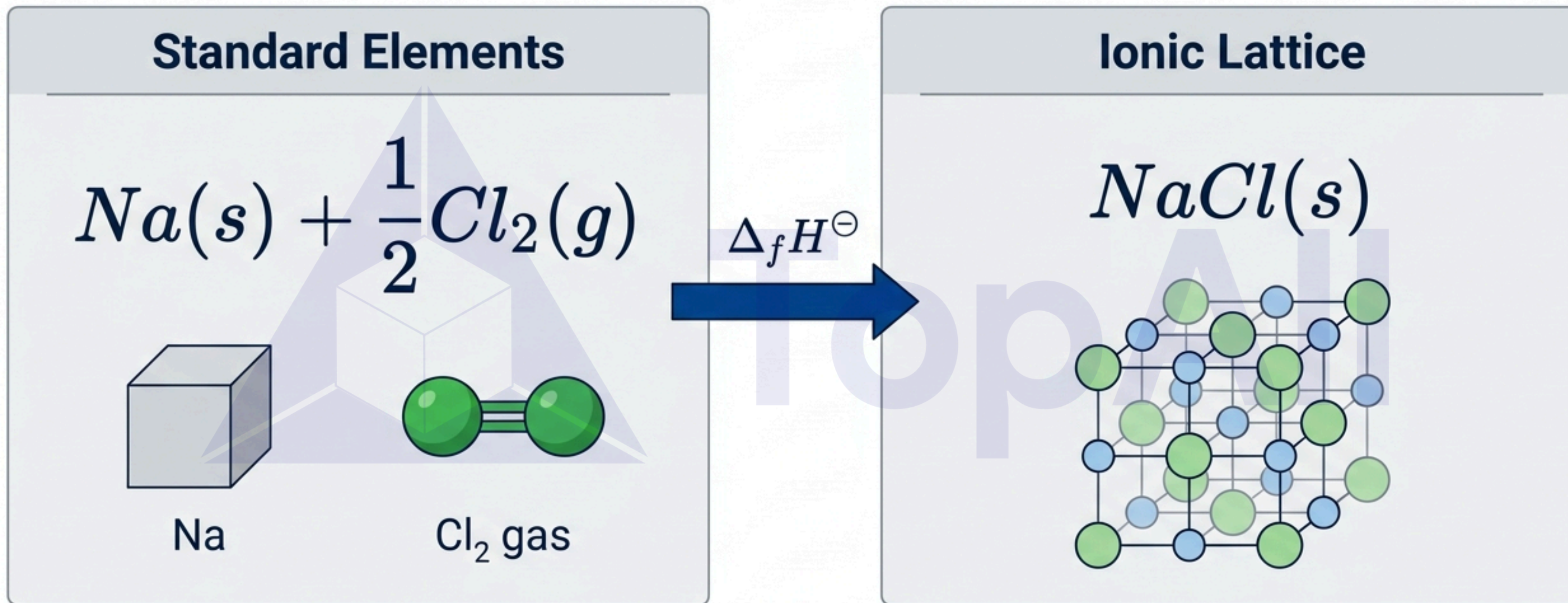


How to Solve a Born–Haber Cycle | JEE Application

**DON'T MEMORISE A GIANT
FORMULA — BUILD THE CYCLE**



The Goal: Formation of an Ionic Solid



To apply Hess's Law, we must convert these standard elements into **gaseous ions** (intermediate species) before they can form the lattice.



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

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

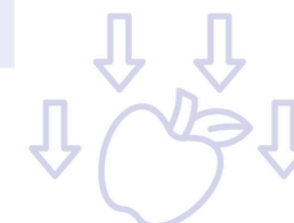
Practice Now



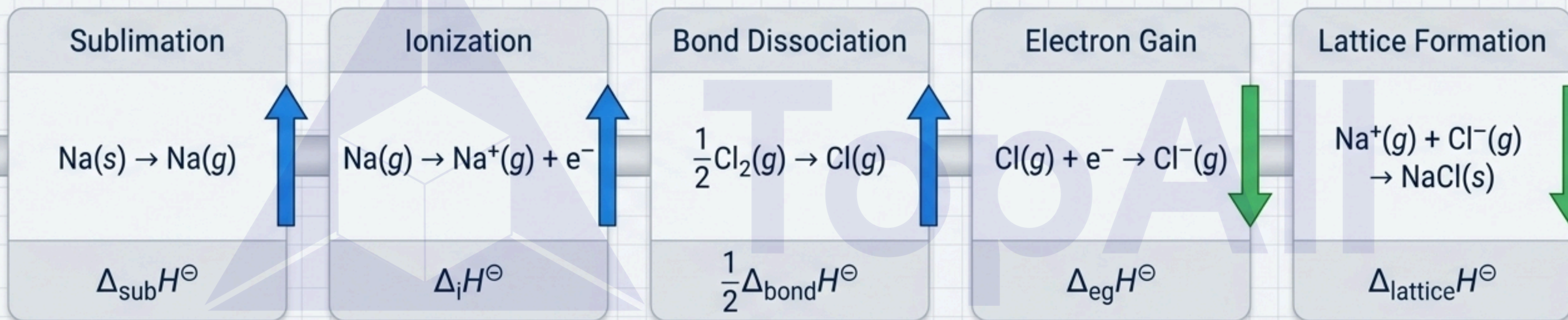
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Key Highlights

- » 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

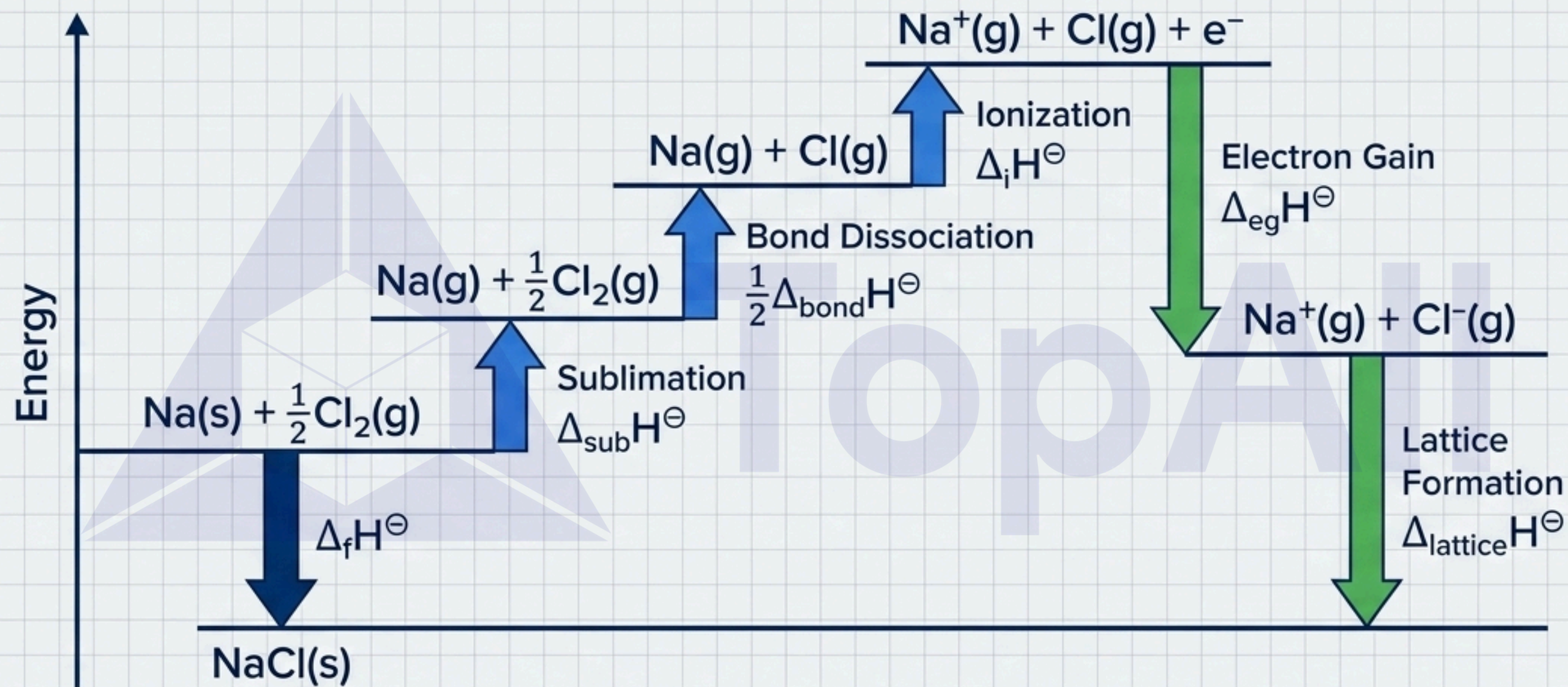


The 5 Energy Steps to Build the Cycle



 Energy Absorbed (Endo)
 Energy Released (Exo)

Hess's Law: Assembling the Cycle



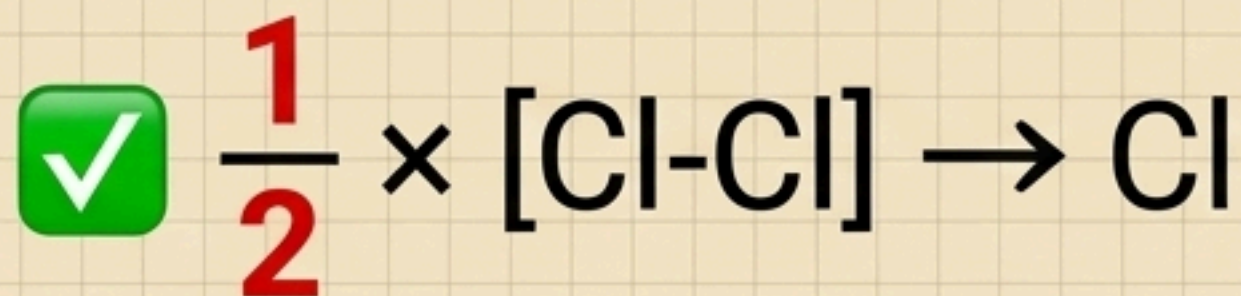
$$\Delta_{\text{f}}\text{H}^\ominus = \Delta_{\text{sub}}\text{H}^\ominus + \frac{1}{2}\Delta_{\text{bond}}\text{H}^\ominus + \Delta_{\text{i}}\text{H}^\ominus + \Delta_{\text{eg}}\text{H}^\ominus + \Delta_{\text{lattice}}\text{H}^\ominus$$

Common Exam Pitfalls

Why $\frac{1}{2}\text{Cl}_2$?

Students often mistakenly add the full bond dissociation energy of Cl_2 .

The target NaCl(s) only requires **one mole of Cl atoms**.



Sign Conventions

Electron Gain Enthalpy for halogens is highly negative (exothermic).

Lattice Enthalpy is often given as dissociation (positive); forming the lattice is **negative**.


 $\Delta e_g H = +348.6$


 $\Delta e_g H = -348.6$

Always track signs based on arrow direction!

Key Takeaways: How to Attack Any Question

The 5-Step Born-Haber Algorithm

- 1 Write target reaction:** Identify the Standard Enthalpy of Formation ($\Delta_f H^\ominus$).
- 2 Write gaseous atoms/ions:** Define the required intermediate gaseous species.
- 3 Connect all steps:** Draw paths for sublimation, dissociation, ionization, electron gain, and lattice formation.
- 4 Assign signs carefully:** Check for fractions (e.g., $\frac{1}{2}$) and exothermic (–) vs endothermic (+) definitions.
- 5 Apply Hess Law:** Equate the direct path ($\Delta_f H^\ominus$) to the sum of the indirect step path.



You've Learned the Theory.

Now Let's Test It.

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Jump in while the concept is still fresh in your head

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