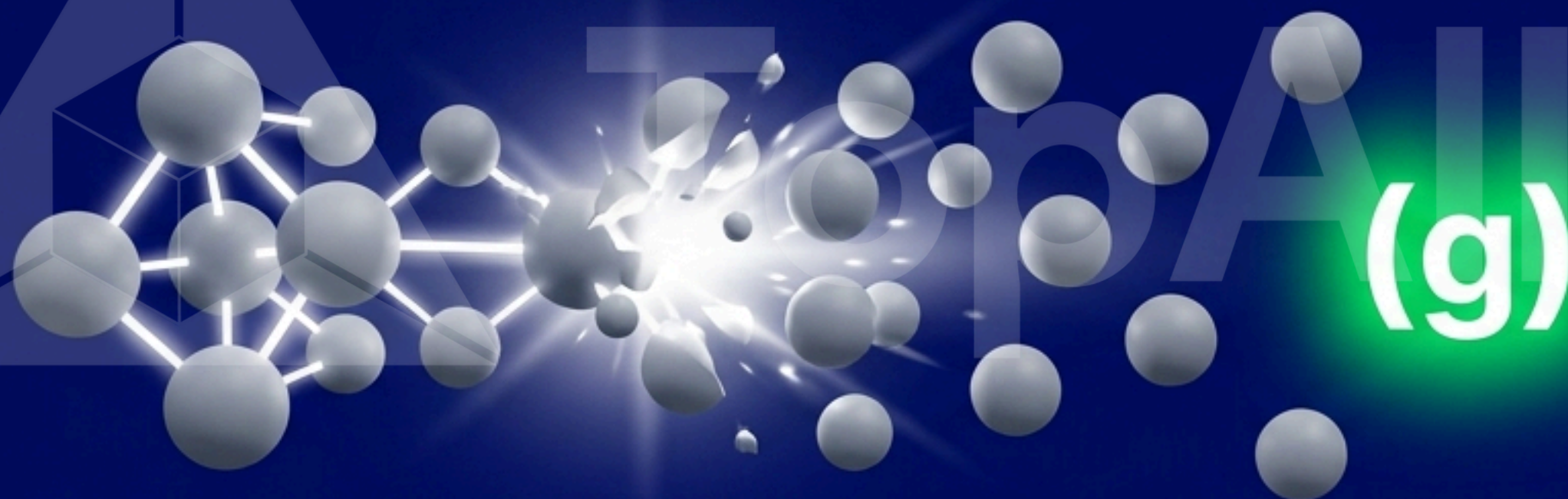


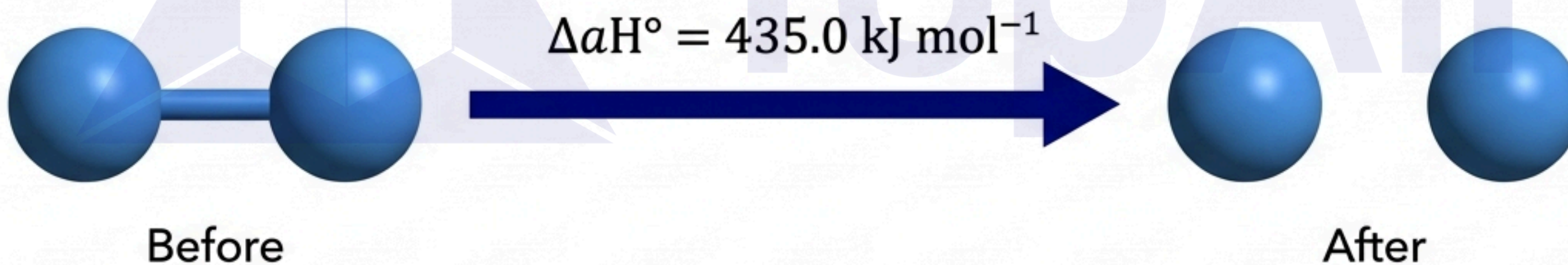
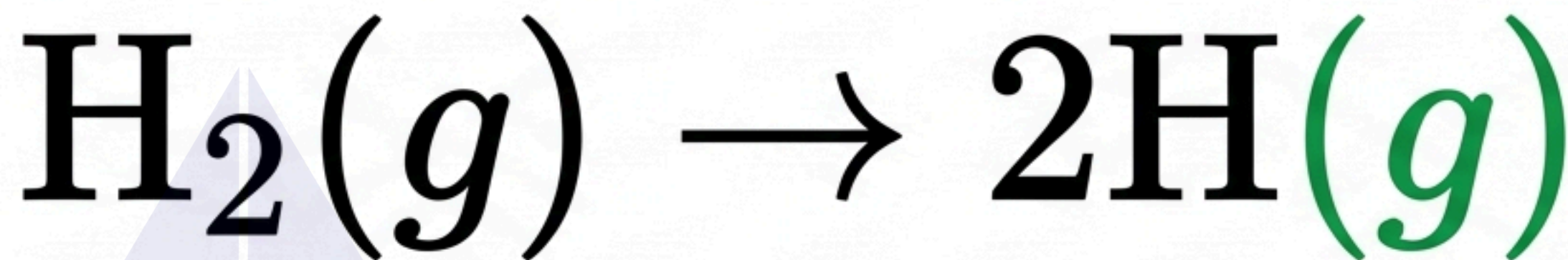
Enthalpy of Atomization | $\Delta_a H^\circ$

**ATOMIZATION MUST END
IN GASEOUS ATOMS**



Molecular Disassembly Line

The Simplest Case: Diatomic Molecules



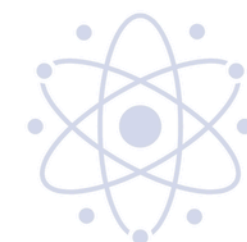
For diatomic molecules, breaking the molecule into atoms is exactly the same as breaking its single bond.

Enthalpy of Atomization = Bond Dissociation Enthalpy ($\Delta_a H^\circ = \Delta_{\text{bond}} H^\circ$)



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

$$E=mc^2$$



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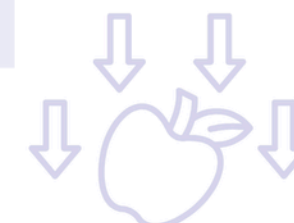
Practice Now



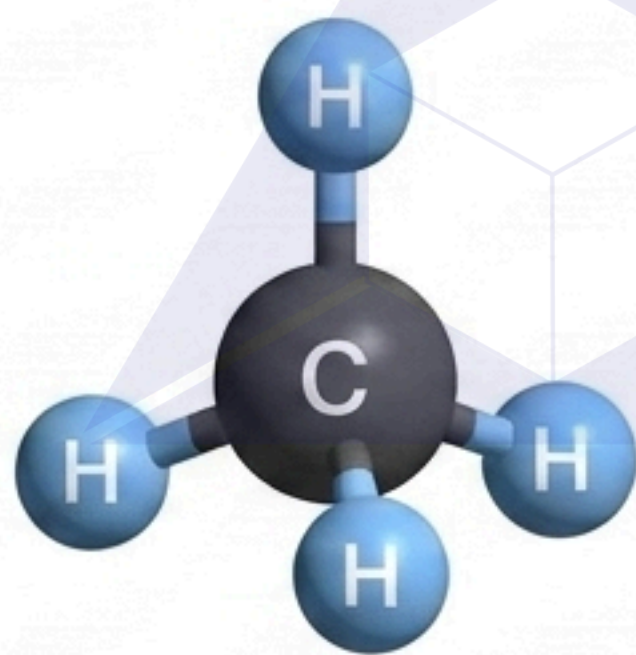
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- » Get Clear Explanations, Not Just Marks
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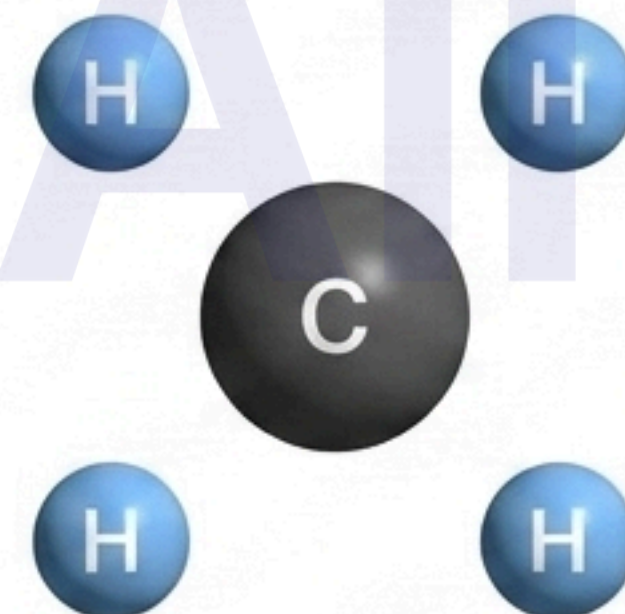


Scaling Complexity: Polyatomic Molecules



Before

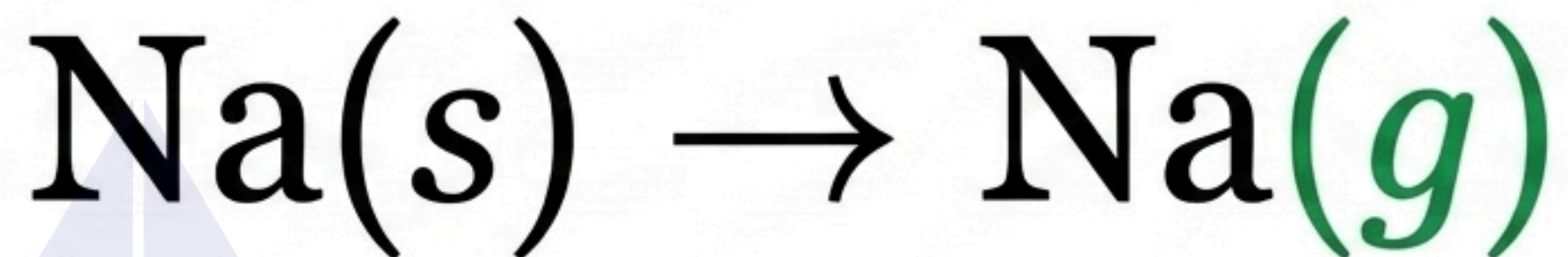
$$\Delta aH^\circ = 1665 \text{ kJ mol}^{-1}$$



After

Atomization is the complete annihilation of the molecule. Every single bond must be broken.

The Edge Case: Solid Metals



Before

$$\Delta_a H^\circ = 108.4 \text{ kJ mol}^{-1}$$

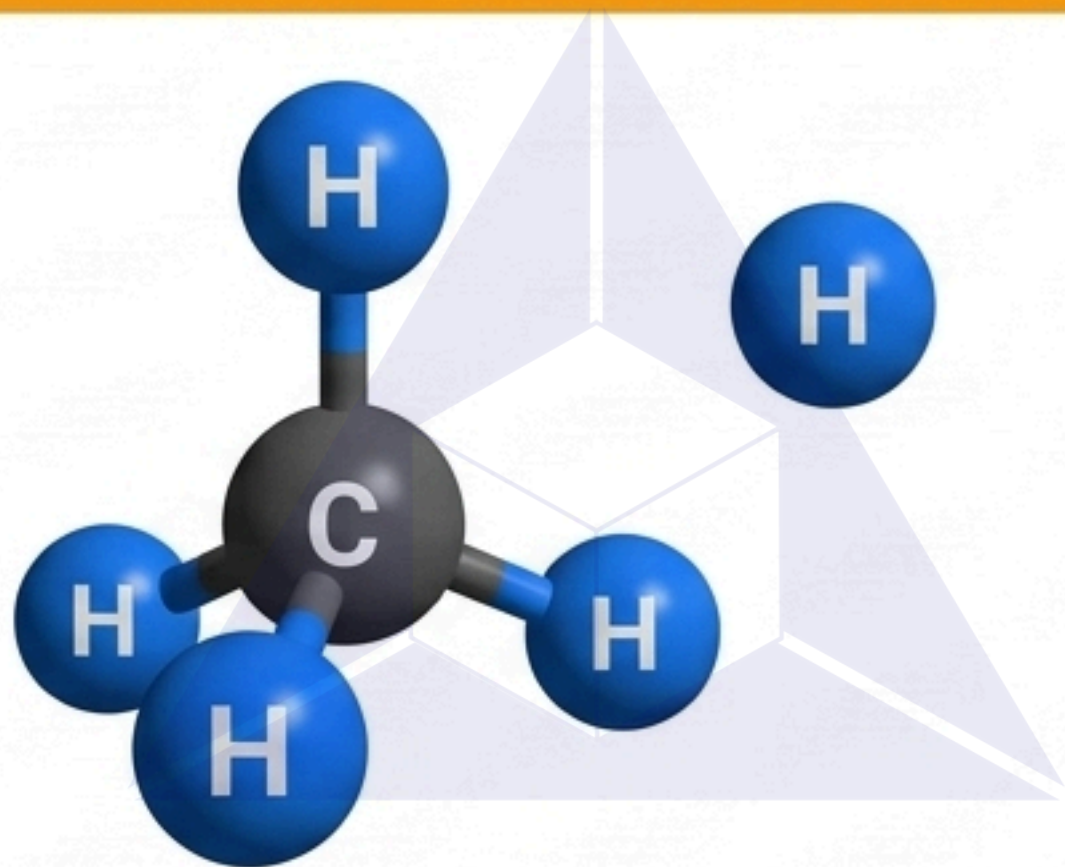


After

Metals do not form discrete molecules. Breaking a metal lattice completely into gaseous atoms is sublimation.

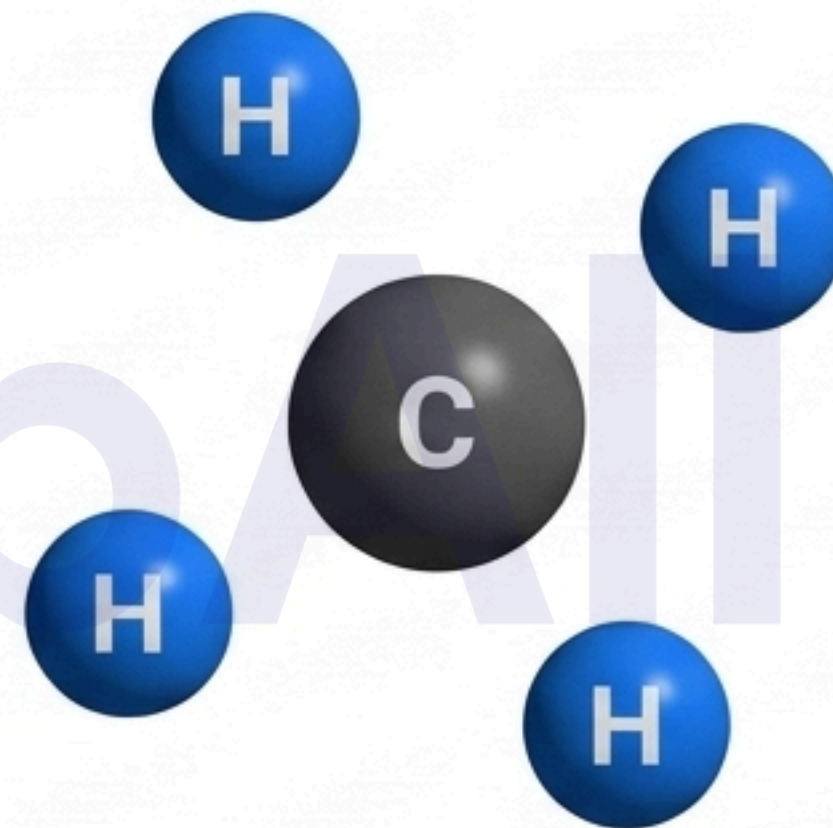
Enthalpy of Atomization = Enthalpy of Sublimation ($\Delta_a H^\circ = \Delta_{\text{sub}} H^\circ$)

JEE Trap Alert: Stepwise vs. Complete



✗ Not complete atomization.

Molecule (CH_3) is still present in the product.

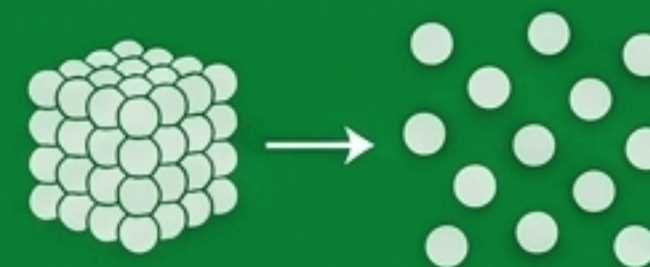


✓ Correct $\Delta_a H^\circ$.

Products are exclusively isolated gaseous atoms.

Key Takeaways: $\Delta_a H^\circ$

- **Definition:** Energy required to break 1 mole of substance completely into isolated atoms.
- **The Golden Rule:** ALL products MUST be in the gaseous (g) state.
- **Diatomic Overlap:** For H_2 , Cl_2 , O_2 , $\Delta_a H^\circ$ = Bond Dissociation Enthalpy.
- **Metal Overlap:** For solid metals (Na, Fe), $\Delta_a H^\circ$ = Enthalpy of Sublimation.





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