

Tutorial #1 Le Chatelier's Principle

Define **Le Chatelier's Principle**:

What happens when **concentration** is changed by adding or removing a reactant or product?

What happens when concentration is changed by **changing the PRESSURE**?

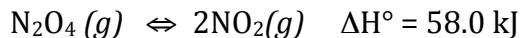
What happens with **temperature** is changed?

Catalysts

What effect do they have on equilibrium?

Sample Exercise 15.12

Consider the equilibrium :



In which direction will the equilibrium shift when (a) N_2O_4 is added, (b) NO_2 is removed, (c) the pressure is increased by the addition of N_2 , (d) the volume is increased, (e) the temperature is decreased?

Practice Exercise 2

In which direction will the equilibrium shift when (a) $\text{Cl}_2(g)$ is removed, (b) the temperature is decreased, (c) the volume of the reaction system is increased, (d) $\text{PCl}_3(g)$ is added.

Practice Exercise 2

Using the thermodynamic data in Appendix C , determine the enthalpy change for the reaction: $\text{POCl}_3(g) \rightleftharpoons 2\text{PCl}_3(g) + \text{O}_2(g)$

Use this result to determine how the equilibrium constant for the reaction should change with temperature.