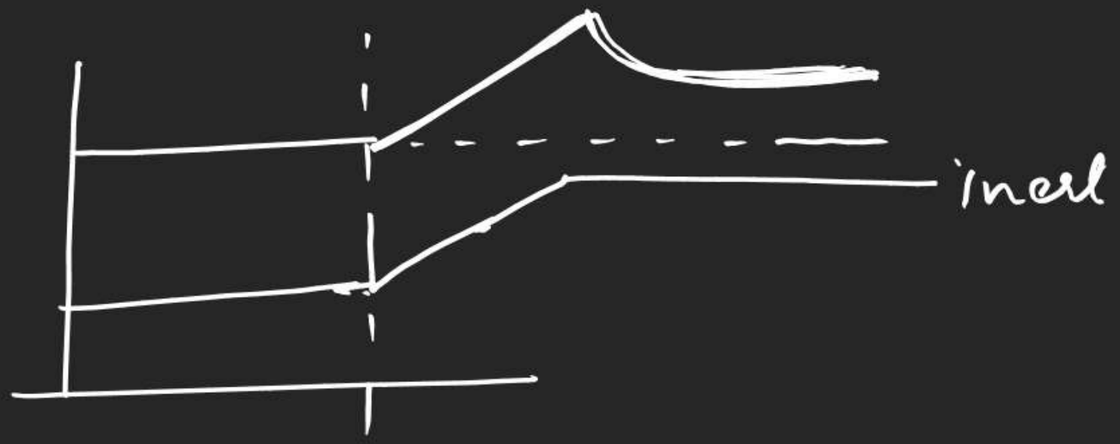
78



79

$SO_2Cl_2 \rightarrow SO_2 + Cl_2$

0.1 0.1

1

2

2+x

$K_p = 10^{-2}$

0.2 0.2

0.2-x 0.2-x

$$\frac{(0.2-x)^2}{2+x} = 10^{-2}$$

0.01

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S-I 42, 43, 44

(43)

$NH_4HS(s) \rightarrow NH_3 + H_2S$ $\quad K_{c_1} = 0.5 \times 1$

2 mol − 1 $\quad 1 - 0.5 = 0.5 \quad 1$

$NH_3(g) \rightarrow \frac{1}{2}N_2 + \frac{3}{2}H_2$ $\quad K_{c_2} = \dfrac{(0.25)^{1/2}(0.75)^{3/2}}{0.5}$

$1 - 0.5 = 0.5 \quad 0.25 \quad 0.75$

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(44)

$2NO_2 \longrightarrow N_2O_4$

$2p - x - y \qquad x/2$

$NO + NO_2 \longrightarrow N_2O_3$

$p - y \qquad 2p - x - y \qquad y$

$K_p = 6.8 \text{ atm}^{-1}$

$K_p = ?$

$x/2 = 1.7$ — (1)

$x = 3.4$

$P_{NO_2} + P_{N_2O_4} + P_{NO} + P_{N_2O_3} = 5.05$

$2p - x - y + x/2 + p - y + y = 5.05$

$3p - x/2 - y = 5.05$ — (2)

$6.8 = \dfrac{1.7}{(2p - x - y)^2}$

$2p - x - y = \frac{1}{2} = 0.5$ — (3)

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(2) $Q = \frac{[NO_2]^2}{[N_2O_4]} = \frac{(0.1)^2}{(0.1)} = 0.1 < K_c$

(3)

N_2O_4	NO_2	$NaNO_3$	$NaNO_2$
3	3	1	1
$2-x$	$2-x$	$2+x$	$2+x$

$$\frac{(2+x)^2}{(2-x)^2} = \frac{1}{9}$$

$$\frac{2+x}{2-x} = \frac{1}{3}$$

$$6 + 3x = 2 - x$$

$$4x = -4$$

$$x = 1$$

(A) F

(B) T

(C) T

(D) F

$NaNO_3(s)$

$NaNO_2(s)$

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(9) $PCl_5 \rightarrow PCl_3 + Cl_2$

(Ni) $CO + Cl_2 \rightarrow COCl_2$ (backward)

(10) $A \rightarrow B \quad \frac{1}{0.24}$

$[C] > [B] > [A]$

$B \rightarrow C \quad K_2 = 0.4$

$C \rightarrow A \quad K_3 = 0.6$

$B \rightarrow A \quad K_2K_3 = 0.24$

$\frac{[C]}{[B]} = 0.4$

$\frac{[B]}{[A]} = \frac{1}{0.24}$

$K_3 = \frac{[A]}{[C]}$

$[A] + [B] + [C] = 1$

$A \rightarrow B$		
$1-x$	$x-y$	

$B \rightarrow C$	
$x-y$	y

$[A] + [B] + [C] = 1$

$K_2[C] + \frac{K_2}{[C]} + [C] = 1$

$[C] = \frac{1}{0.6 + \frac{1}{0.4} + 1}$

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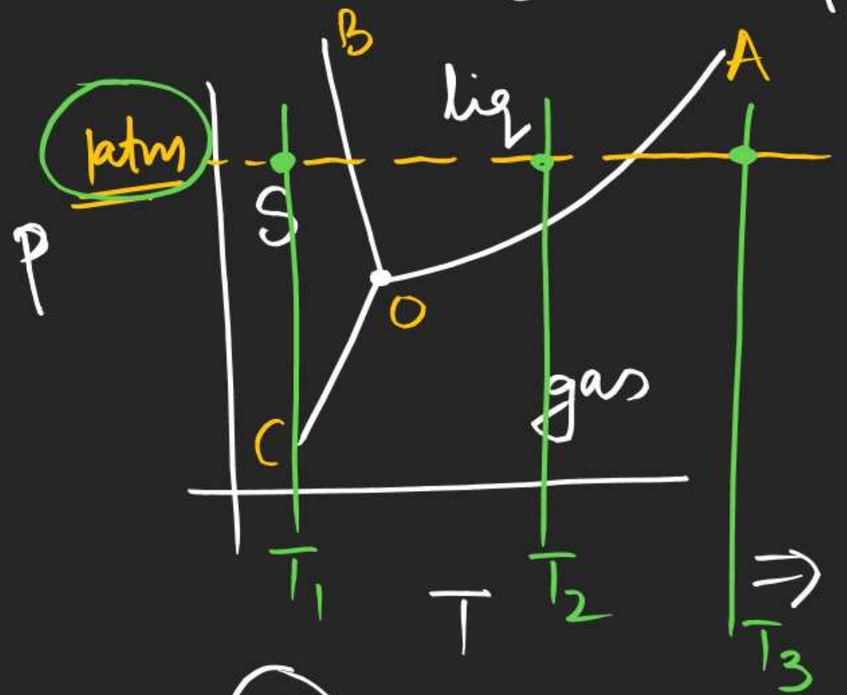
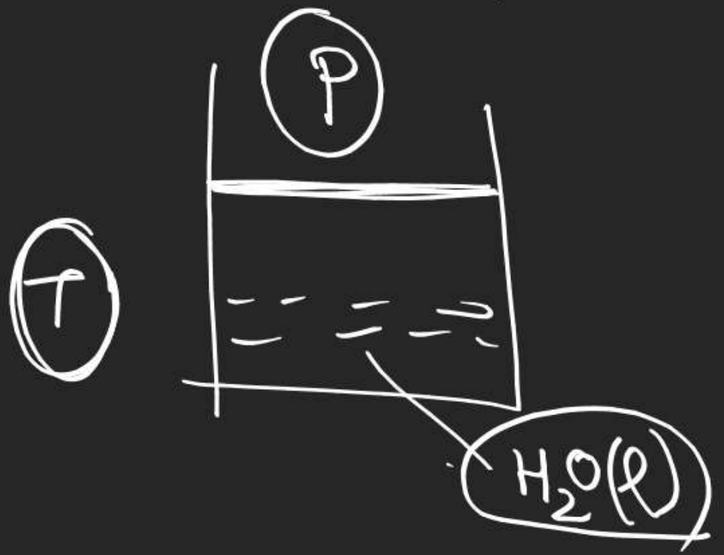
Phase diagram of H_2O





Boiling point → Temperature at which liq & gas exist simultaneously

or

Temperature at which vapour pressure equals to the external pressure.

A phase diagram tells us about the physical state of a substance at a given temperature & pressure.

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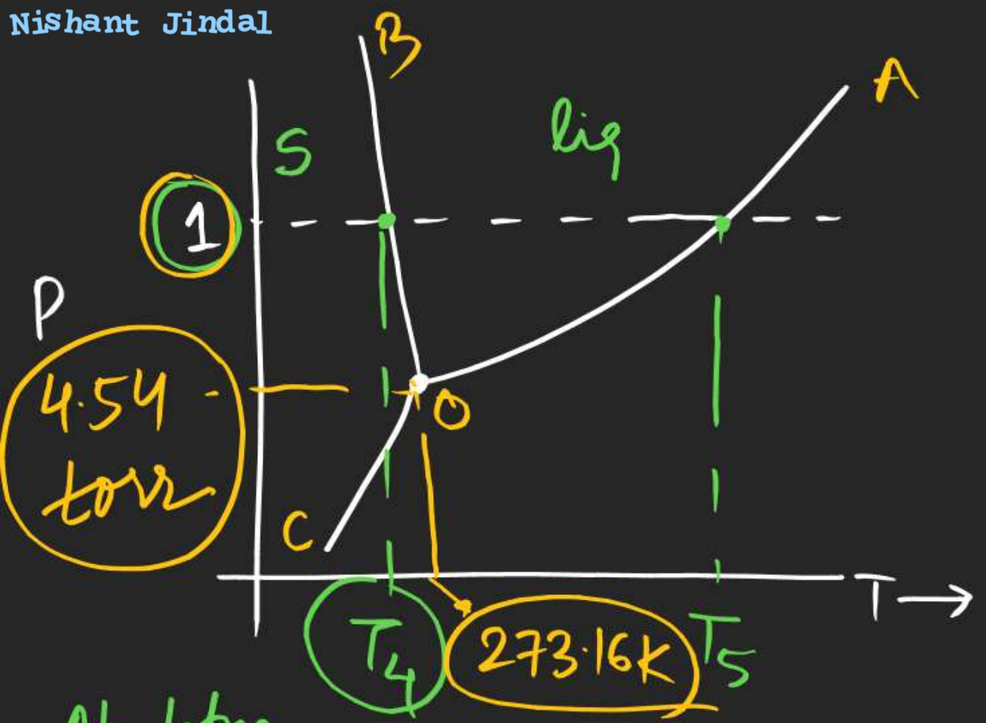

OA: Tells us about the variation of b.pt with P

OB: variation of mpt with P

OC: " Sublimation point

Point 'O' = Triple point

4.54 torr & 273.16 K

At 1atm

T_4 = Solid & liq → melting point

T_5 = liq & gas → boiling point

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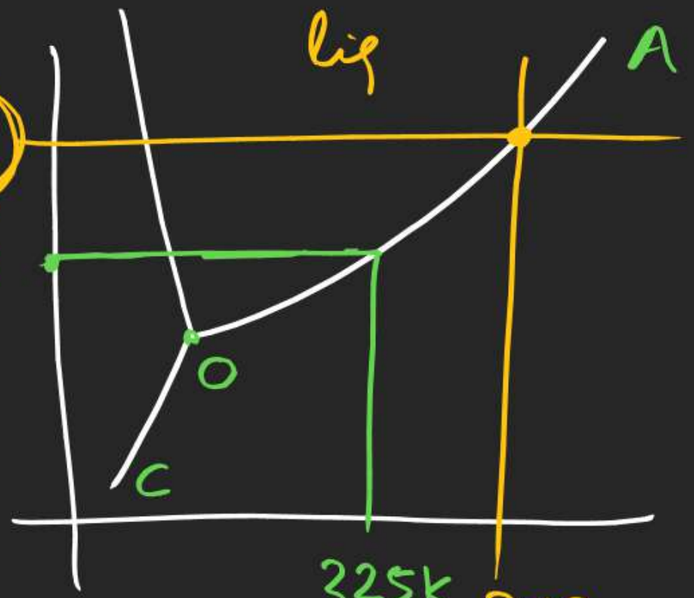

JM

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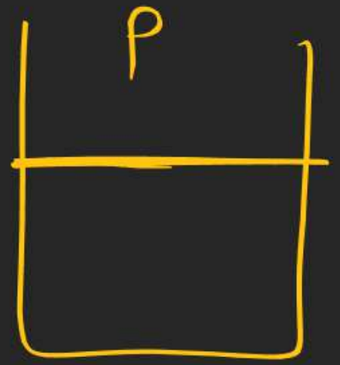
$P = P_{ext}$

373 = B.pt vap pr = 1 atm = P_{ext}



at (325K vap pr = 0.5 atm)

'OA' curve also tell us about variation of vapour pressure of liq with temp

'OC' → vap pr of solid with temp

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