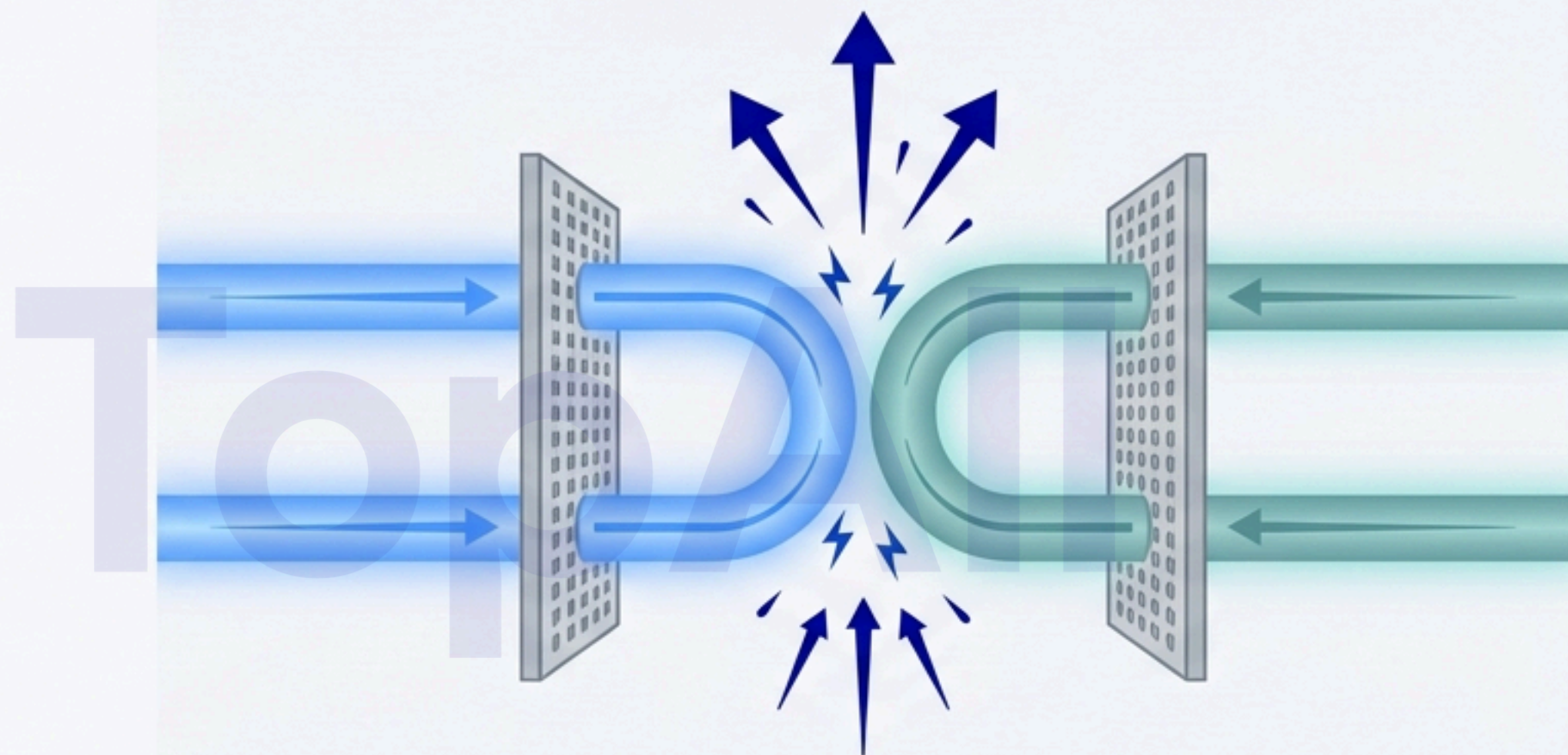
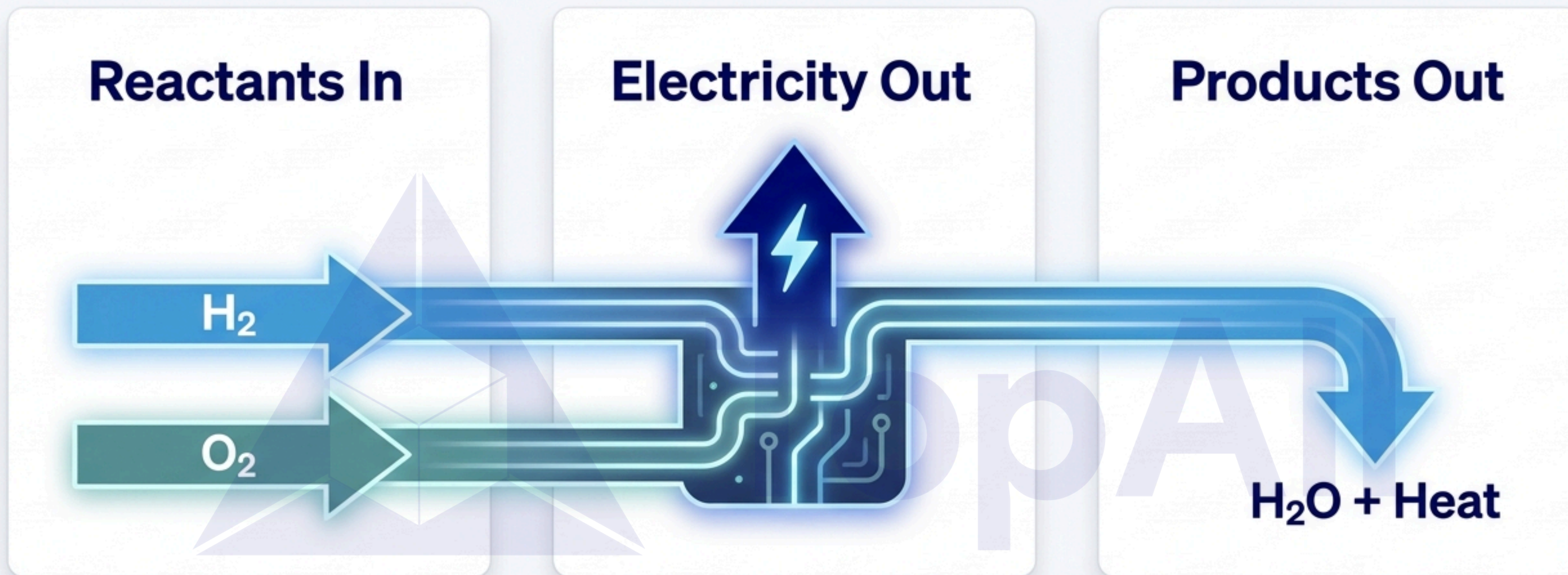


JEE MAIN + ADVANCED

Hydrogen-Oxygen Fuel Cell

Continuous
Electrochemistry



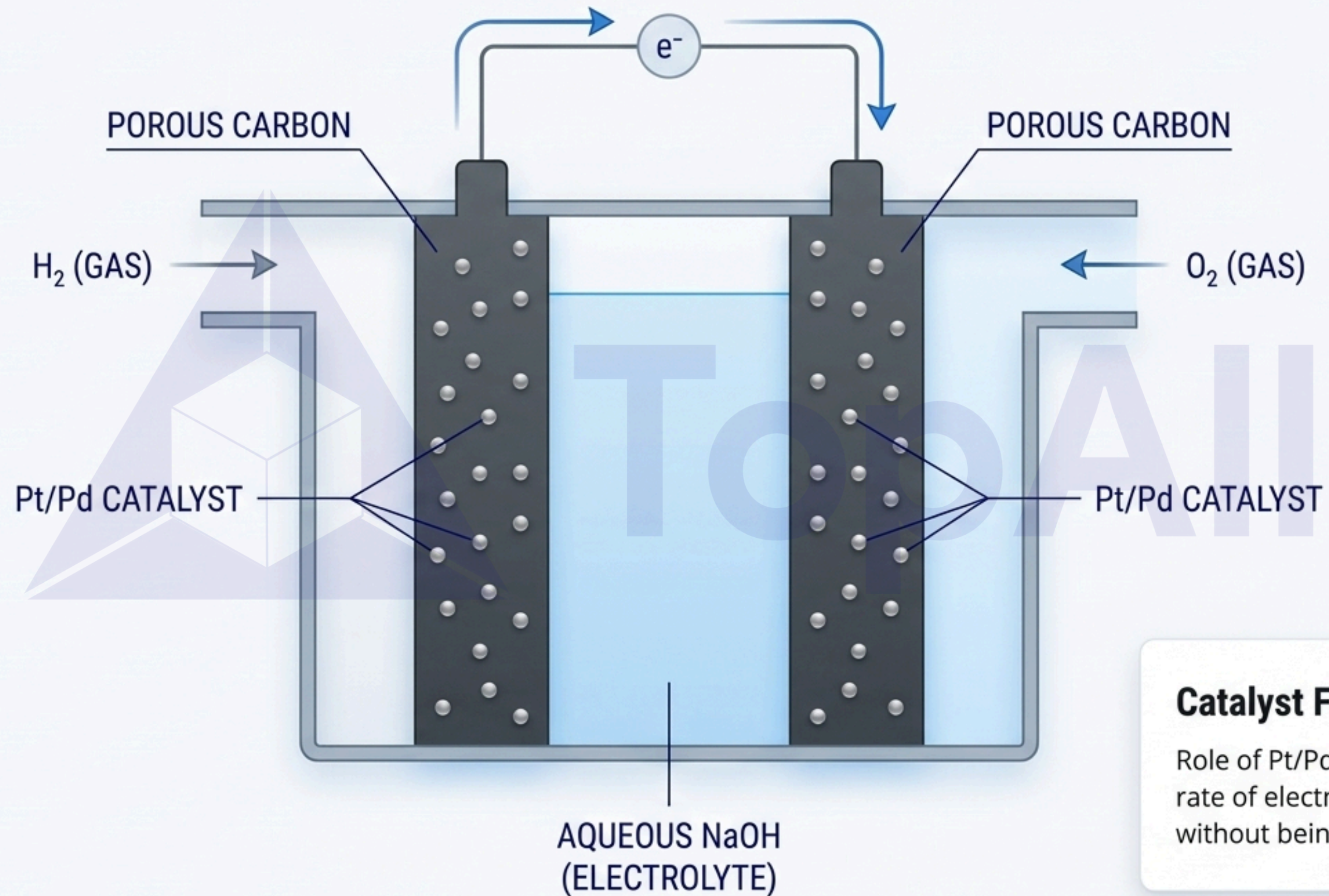


Unlike standard galvanic cells, fuel cells do not store chemical energy. They act as continuous conversion engines.

JEE Trap

Trap: Assuming fuel cells are 'rechargeable' like secondary batteries.

Truth: They do not need recharging; they run infinitely as long as external reactants are pumped in.



Catalyst Function

Role of Pt/Pd: Increases the rate of electrode reactions without being consumed.



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

$$E=mc^2$$



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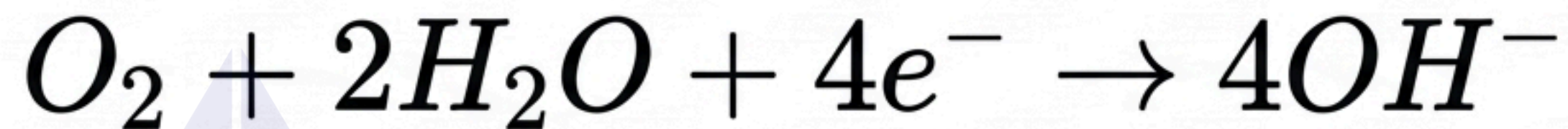
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- » Push Your Limits with Level-Based Challenges
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- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter

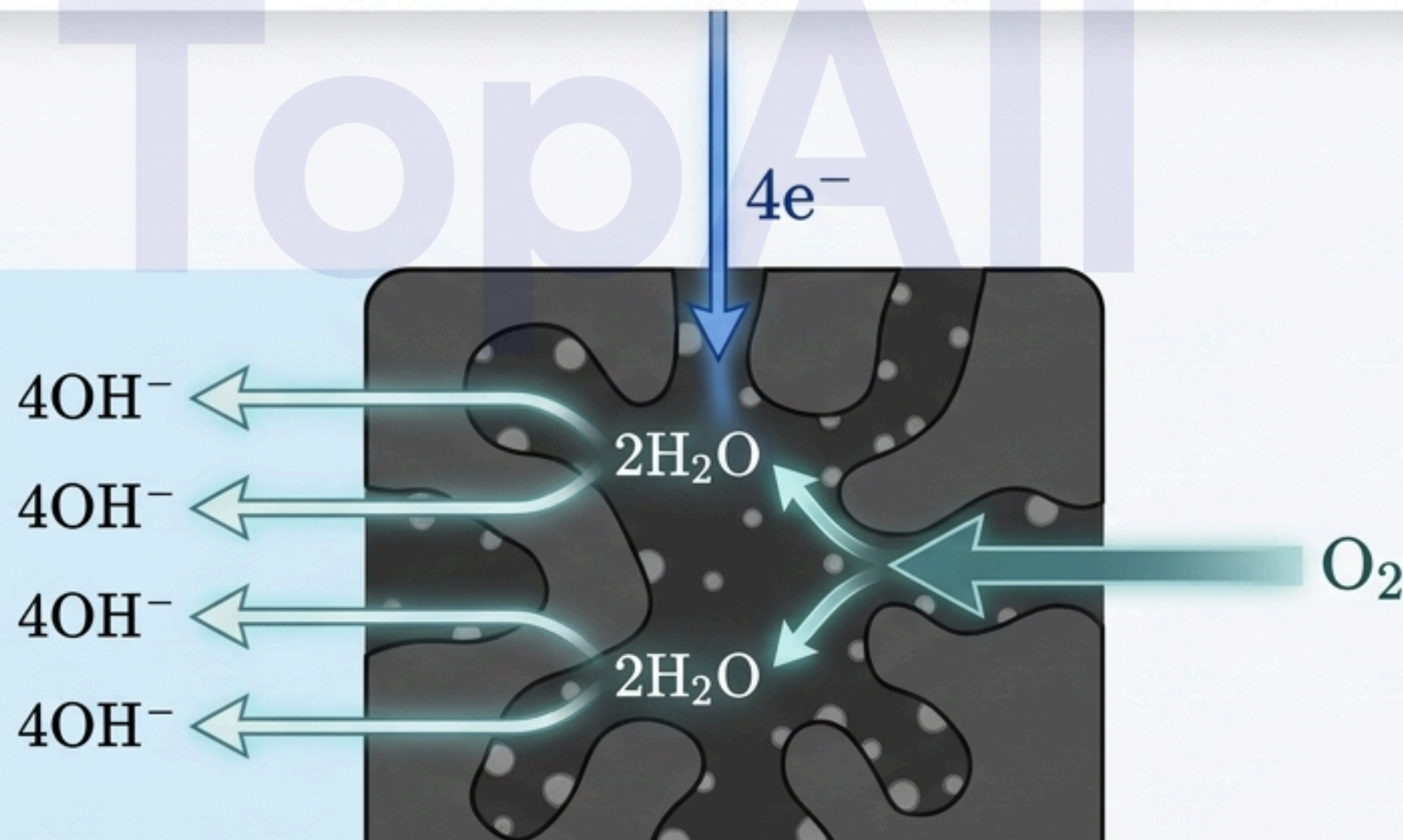


CATHODE (REDUCTION)

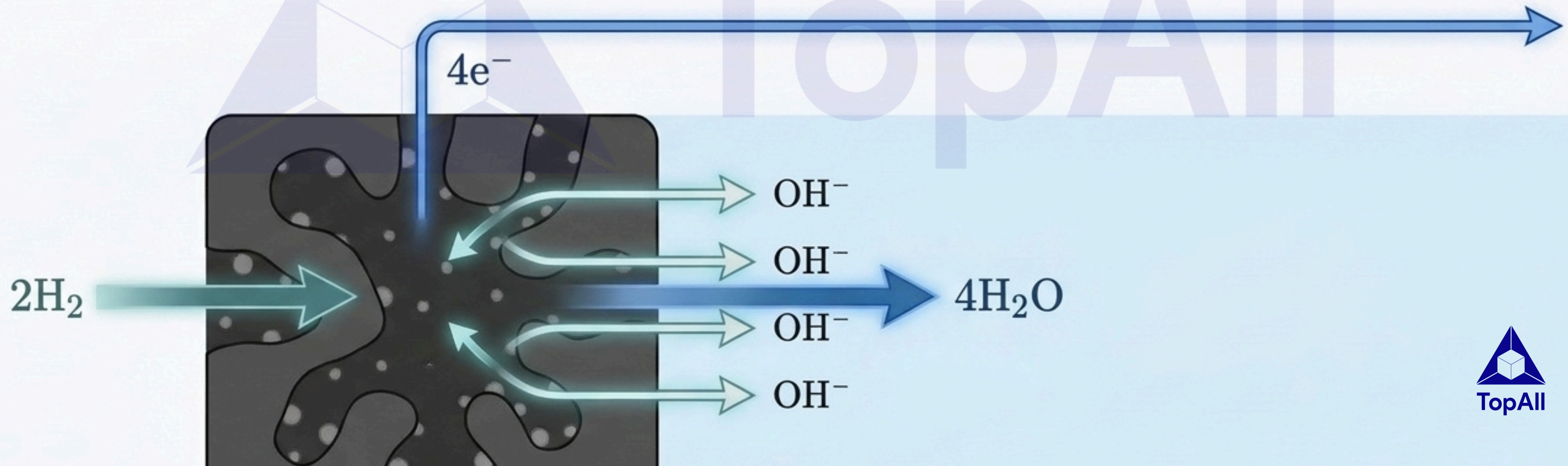
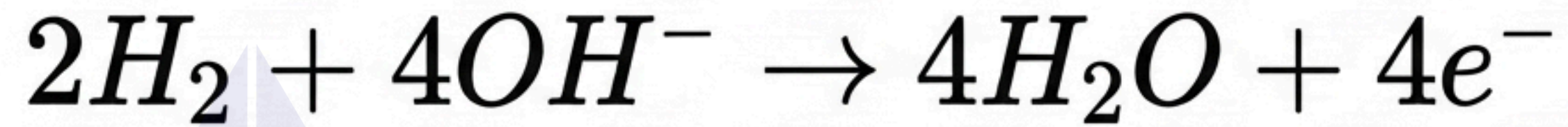


JEE Trap

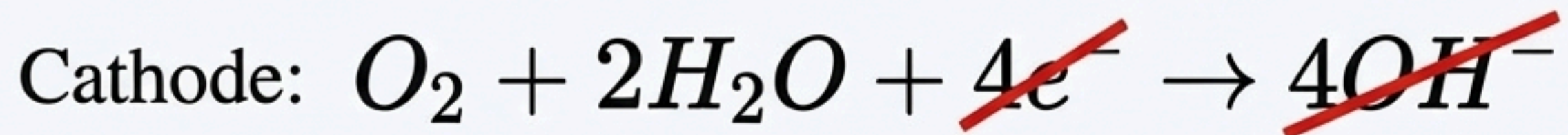
Trap: Confusing the electrodes.
In a hydrogen-oxygen fuel cell,
Oxygen gas is always fed to the
Cathode (undergoing Reduction).



ANODE (OXIDATION)



REACTION MAP: COMBINING HALF-REACTIONS



Sum:



Key Takeaways

1. The cell operates continuously as long as reactants (H_2 and O_2) are supplied.
2. The sole chemical byproduct is H_2O (condensed as drinking water for Apollo astronauts).
3. The concentration of the NaOH electrolyte remains constant over time.

HIGH IMPACT HORIZONTAL COMPARISON

Fuel Cell

~70%

Thermal Plant

~40%

Fuel cells directly convert the chemical energy of fuel into electricity, bypassing the highly inefficient intermediate steps of burning fuel to produce steam to spin a turbine.



You've Learned the Theory.

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