

Redox Reactions: Oxidation Meets Reduction

The Classical Idea of Chemical Transformation

Why Redox Matters



Fuels

Burning hydrocarbons to obtain energy for domestic, transport, and commercial purposes.



Batteries

The chemical engine powering both dry and wet electrochemical cells.



Metallurgy

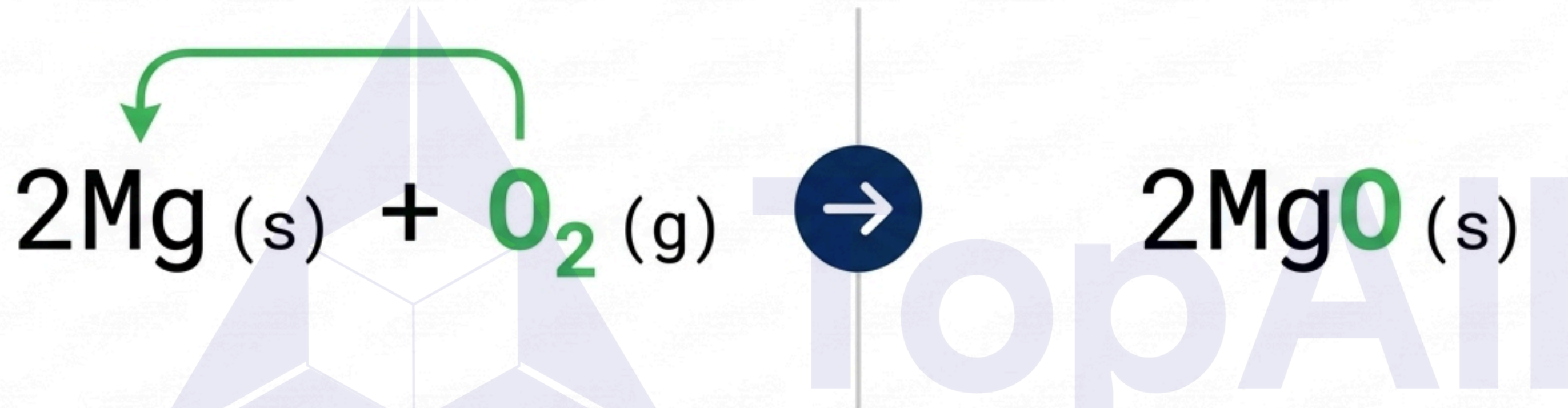
Extracting highly reactive metals and non-metals from their naturally occurring ores.



Corrosion

The gradual degradation and rusting of metals over time when exposed to the atmosphere.

Defining Oxidation: Addition of Oxygen



Magnesium is oxidized because oxygen is added to it. Because the atmosphere contains ~20% dioxygen, this is the principal reason many elements naturally occur as oxides on Earth.



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

$$E=mc^2$$



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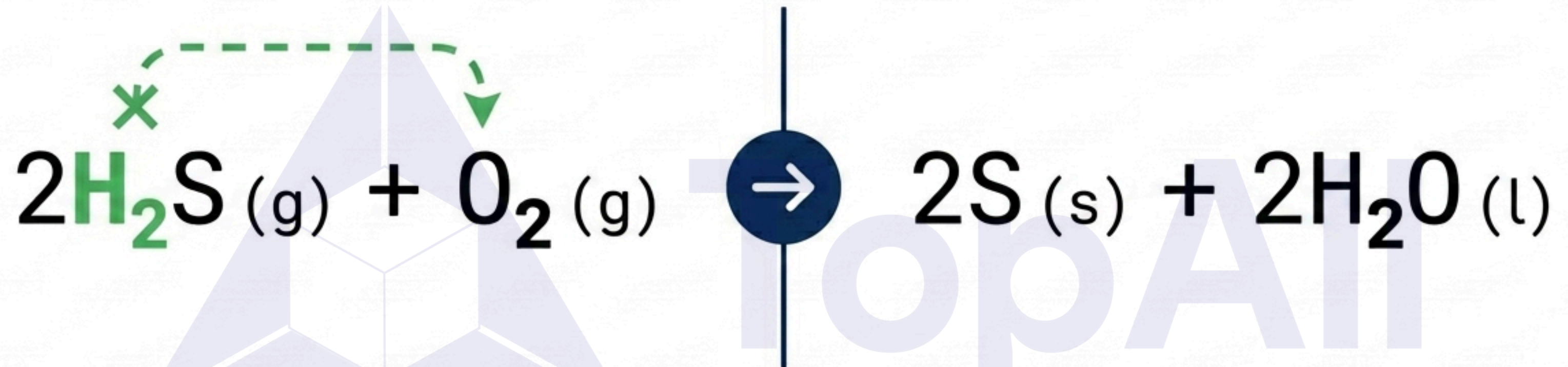
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Key Highlights

- » Free Study Material, Videos & Infographics
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- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter

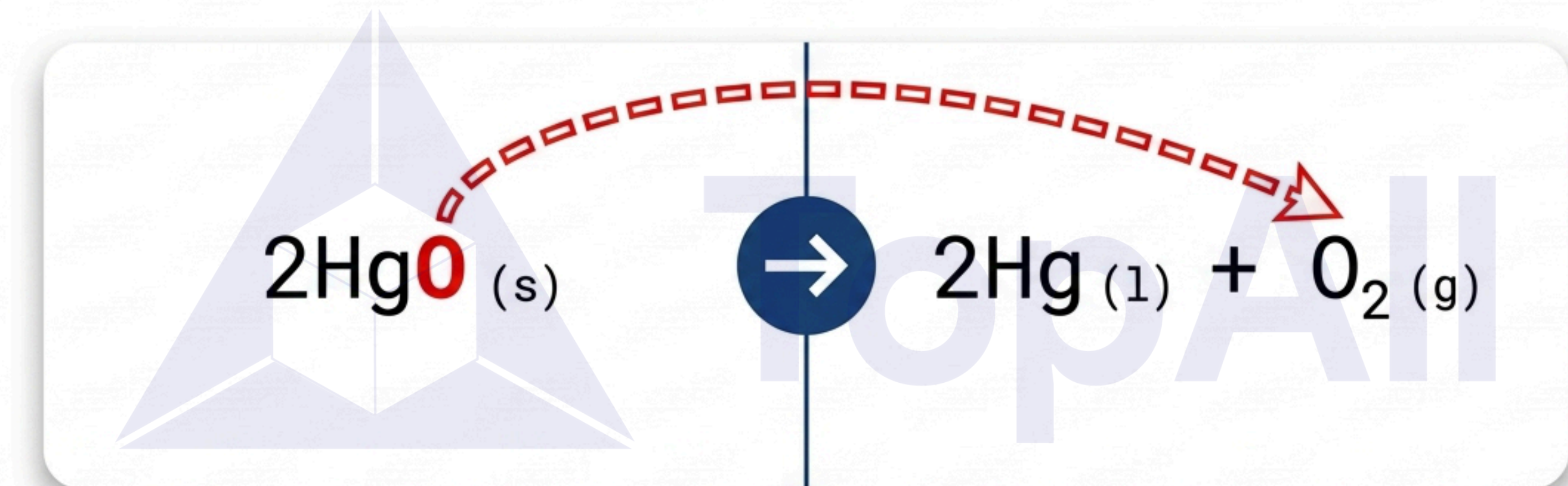


Broadening Oxidation: Removal of Hydrogen



Hydrogen is removed from Hydrogen Sulphide (H_2S). Therefore, Sulphur is oxidized.

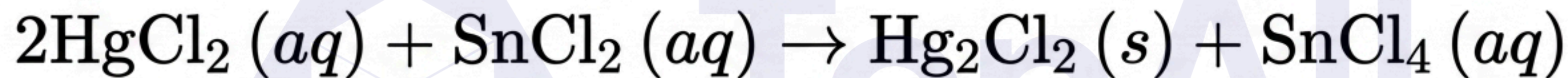
Defining Reduction: The Inverse Process



Oxygen is removed from Mercuric Oxide (HgO).
Therefore, Mercury is reduced.

Redox Happens Together

Oxidation: SnCl_2 gains electronegative Chlorine $\rightarrow \text{SnCl}_4$



Reduction: HgCl_2 loses electronegative Chlorine relative to Hg $\rightarrow \text{Hg}_2\text{Cl}_2$

Where there is oxidation, there is always reduction.

Key Takeaways: The Classical Definitions

Process	Oxidation	Reduction
Oxygen	 Addition	 Removal
Hydrogen	 Removal	 Addition
Electronegative Element	 Addition	 Removal
Electropositive Element	 Removal	 Addition

Oxidation and reduction always occur simultaneously as a paired Redox system.



You've Learned the Theory.

Now Let's Test It.

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