Le Chatelier's Principle Problems

1. Explain how the given action affects the equilibrium for the following reaction.

$$SO_2 (g) + NO_2 (g) \rightleftharpoons SO_3 (g) + NO (g) + heat$$

Action	Direction of shift	Effect on [SO_2]	Effect on [NO_2]	Effect on [SO_3]	Effect on [NO]
Remove NO_2					
Add NO_2					
Increase Pressure					
Lower Temperature					
Add SO_3					

2. Given the reaction at equilibrium : $N_2 (g) + O_2 (g) \rightleftharpoons 2 NO (g)$

   If the temperature remains constant and the pressure increases, the number of moles of NO(g) will

   (A) decrease   (B) increase   (C) remain the same

   Ans: _____

3. Given the reaction at equilibrium : $N_2 (g) + O_2 (g) + energy \rightleftharpoons 2 NO(g)$

   Which change will result in a decrease in the amount of NO(g) formed ?

   (A) decreasing the pressure   (B) decreasing the concentration of N_2 (g)

   (C) increasing the concentration of O_2 (g)   (D) increasing the temperature

   Ans: _____

4. What would happen to the position of equilibrium when the following changes are made to the reaction below?

   $$2 Hg_3O (g) \rightleftharpoons 6 Hg (g) + O_2 (g) \qquad \Delta H = - 25kJ/mol$$

   (a) Hg_3O is added to the system   _____

   (b) The volume of the system decreases   _____

   (c) Temperature is increased   _____

Le Chatelier's Principle Problems

1. Explain how the given action affects the equilibrium for the following reaction.

$$SO_2 \text{ (g)} + NO_2 \text{ (g)} \rightleftharpoons SO_3 \text{ (g)} + NO \text{ (g)} + heat$$

Action	Direction of shift	Effect on $[SO_2]$	Effect on $[NO_2]$	Effect on $[SO_3]$	Effect on $[NO]$
Remove NO_2	←	↑	↑	↓	↓
Add NO_2	→	↓	↓	↑	↑
Increase Pressure	No Change	No Change	No Change	No Change	No Change
Lower Temperature	→	↓	↓	↑	↑
Add SO_3	←	↑	↑	↓	↓

2. Given the reaction at equilibrium : $N_2 \text{ (g)} + O_2 \text{ (g)} \rightleftharpoons 2 \, NO \text{ (g)}$

   If the temperature remains constant and the pressure increases, the number of moles of NO(g) will

   (A) decrease   (B) increase   (C) remain the same

   Ans: ____C____

3. Given the reaction at equilibrium : $N_2 \text{ (g)} + O_2 \text{ (g)} + energy \rightleftharpoons 2 \, NO(g)$

   Which change will result in a decrease in the amount of NO(g) formed ?

   (A) decreasing the pressure   (B) decreasing the concentration of N_2 (g)

   (C) increasing the concentration of O_2 (g)   (D) increasing the temperature

   Ans: ____B____

4. What would happen to the position of equilibrium when the following changes are made to the reaction below?

   $$2 \, Hg_3O \text{ (g)} \rightleftharpoons 6 \, Hg \text{ (g)} + O_2 \text{ (g)} \qquad \Delta H = -25kJ/mol$$

   (a) Hg_3O is added to the system   Right

   (b) The volume of the system decreases   Left

   (c) Temperature is increased   Left