YAKEEN NEET 2.0

2026

Chemical Equilibrium

Physical Chemistry | Lecture -01

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Topics to be covered

1. Introduction of Equilibrium
2. Physical equilibrium, Chemical equilibrium
3. Chemical Equilibrium Characteristics.
4. Home work from modules

Irreversible Reaction

Rxns in which Product can't give back reactants.

$NaCl(aq.) + AgNO_3(aq.) \longrightarrow \underset{\text{p.p.t.}}{AgCl(s)\downarrow} + NaNO_3(s)$

$HCl(aq.) + NaOH(aq.) \longrightarrow NaCl(aq.) + H_2O(l)$

Reversible Reaction

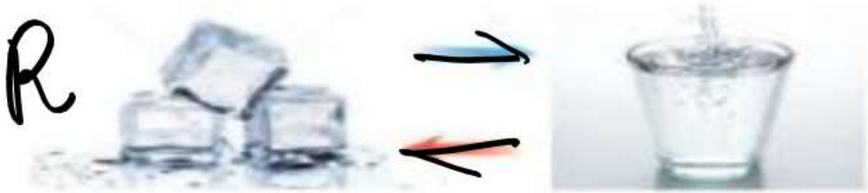
$rⁿ$ s in which product can combine to give reactants.

$$H_2(g) + I_2(g) \underset{\text{backward } rⁿ}{\overset{\text{forward } rⁿ}{\rightleftharpoons}} 2HI(g)$$

Eg. Concept → Reversible $rⁿ$

2. Look at the pictures and choose if the changes are reversible or irreversible.

R



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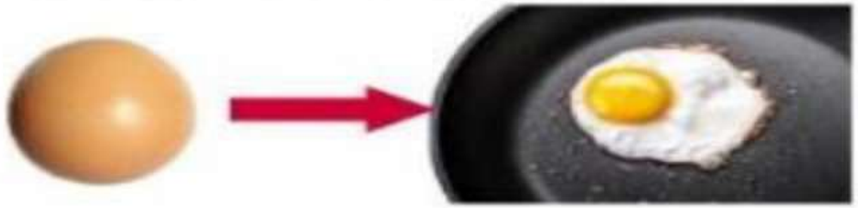

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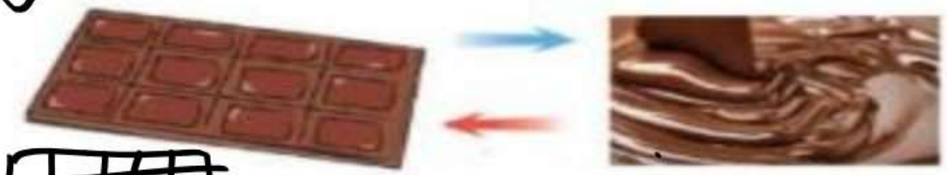

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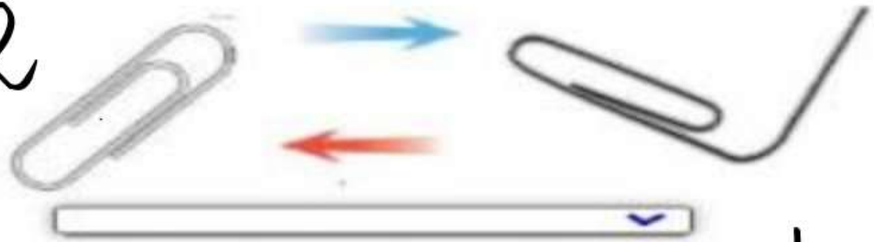

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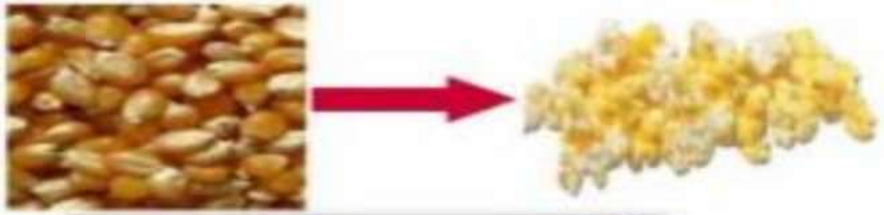

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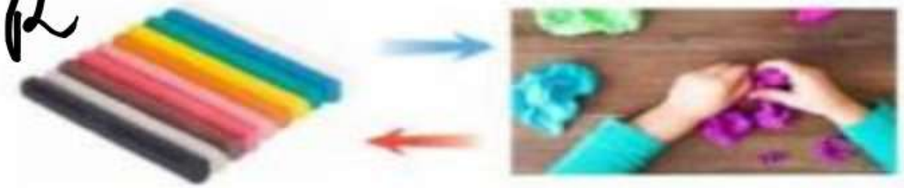

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Equilibrium

Eq. is state when rate of forward rn = rate of backward rn.

$H_2O(s) \rightleftharpoons H_2O(l)$

$T = 0^\circ C = 273K$
$P = 1atm$

$= \square\!=\!\square\!=\!\square\!=\!\rightarrow H_2O(l)$

Ice
$H_2O(s)$

1 sec → 6g ice melt.
1 sec → 6g water freeze

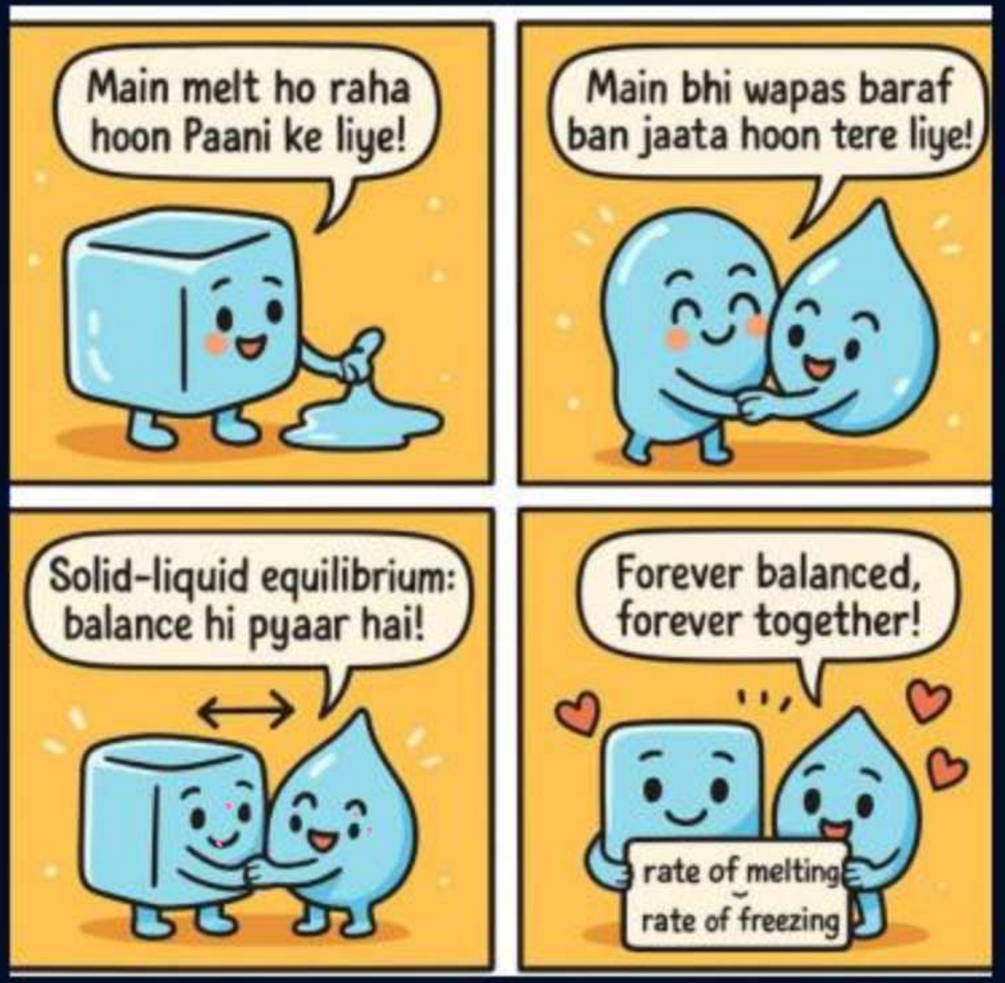
rt of melting of ice = rt of freezing of water

50 students
1 student
49 students

Physical Equilibrium

Types of Phy. eq.

Solid-Liquid Equilibrium



Liquid - Gas Equilibrium

$H_2O(l) \underset{\text{Cond.}}{\overset{\text{evap.}}{\rightleftharpoons}} H_2O(g)$

rate of evaporation = rate of Condensation

Solid-Gas Equilibrium

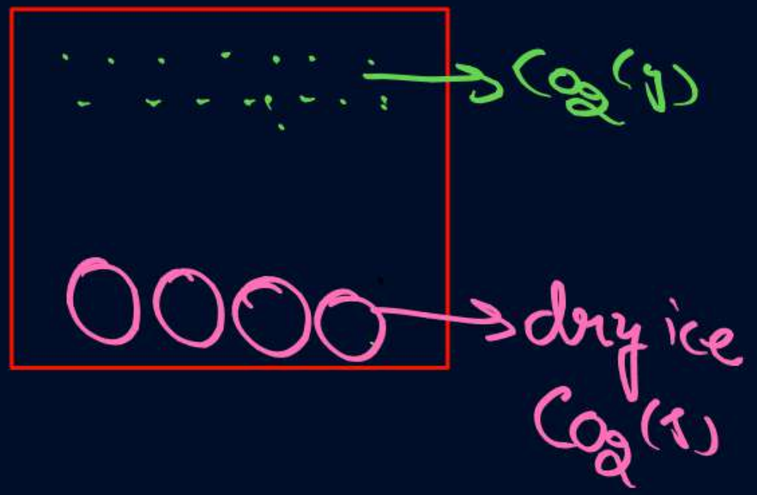
Sublime solids → $NH_4Cl(s)$, $I_2(s)$

Camphor(s), Napthalene (s)) $(O_2(s)$ dry ice

Sublimation

$I_2(s) \rightleftharpoons I_2(g)$

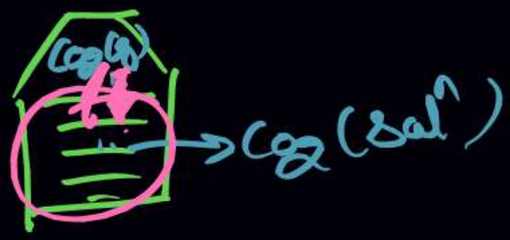
deposition



rate of sublimation = rate of deposition

Gas - soln eq :-

$$CO_2(g) \rightleftharpoons CO_2(soln)$$



Soda bottle open $\Rightarrow$ $CO_2(g)$ comes out · due to loss in pressure

Chemical Equilibrium

$$aA(g) + bB(g) \underset{\text{backward rxn}}{\overset{\text{forward rxn}}{\rightleftharpoons}} cC(g) + dD(g)$$

as $t \uparrow$ rate of forward rxn $\downarrow$ rate of backward rxn $\uparrow$

at eq.

rate of forward rxn = rate of backward rxn.

Characteristics of Equilibrium

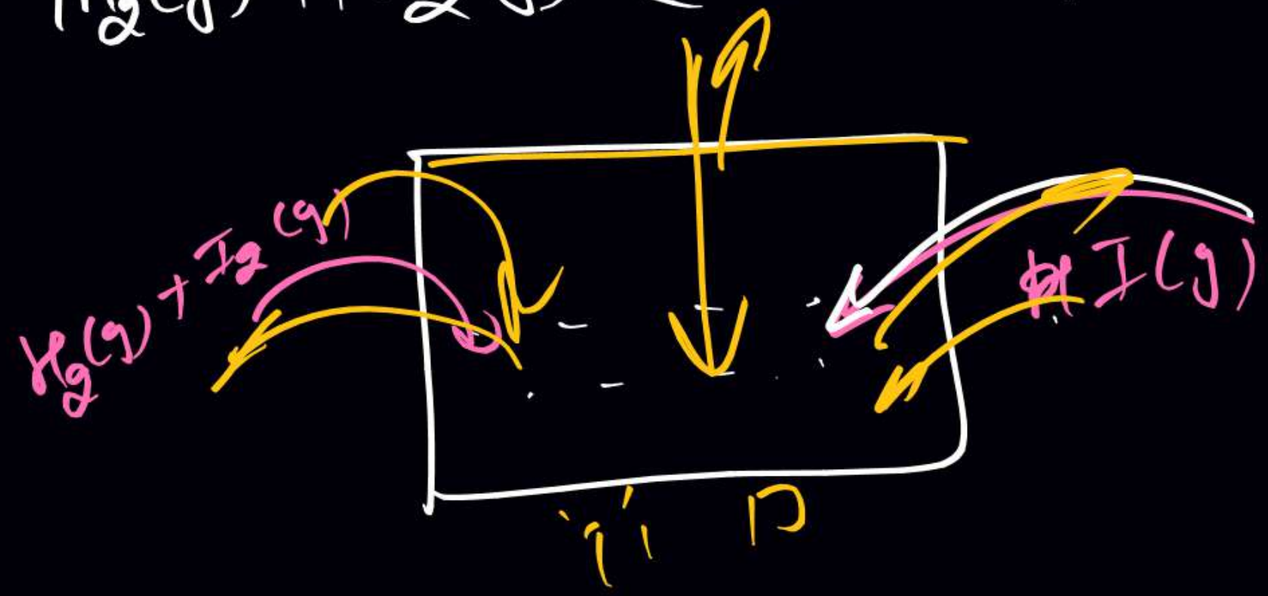
t = 3hr.
t = 1hr.

R → P
5M 1M
5M 1M

#MIT

1. at eq. all observable prop. b'com constant for ex ÷ P, V, T, n etc.
2. Catalyst has no effect on eq.
3. eq. is dynamic & not static.
4. at eq. $\Delta G_r = 0$
5. eq. Can be achieved from either side.
6. If at eq. any observable prop. is changed eq. is disturbed.

$$1H_2(g) + 1I_2(g) \rightleftharpoons 2HI(g)$$



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