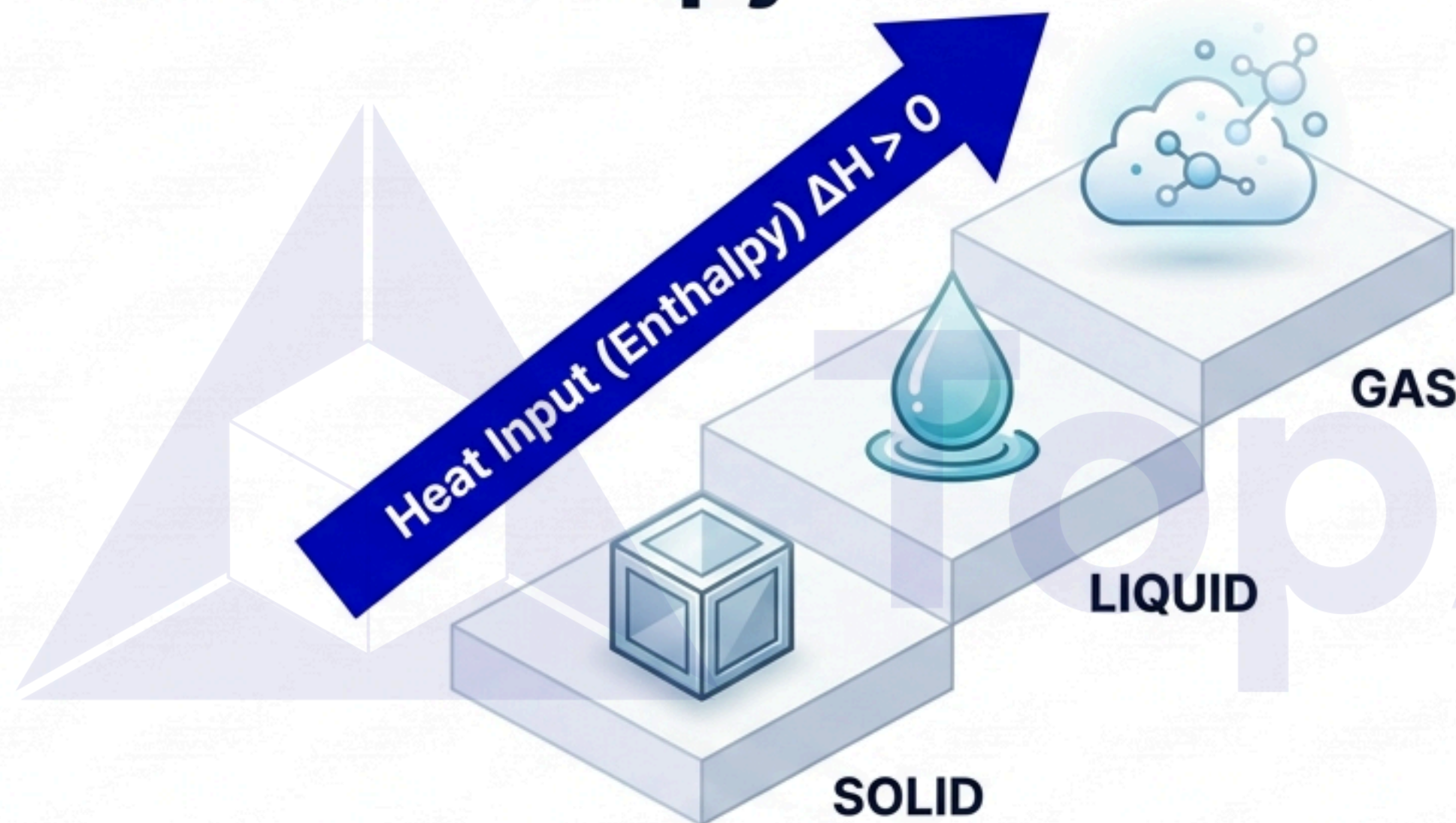


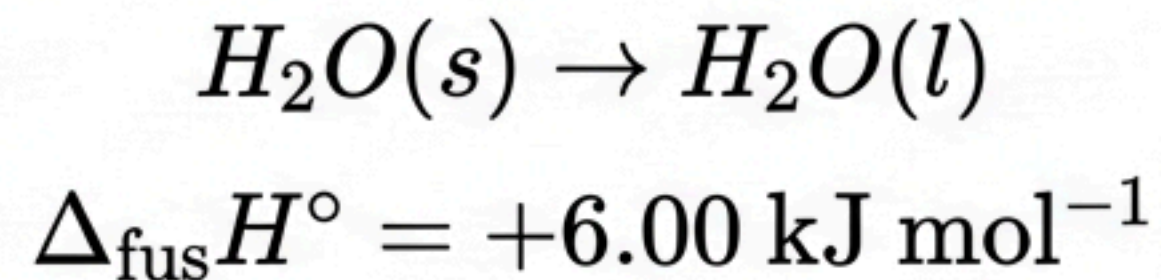
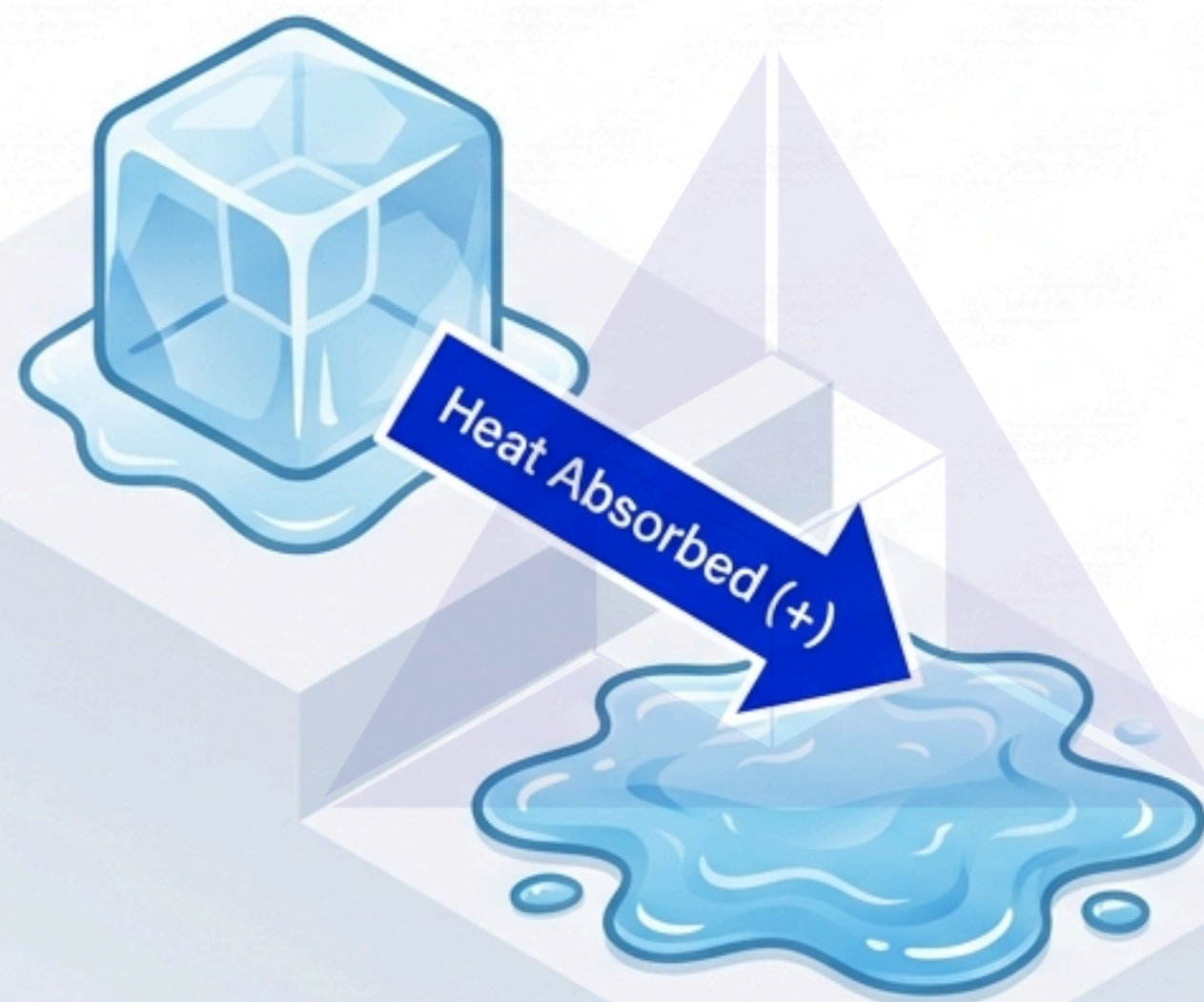
Fusion, Vaporisation & Sublimation Enthalpy



Phase Transformation Enthalpies ($\Delta_{\text{trs}}H^\circ$)

The enthalpy change when a substance transforms from one phase to another at a constant temperature and standard pressure (1 bar).

Standard Enthalpy of Fusion ($\Delta_{\text{fus}}H^\circ$)



What is Fusion?

The enthalpy change that accompanies the melting of exactly one mole of a solid substance in its standard state.

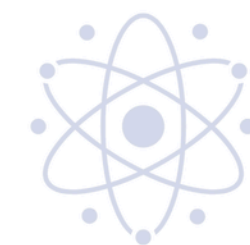


Melting requires breaking solid lattice structures. It is always endothermic ($\Delta H^\circ > 0$).



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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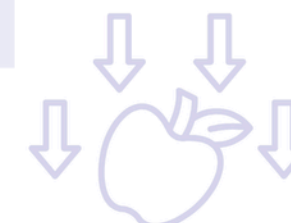
Practice Now



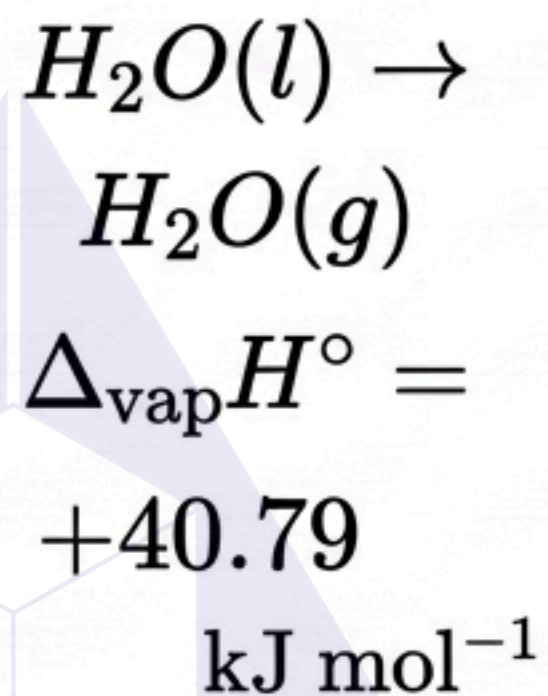
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Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Standard Enthalpy of Vaporisation ($\Delta_{\text{vap}}H^\circ$)



Light-grey Information Card

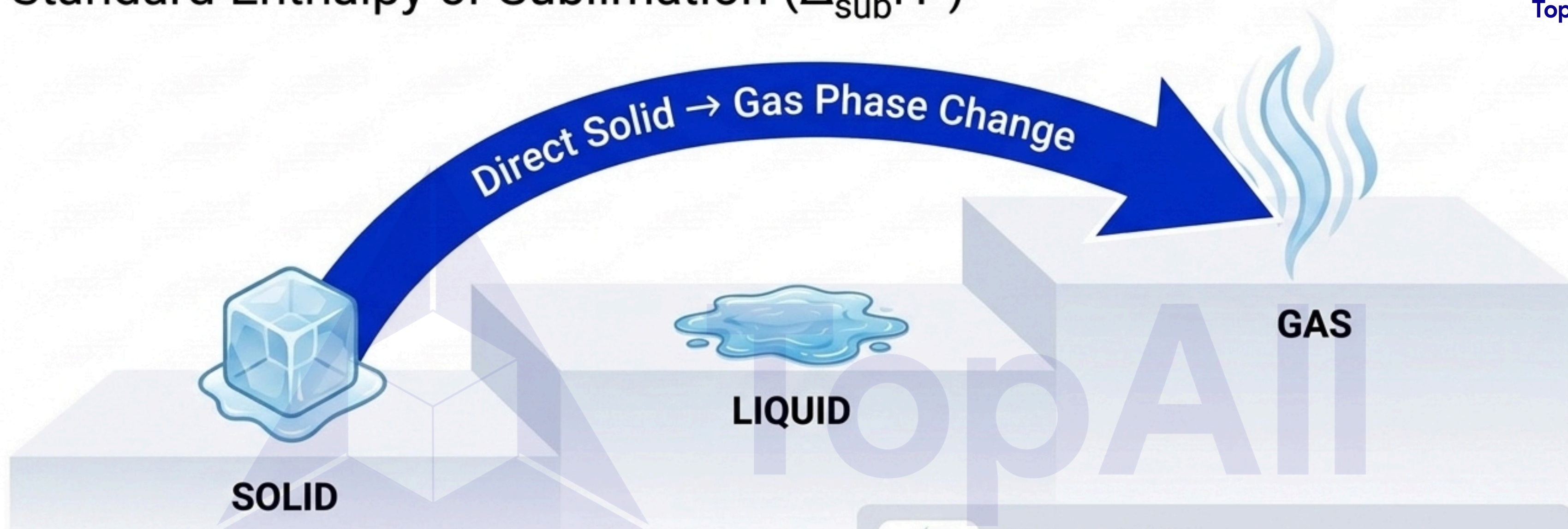
Amount of heat required to vaporise one mole of a liquid at its constant boiling point and standard pressure (1 bar).

JEE Application: Intermolecular Forces

$\Delta_{\text{vap}}H^\circ$ strictly depends on the strength of intermolecular interactions.

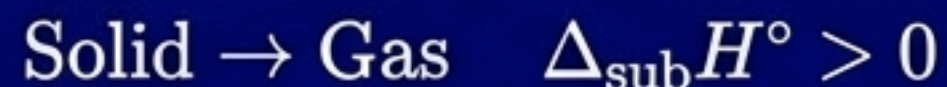
H_2O :	Strong H-bonds $\rightarrow$	High heat required $\rightarrow$ (+40.79 kJ/mol).
Acetone	Weaker dipole-dipole forces $\rightarrow$	$\rightarrow$ Less heat required.

Standard Enthalpy of Sublimation ($\Delta_{\text{sub}}H^\circ$)



Concept Card

Change in enthalpy when one mole of a solid substance sublimes directly into gas at a constant temperature and standard pressure (1 bar).



Dry Ice (CO_2)

$$\Delta_{\text{sub}}H^\circ = +25.2 \text{ kJ mol}^{-1} \text{ at } 195\text{K}.$$



Naphthalene

$$\Delta_{\text{sub}}H^\circ = +73.0 \text{ kJ mol}^{-1}.$$

Reverse Processes: The Mirror Effect

Up the Stairs (Forward)



1. Melting ($s \rightarrow l$)

$$\Delta_{fus}H^{\circ} > 0$$



2. Vaporisation ($l \rightarrow g$)

$$\Delta_{vap}H^{\circ} > 0$$

Down the Stairs (Reverse)



1. Freezing ($l \rightarrow s$)

$$\Delta_{freezing}H^{\circ} < 0$$



2. Condensation ($g \rightarrow l$)

$$\Delta_{cond}H^{\circ} < 0$$

Watch Your Signs!



The magnitude of enthalpy remains exactly the same, but the sign flips for the reverse process.

Freezing 1 mole of water gives off heat! $\Delta H^{\circ} = -6.00 \text{ kJ mol}^{-1}$.

Never forget the negative sign.

The 4 Rules of Phase Enthalpies

- ✓ **Phase Changes:** Involve heat transfer but zero temperature change.
- ✓ **Standard Amount:** Always defined per exactly one mole of substance.
- ✓ **Standard Conditions:** Must occur at the substance's constant transition temperature and 1 bar pressure.
- ✓ **Reversibility Rule:** Reversing the process keeps the exact same magnitude, but requires a reverse sign ($\pm$).



You've Learned the Theory.

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