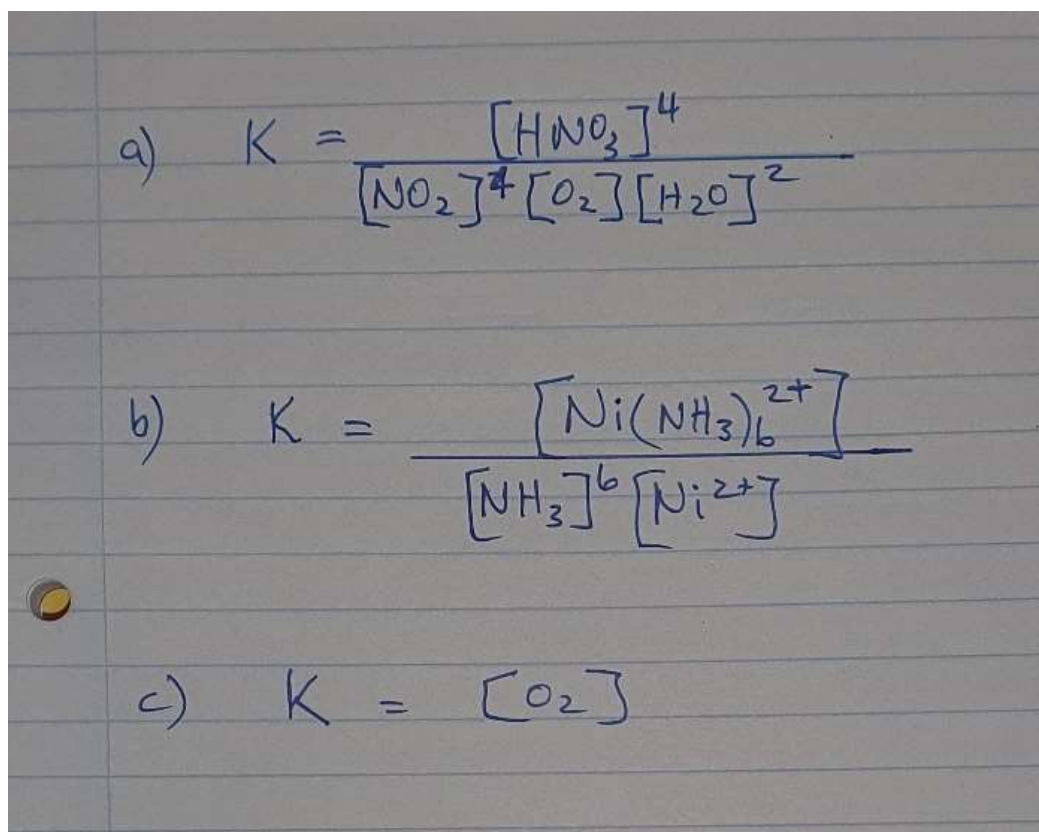
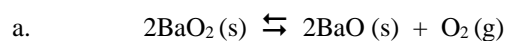
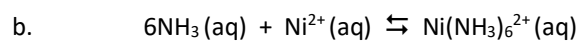
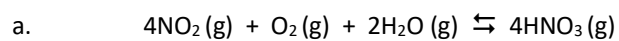


ANSWER TO "TRY YOURSELF" PROBLEM FROM STUDY SECTION 7.2

Try Yourself 7.2 a

Write an equilibrium constant expression for each chemical equation.



Try Yourself 7.2 b

A 4.00 L flask is filled with 0.75 mol SO₃, 2.50 mol SO₂ and 1.30 mol O₂, and allowed to reach equilibrium according to:



Calculate the reaction quotient Q and deduce in which direction the reaction above will proceed to reach equilibrium at the reaction conditions concerned if K_c = 12 mol/L at 25 °C.

Handwritten solution for the reaction quotient Q and equilibrium direction:

Reaction: $2\text{SO}_3(\text{g}) \rightleftharpoons 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$

Concentrations:

$\text{SO}_3: c = \frac{n}{V} = \frac{0.75 \text{ mol}}{4 \text{ L}} = 0.1875 \text{ M}$	$\text{SO}_2: c = \frac{n}{V} = \frac{2.50 \text{ mol}}{4 \text{ L}} = 0.625 \text{ M}$	$\text{O}_2: c = \frac{n}{V} = \frac{1.30 \text{ mol}}{4 \text{ L}} = 0.325 \text{ M}$
--	---	--

Reaction Quotient Q:

$$Q = \frac{[\text{SO}_2]^2 [\text{O}_2]}{[\text{SO}_3]^2}$$
$$= \frac{(0.625)^2 (0.325)}{(0.1875)^2}$$
$$= \frac{(0.391)(0.325)}{0.0352}$$
$$= 3.61$$

Equilibrium Constant K:

$$K = 12$$

Comparison:

$$\therefore Q < K$$
$$3.61 < 12$$

Conclusion:

\therefore Reaction still not at equilibrium.
Reaction will proceed from left to right, increasing the product concentrations.