

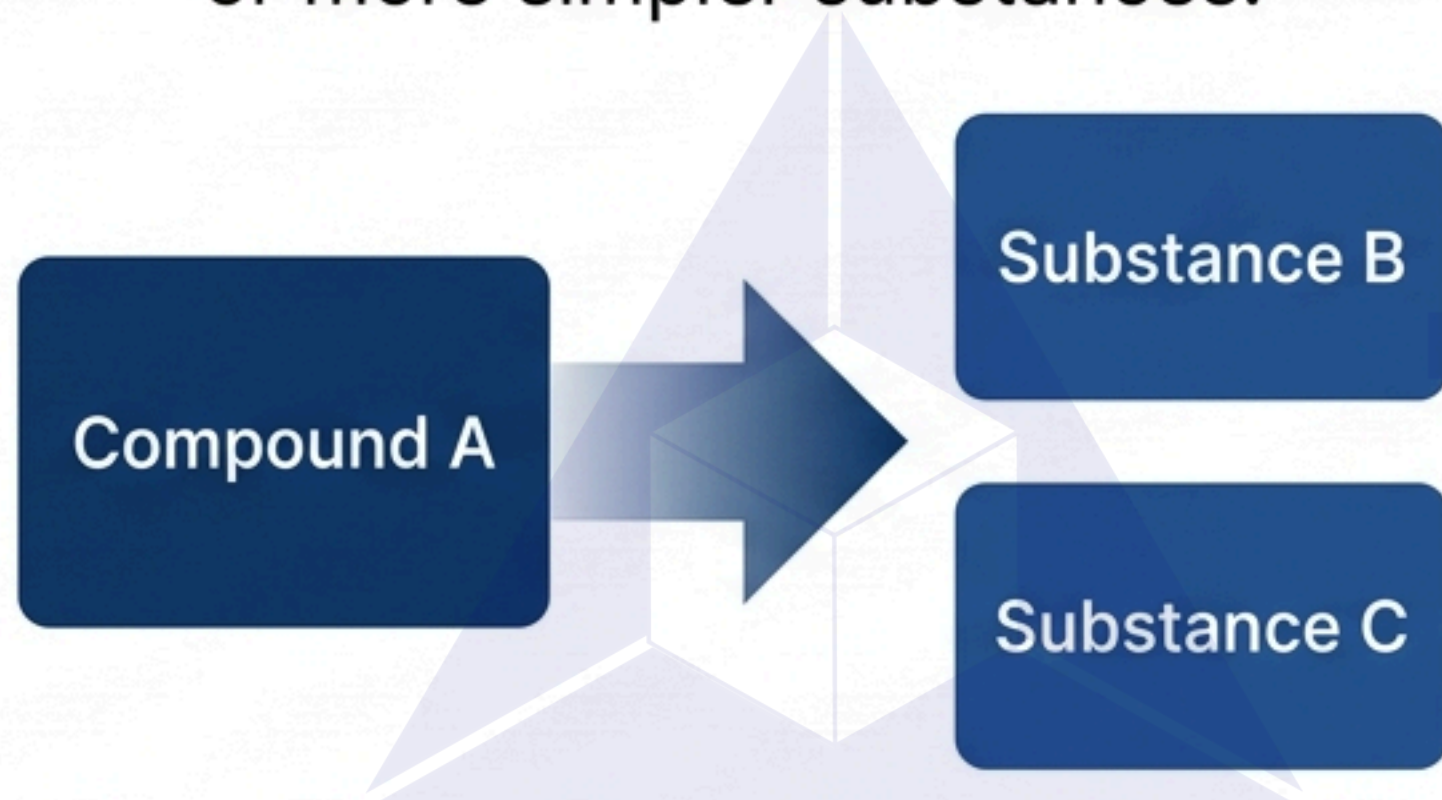
Not Every Decomposition Is Redox

Chapter 7: Redox Reactions | JEE Diagnostic Series



General Decomposition

A compound breaks down into two or more simpler substances.



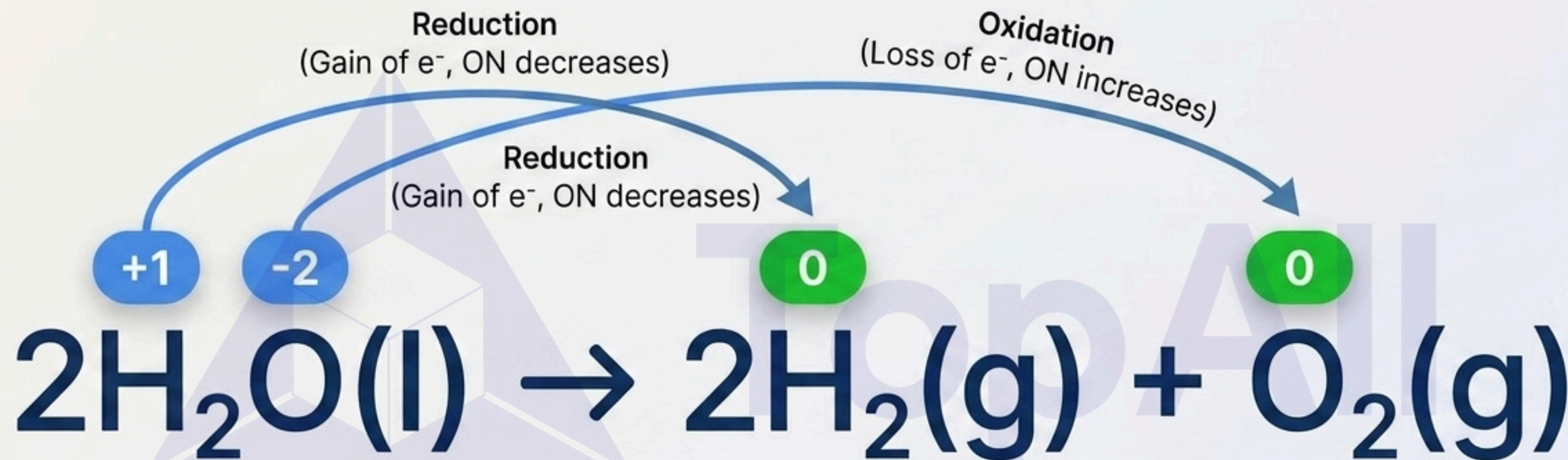
Redox Decomposition

A decomposition where electrons are transferred, changing the oxidation states of the atoms



The Golden Rule: For a decomposition to be a redox reaction, at least one product must be in the **elemental state (Oxidation State = 0)**.

The Classic: Decomposition of Water



Formula Bank: Elemental gases like H₂ and O₂ always have an oxidation state of 0.



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$$E=mc^2$$



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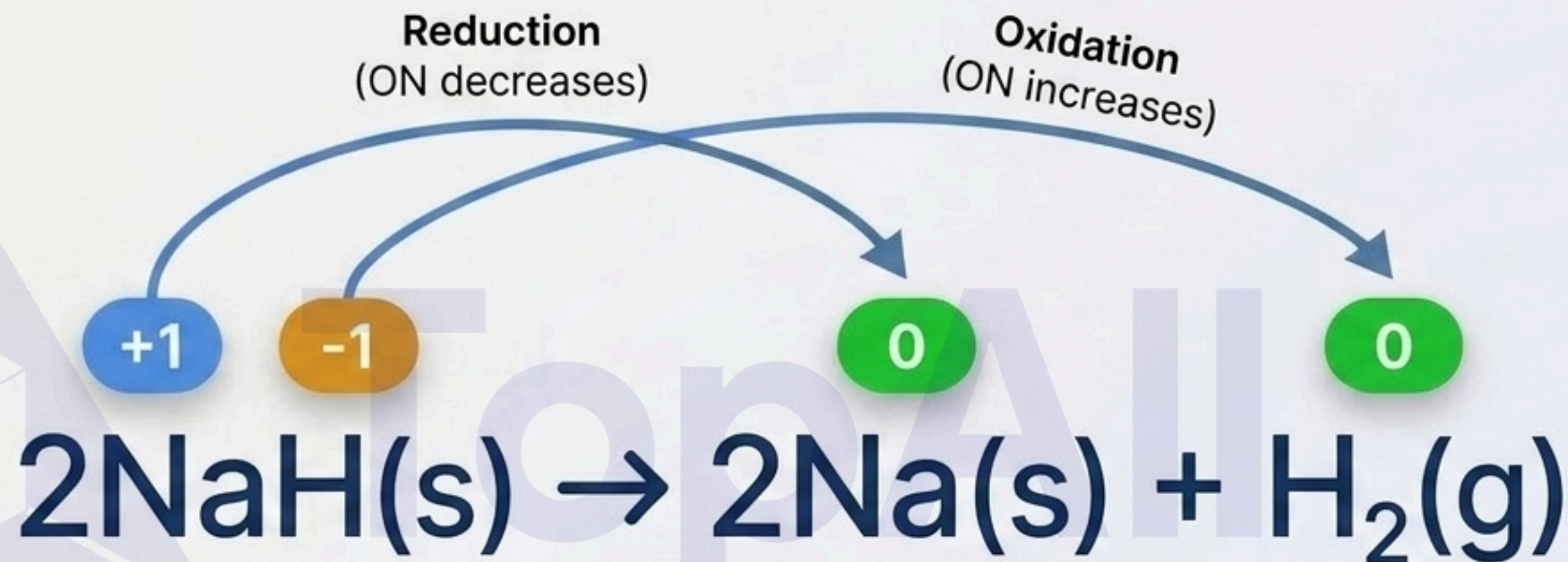


The Hydride Catch: Sodium Hydride

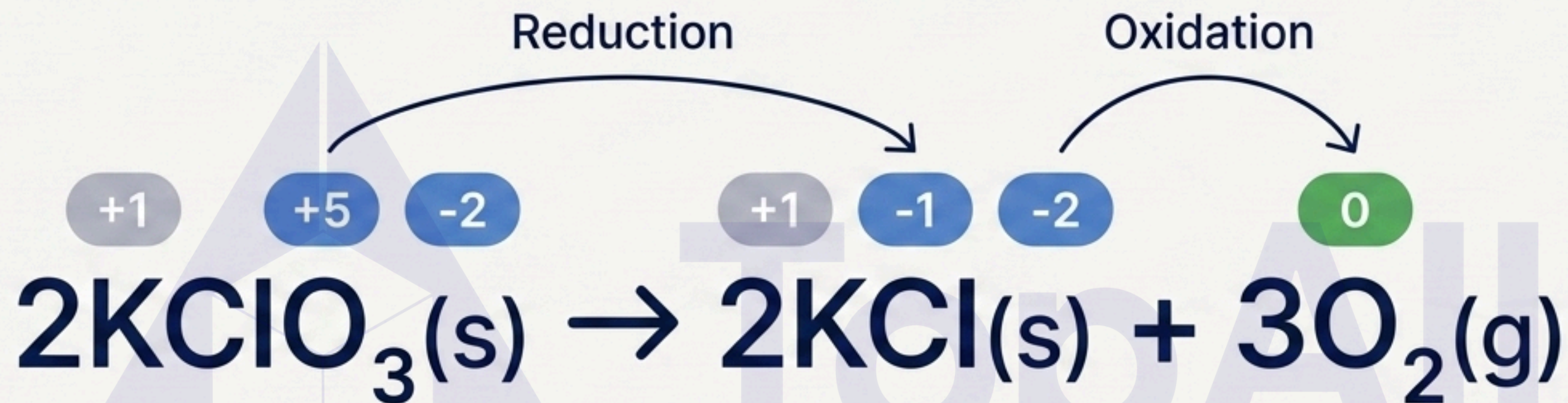
Hydride Alert!

When Hydrogen is bonded to a metal (like Na) in binary compounds, its oxidation state is -1, not its usual +1.

This is a common trap in oxidation state assignments.



The Complex Breakdown: Potassium Chlorate



Notice Potassium (K). It stays +1 on both sides.
Not every atom has to change state in a redox reaction!

The Exception: Calcium Carbonate



JEE Trap Alert!

Because NO products are in the elemental state (0), there is absolutely no electron transfer. The oxidation numbers remain identical. This is a thermal decomposition, but NOT a redox reaction.



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