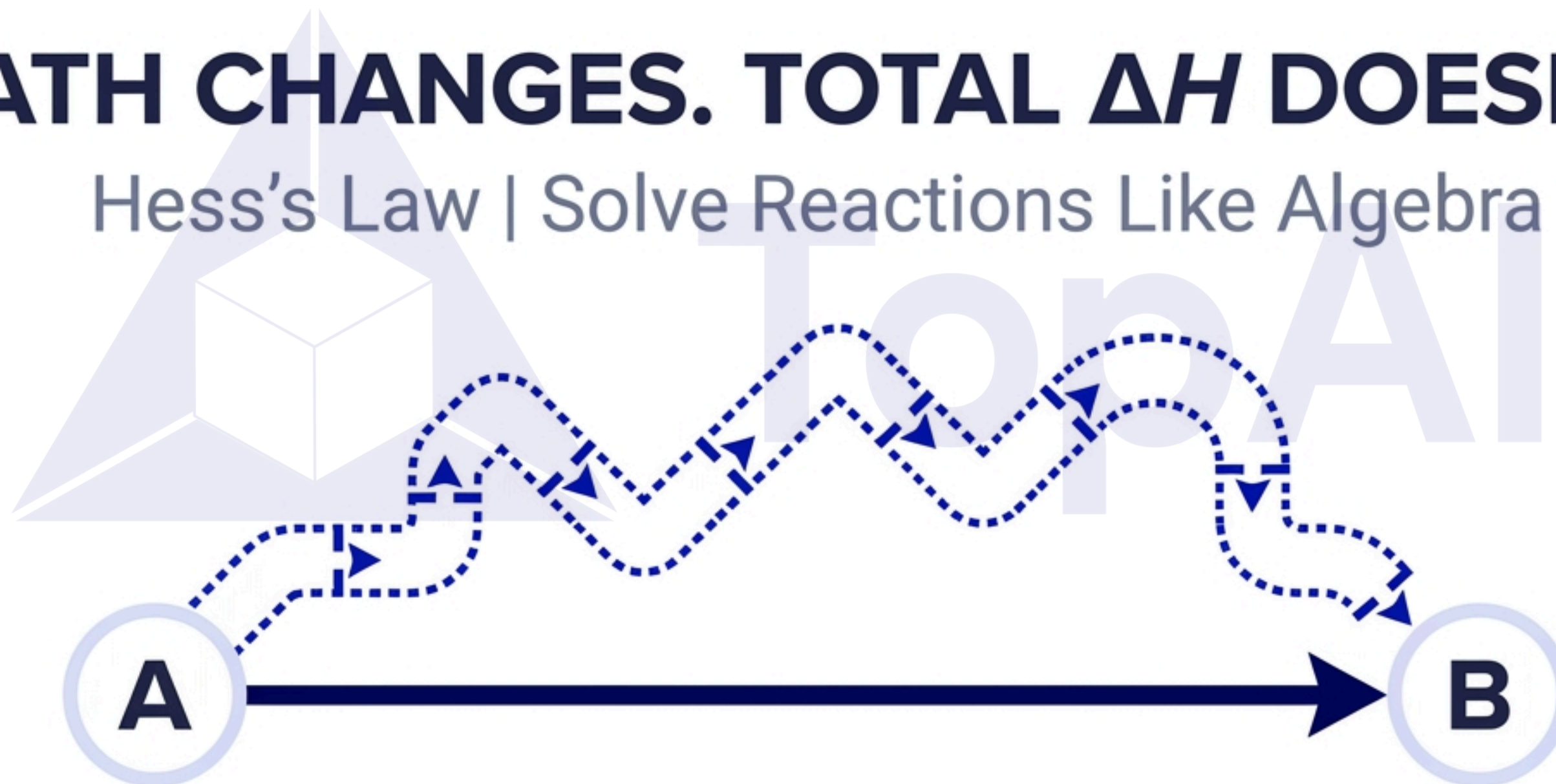


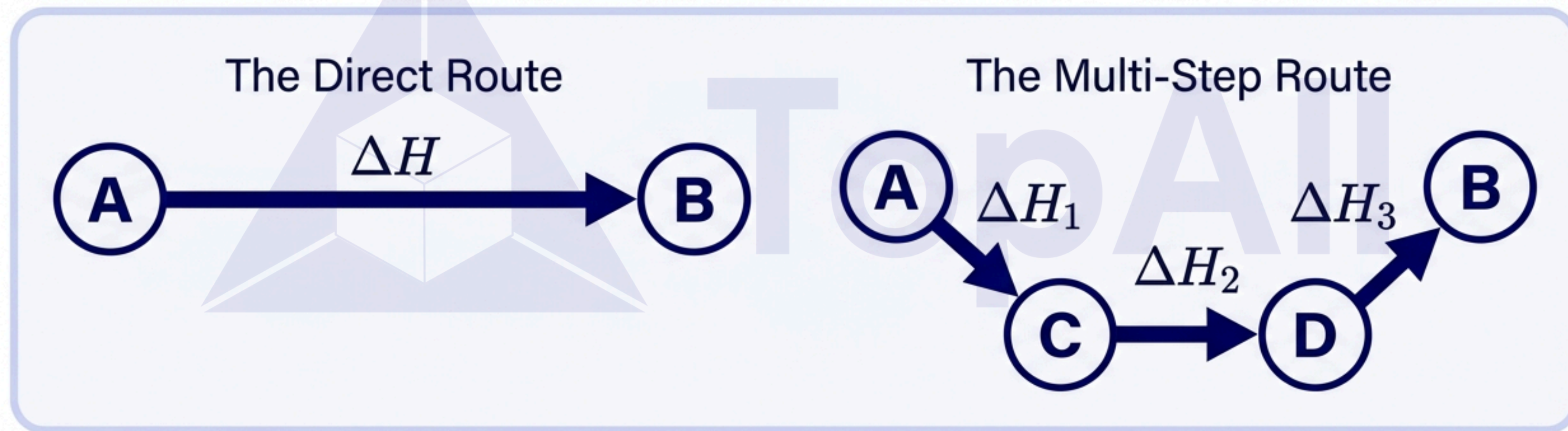
PATH CHANGES. TOTAL ΔH DOESN'T.

Hess's Law | Solve Reactions Like Algebra



Enthalpy (H) is a State Function

The universe only cares about the start and the end. Both paths yield the exact same overall ΔH .



$$\Delta H = \Delta H_1 + \Delta H_2 + \Delta H_3$$



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$$E=mc^2$$



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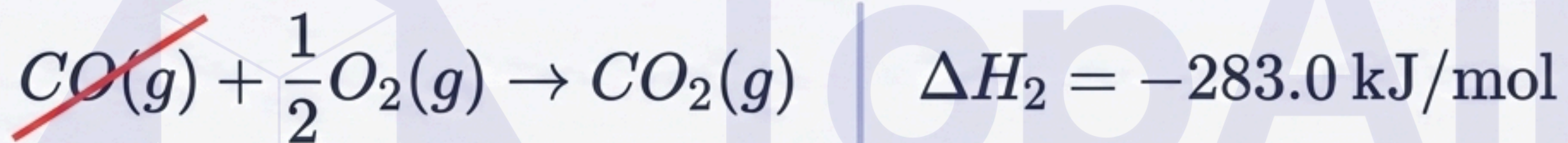
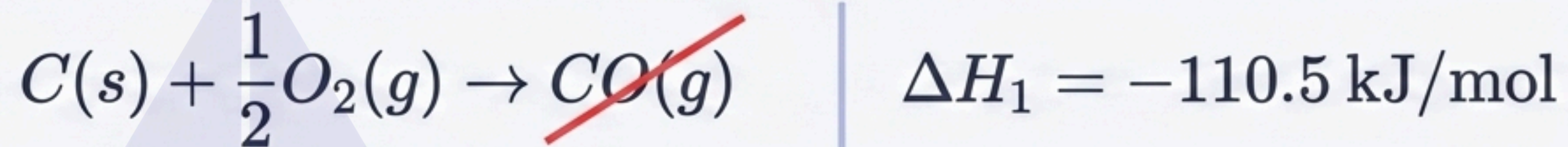


Hess's Law of Constant Heat Summation

The standard reaction enthalpy of a multi-step reaction is simply the sum of the standard enthalpies of its intermediate steps.

$$\Delta H = \Delta H_1 + \Delta H_2 + \Delta H_3 + \cdots$$

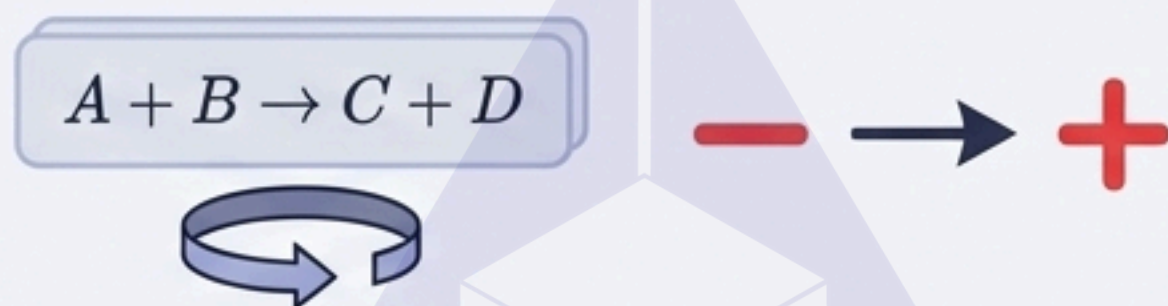
Proving the Path (Carbon Oxidation)



The 4 Algebraic Operations

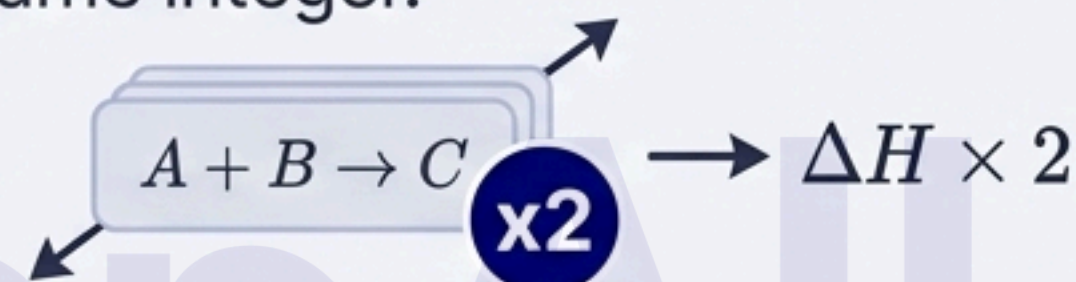
REVERSE

Reverse reaction $\rightarrow$ Reverse ΔH sign.



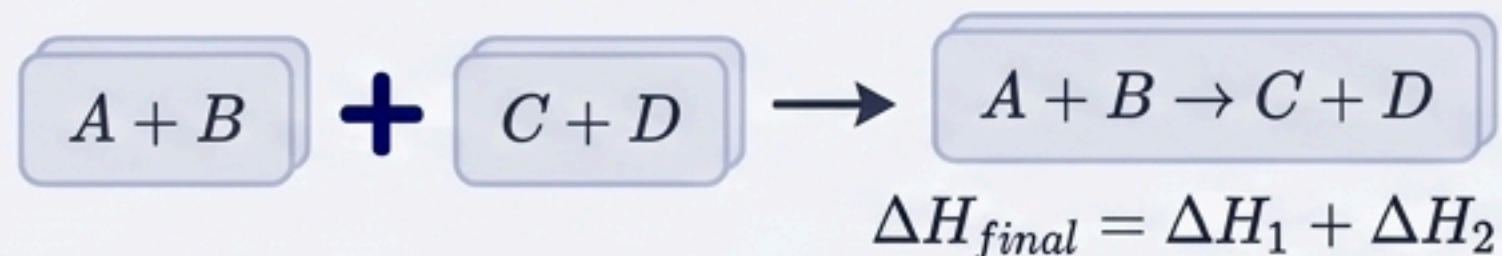
MULTIPLY

Multiply stoichiometry $\rightarrow$ Multiply ΔH by the same integer.



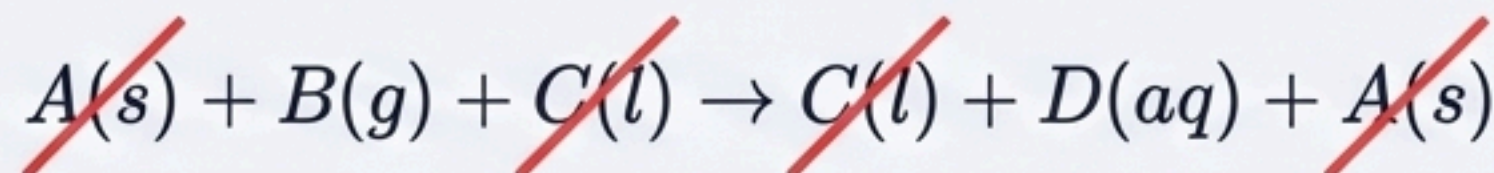
ADD

Add equations $\rightarrow$ Add ΔH values.



CANCEL

Cancel identical species on opposite sides.
Must be in the exact same physical state!



JEE Trap: Multiplying the equation's stoichiometry but forgetting to multiply the ΔH value is the #1 reason for negative marks.

Revision Summary

- ✓ Enthalpy change is strictly path-independent (State Function).
- ✓ Treat chemical equations exactly like algebraic equations.
- ✓ Always verify physical states (s, l, g) before cancelling species across steps.
- ✓ Exam Strategy: Target the final equation first, then manipulate the given steps to match the target's reactants and products.



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