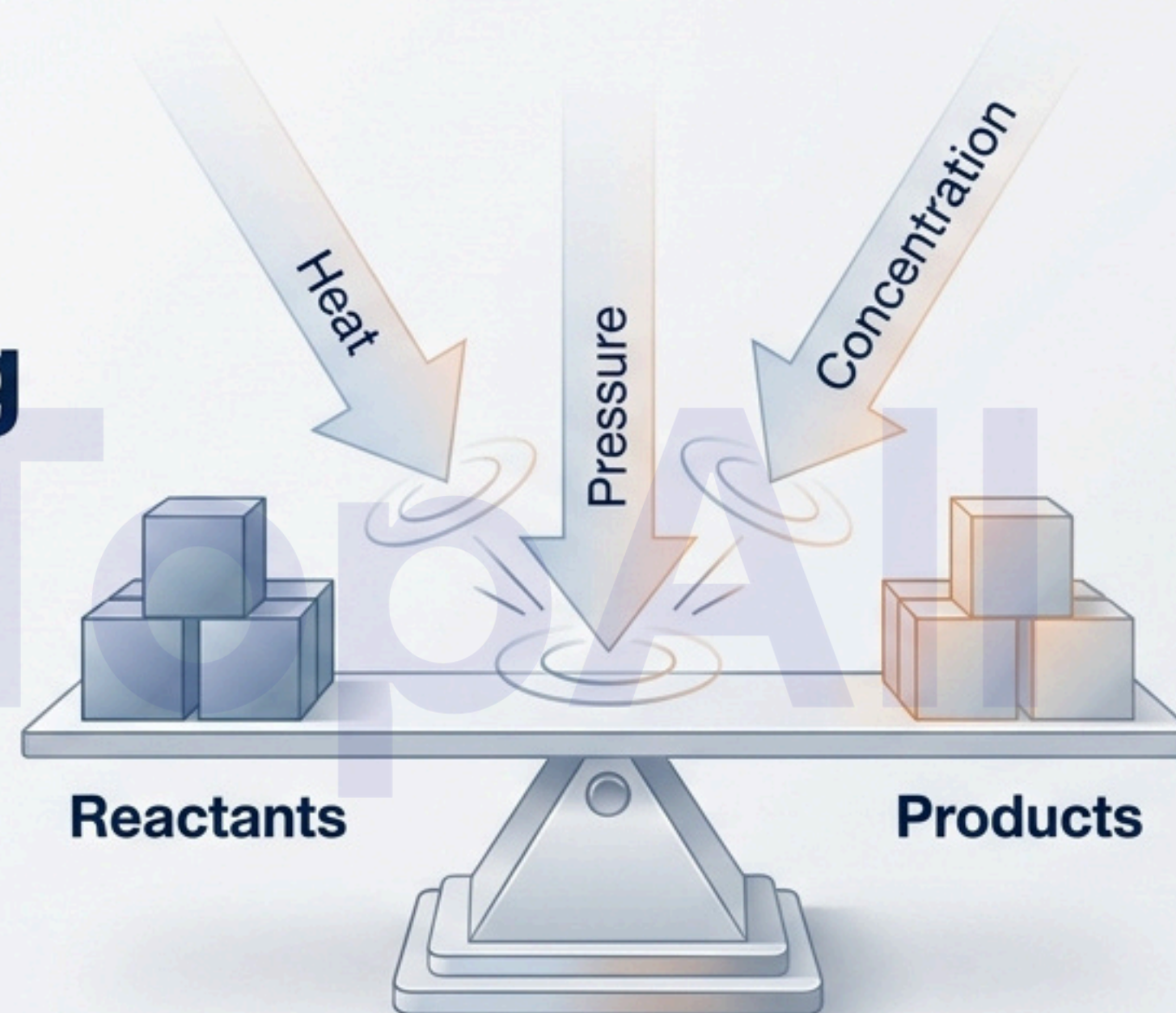


6.8 Factors Affecting Equilibria Asanca

How dynamic equilibrium responds to external change



The Governing Law

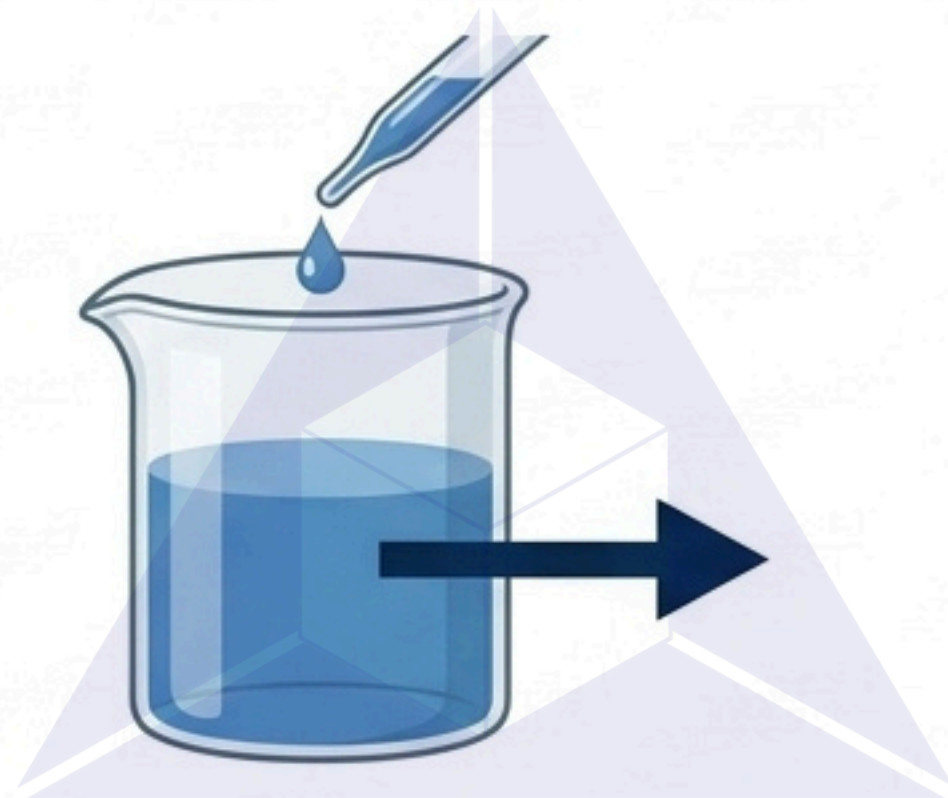
When a change in any of the factors that determine the equilibrium conditions of a system is introduced, the system will change in such a manner so as to reduce or counteract the effect of the change.



Essentially: The system always opposes the imposed change.

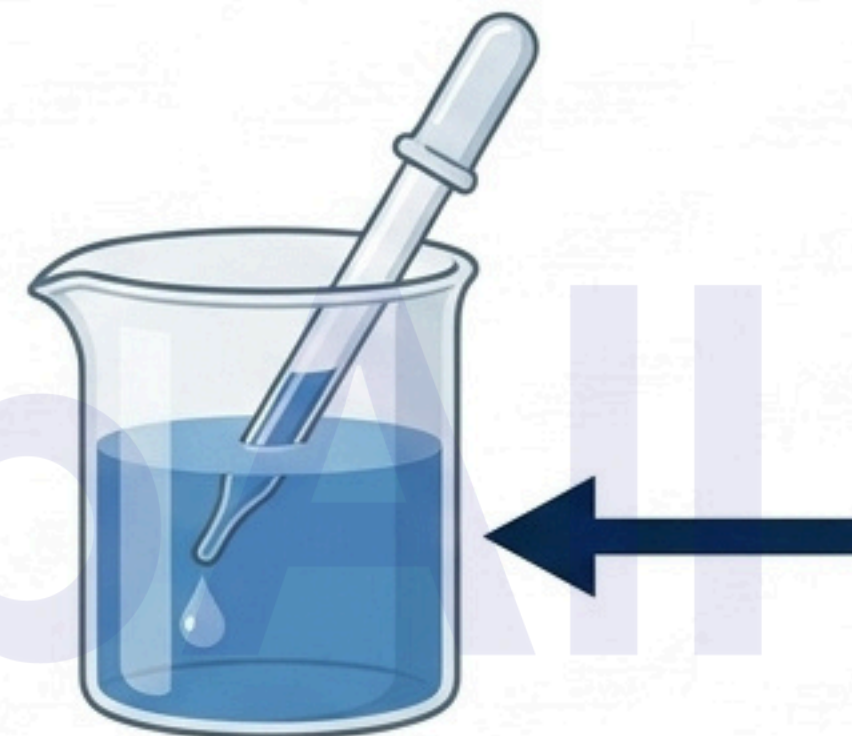
Effect of Concentration

Adding Reactant or Product

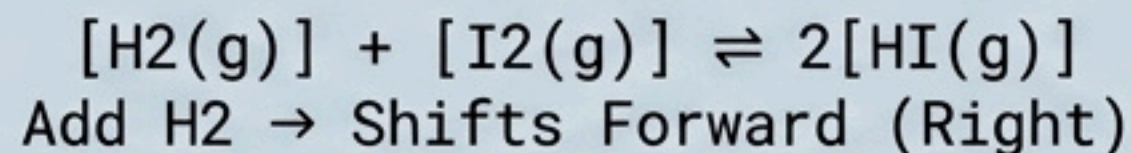


The system consumes the added substance by shifting the net reaction in the opposite direction.

Removing Reactant or Product



The system replenishes the removed substance by shifting the net reaction toward it.





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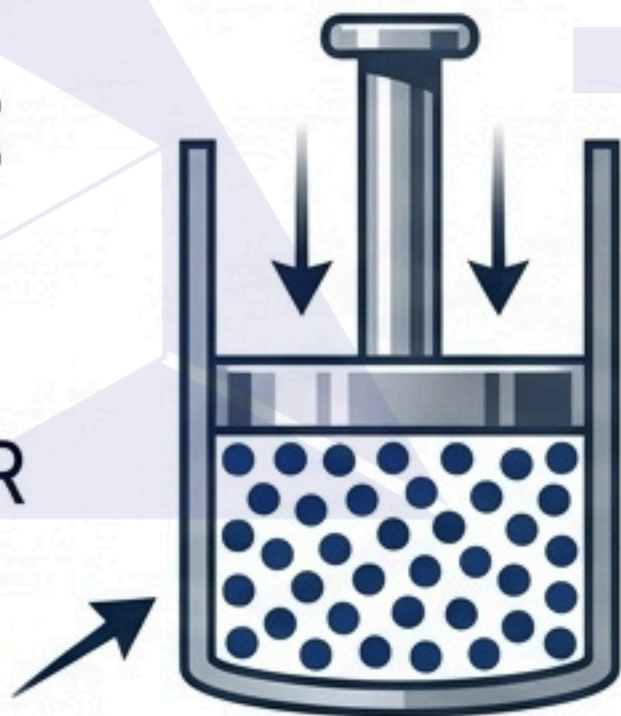


Effect of Pressure

Pressure changes primarily affect gaseous equilibria. The system responds by shifting to alter the total number of gas molecules.

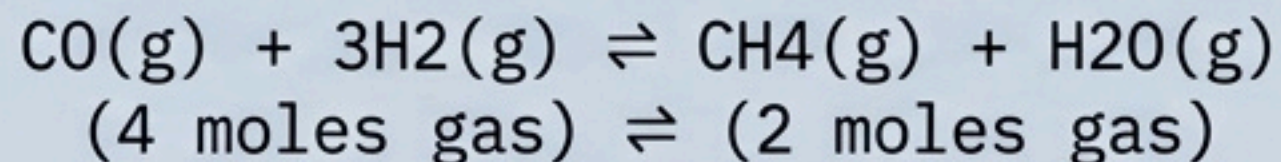
Pressure INCREASE (Volume Decrease)

→ Shifts toward the direction with FEWER moles of gas.



Pressure DECREASE (Volume Increase)

→ Shifts toward the direction with MORE moles of gas.



Increase Pressure → Shifts Forward (Right)

Effect of Temperature

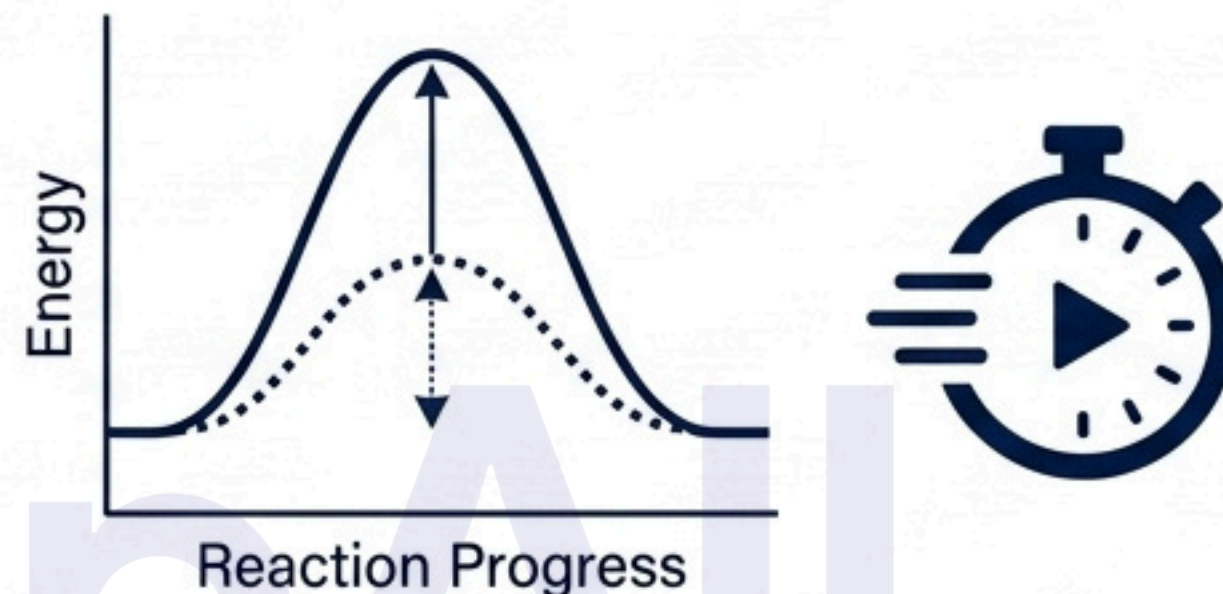
NEET Alert: Temperature is the ONLY factor that changes the actual value of the Equilibrium Constant (K_c).

	Exothermic ($\Delta H < 0$)	Endothermic ($\Delta H > 0$)
 Temp Increase	Shifts Backward (Left) K_c Decreases	Shifts Forward (Right) K_c Increases
 Temp Decrease	Shifts Forward (Right) K_c Increases	Shifts Backward (Left) K_c Decreases

Nuances: Catalysts & Inert Gases

The Role of a Catalyst

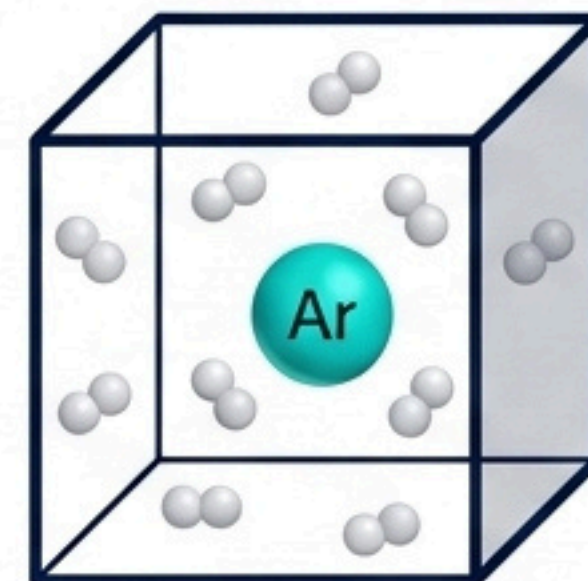
A catalyst lowers activation energy for BOTH forward and reverse reactions equally. It increases the rate of reaching equilibrium, but it **DOES NOT** change the final equilibrium composition **or the value of K_c** .



Addition of an Inert Gas

An inert gas (e.g., Argon) does not participate in the reaction.

At Constant Volume, there is **NO** effect on equilibrium because the partial pressures of the reacting gases remain unchanged.



Key Takeaways



The Opposition Principle

According to Le Chatelier, a system at equilibrium will always shift to oppose and minimize any imposed external change.



The Equilibrium Position Shifts

Changes in concentration, pressure, and temperature will alter the direction of the reaction to relieve stress. Remember: Only temperature alters the actual Equilibrium Constant (K_c).



Catalysts Do Not Change the Destination

A catalyst will get the system to equilibrium much faster, but it has zero effect on K_c or the final composition of the equilibrium mixture.



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