

The Equilibrium Behind Colour Change

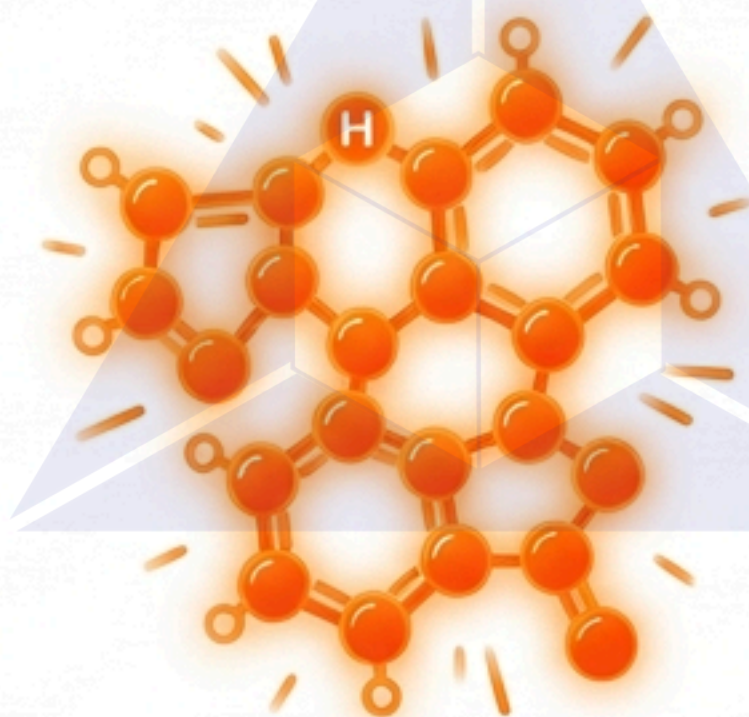
24. Acid-Base Indicators



The Dual Identity of Indicators

Water-soluble organic compounds (like phenolphthalein) that behave as weak acids or bases.

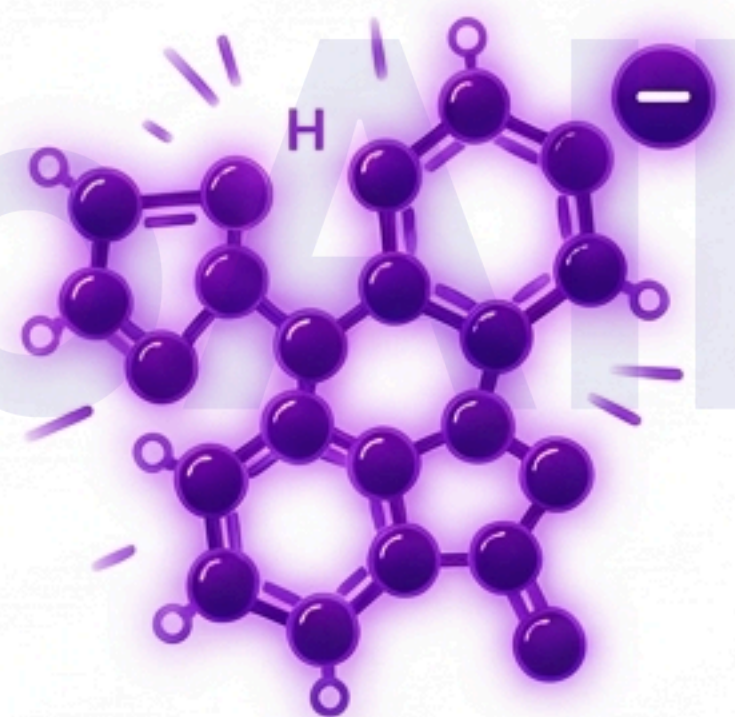
Acid Form



Colour A



Conjugate Base Form

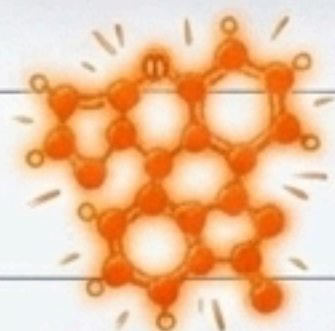
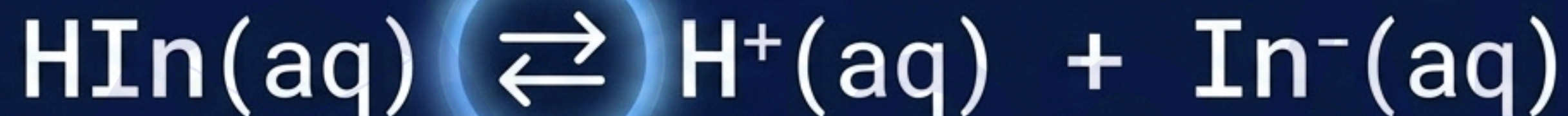


Colour B

The Chemical Engine

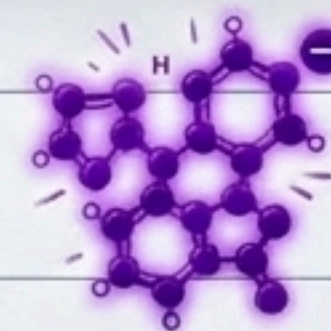
The dynamic balance between the acid and its conjugate base.

Formula Bank



Colour A
(Undissociated)

Dynamic Equilibrium:
Both forms coexist. The dominant concentration dictates the visible colour.



Colour B
(Ionized)



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

$$E=mc^2$$



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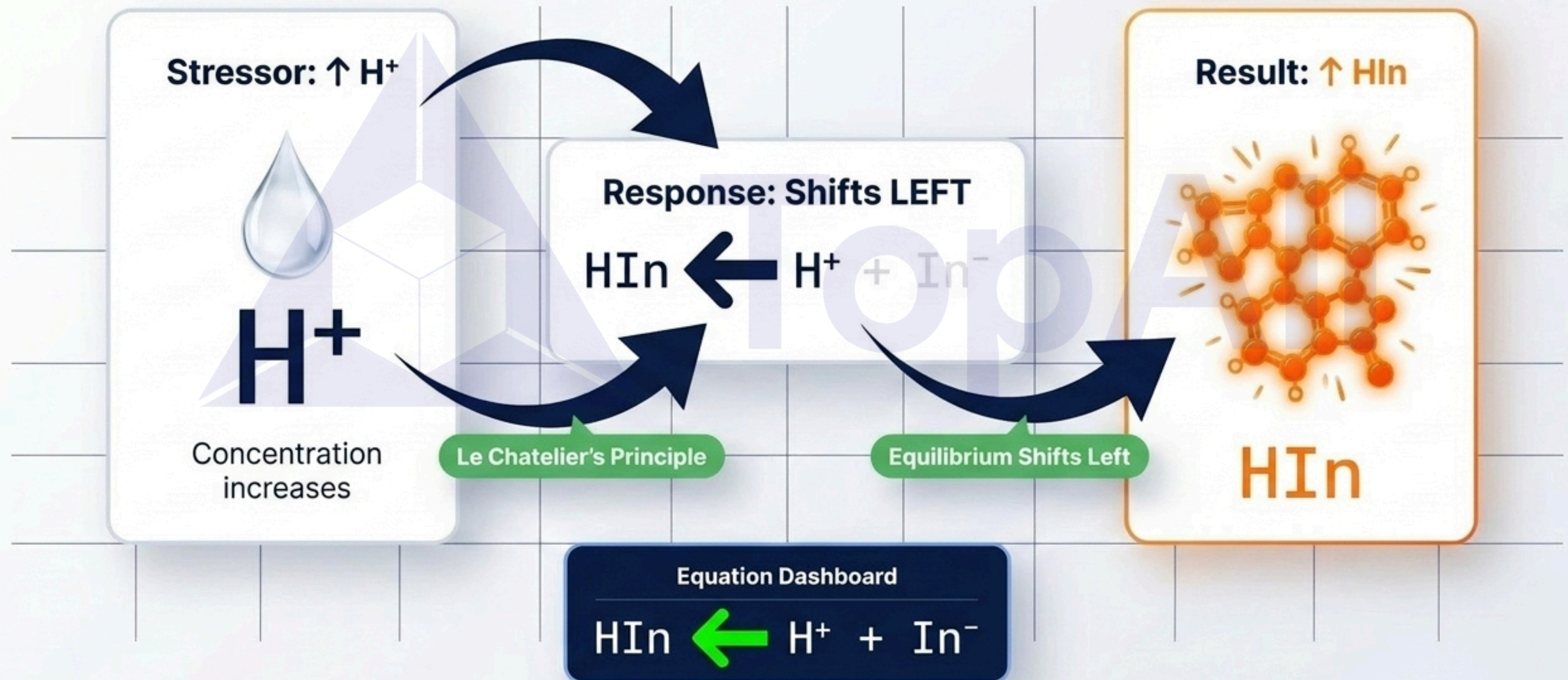
Key Highlights

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- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
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- » Get Clear Explanations, Not Just Marks
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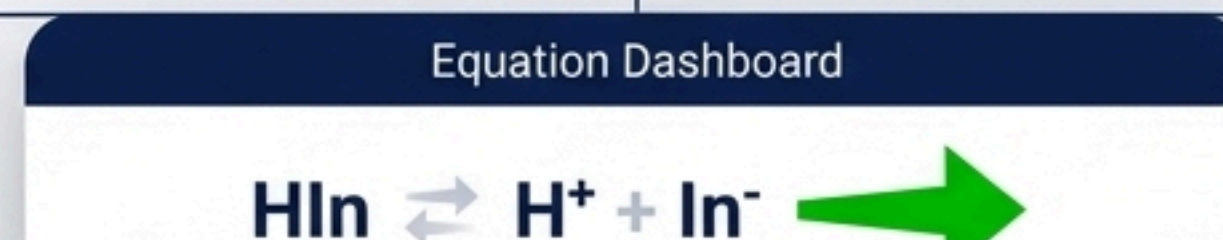
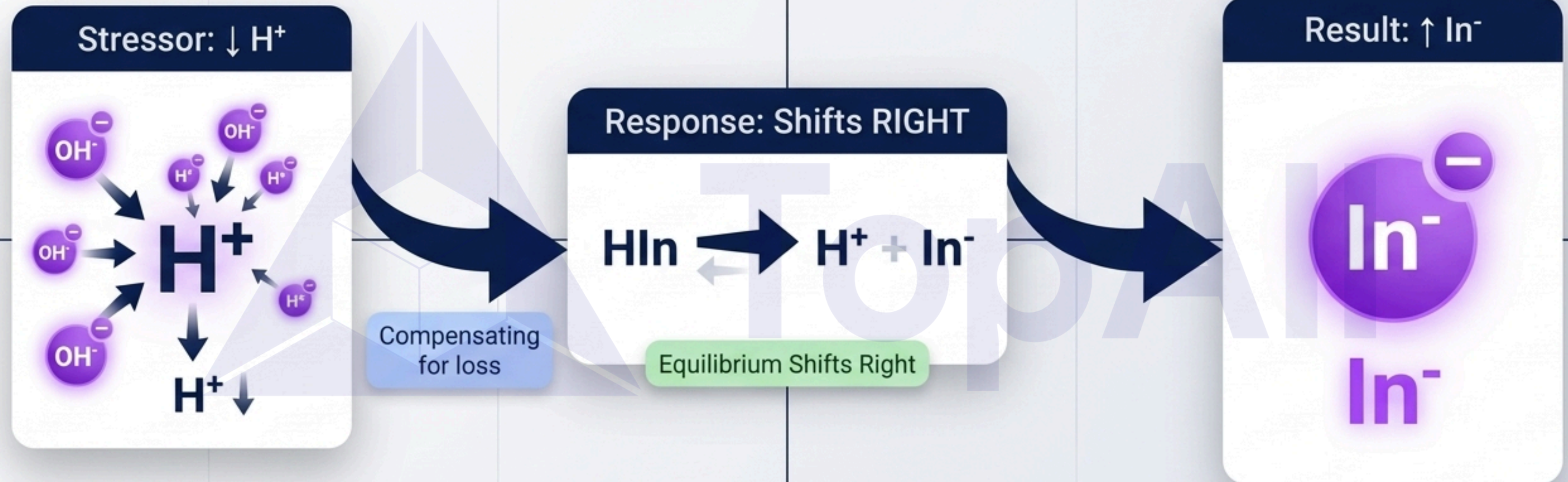


System Response: Acidic Medium

Causal flowchart



System Response: Basic Medium



Diagnostic Split: The Mechanism

The Illusion

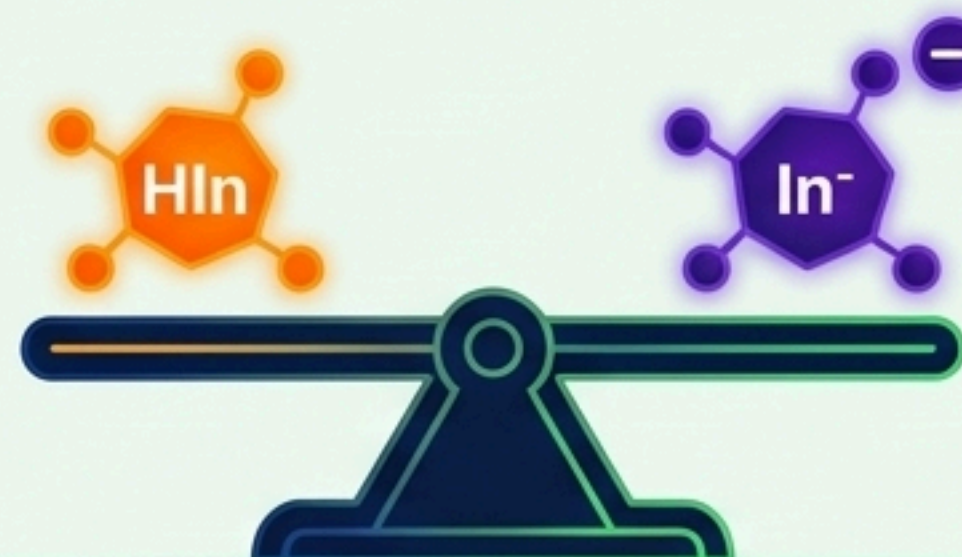


The indicator reacts permanently with the acid/base to create a brand new coloured compound.

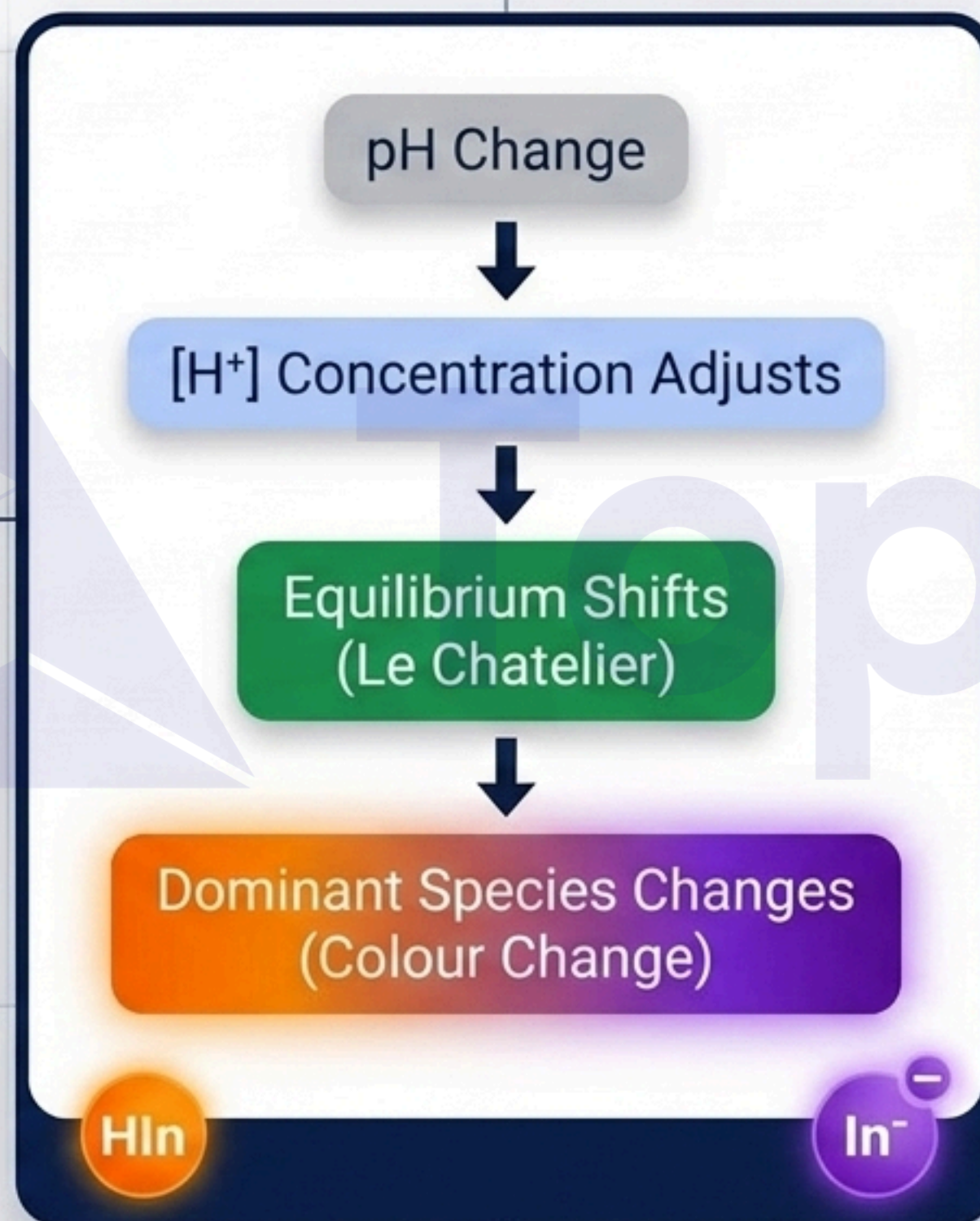
The Reality



The colour change is purely a **temporary equilibrium shift** between two existing forms (HIn and In^-). It is fully reversible.



Exam Snapshot: The Indicator Algorithm





You've Learned the Theory.

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