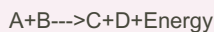


### Le-Chatelier Principle

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.

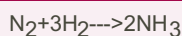
#### Effect of temperature (exothermic reaction)



Or,  $A+B \rightleftharpoons C+D$ ;  $\Delta H = -ve$

Temperature <i>increase</i>	Temperature <i>decrease</i>
Rate of forward reaction < Rate of backward reaction	Rate of forward reaction > Rate of backward reaction
Equilibrium shift <b>left ward</b>	Equilibrium shift <b>right ward</b>
Product concentration <b>decrease</b>	Product concentration <b>increase</b>

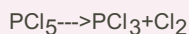
#### Effect of pressure



Total mol more on left side

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

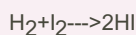
#### Effect of pressure



Total mol more on right side

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

#### Effect of pressure



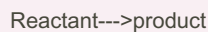
Total mol equal on both side

Pressure <i>increase</i>	Pressure <i>decrease</i>
No effect	No effect

#### Effect of pressure

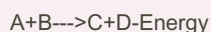
Only applicable for gasses as pressure doesn't affect solid or liquid.

#### Effect of concentration



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

#### Effect of temperature (endothermic reaction)



Or,  $A+B \rightleftharpoons C+D$ ;  $\Delta H = +ve$

Temperature <i>increase</i>	Temperature <i>decrease</i>
Rate of forward reaction > Rate of backward reaction	Rate of forward reaction < Rate of backward reaction
Equilibrium shift <b>right ward</b>	Equilibrium shift <b>left ward</b>
Product concentration <b>increase</b>	Product concentration <b>decrease</b>



