Le-Chatelier Principle

At the equilibrium of reversible reaction, if any of the factors (temperature, pressure and concentration) is changed, the position of the equilibrium will shift in such a direction that the effect of change of factors is relieved.

Effect of temperature (exothermic reaction)

A+B--->C+D+Energy

Or, A+B--->C+D; ∇H=-ve

Temperature *increase*	Temperature *decrese*
Rate of forward reaction<Rate of backward reaction	Rate of forward reaction>Rate of backward reaction
Equilibrium shift **left ward**	Equilibrium shift **right ward**
Product concentration **decrease**	Product concentration **increase**

Effect of pressure

N_2+3H_2--->$2NH_3$

Total mol more on left side

Pressure *increase*	Pressure *decrease*
Rate of forward reaction>Rate of backward reaction	Rate of forward reaction<Rate of backward reaction
Equilibrium shift **right ward**	Equilibrium shift **left ward**
Product concentration **increase**	Product concentration **decrease**

Effect of pressure

PCl_5--->PCl_3+Cl_2

Total mol more on right side

Pressure *increase*	Pressure *decrese*
Rate of forward reaction<Rate of backward reaction	Rate of forward reaction>Rate of backward reaction
Equilibrium shift **left ward**	Equilibrium shift **right ward**
Product concentration **decrease**	Product concentration **increase**

Effect of pressure

H_2+I_2--->2HI

Total mol equal on both side

Pressure *increase*	Pressure *decrease*
No effect	No effect

Effect of pressure

Only applicable for gasses as pressure doesn't affect solid or liquid.

Effect of concentration

Reactant--->product

Concentration *increase*	Concentration *decrease*
Rate of forward reaction>Rate of backward reaction	Rate of forward reaction<Rate of backward reaction
Equilibrium shift **right ward**	Equilibrium shift **left ward**
Product concentration **increase**	Product concentration **decrease**

Effect of temperature (endothermic reaction)

A+B--->C+D-Energy

Or, A+B--->C+D; ∇H=+ve

Temperature *increase*	Temperature *decrese*
Rate of forward reaction>Rate of backward reaction	Rate of forward reaction<Rate of backward reaction
Equilibrium shift **right ward**	Equilibrium shift **left ward**
Product concentration **increase**	Product concentration **decrease**

By **Tazz** (Tonoya)
cheatography.com/tonoya/

Published 9th November, 2024.
Last updated 9th November, 2024.