



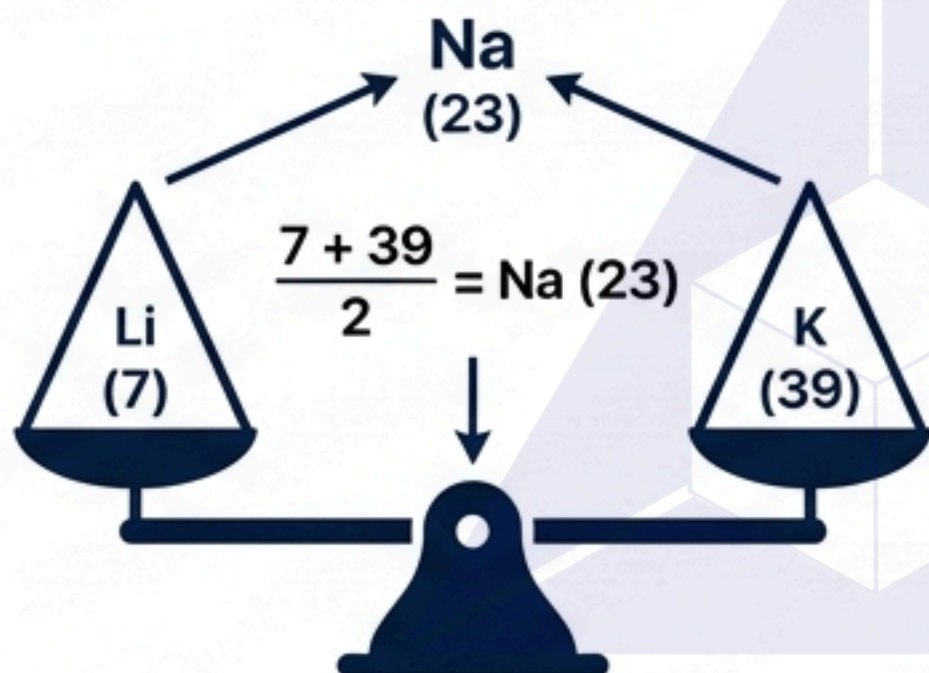
From Triads to Mendeleev

The Genesis of Periodic Classification

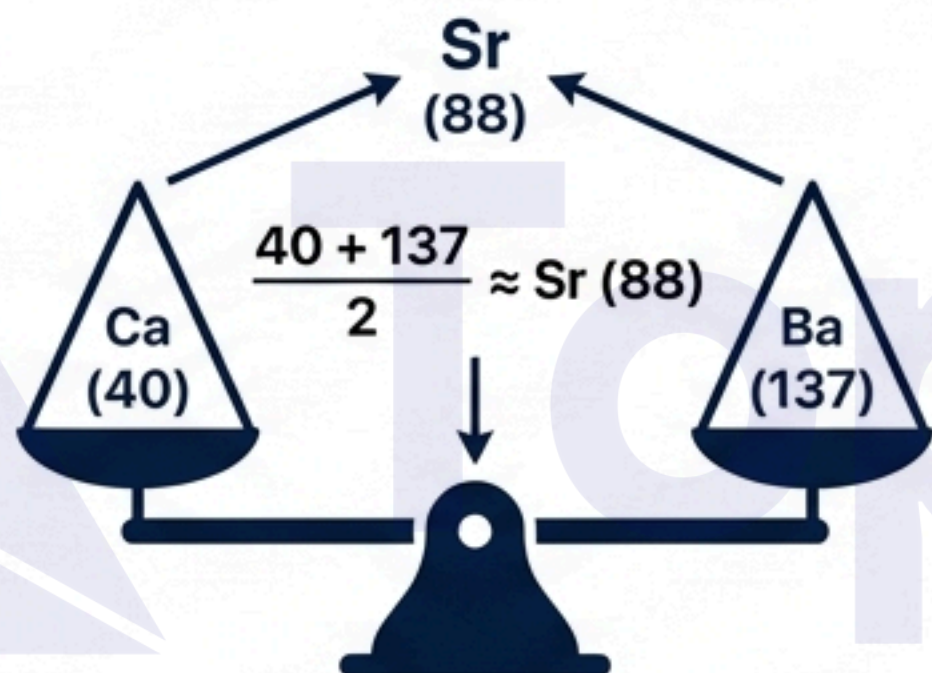
The classification of elements wasn't a single discovery—it was a decades-long puzzle of iterative pattern recognition.

The Law of Triads: Mathematical Averages

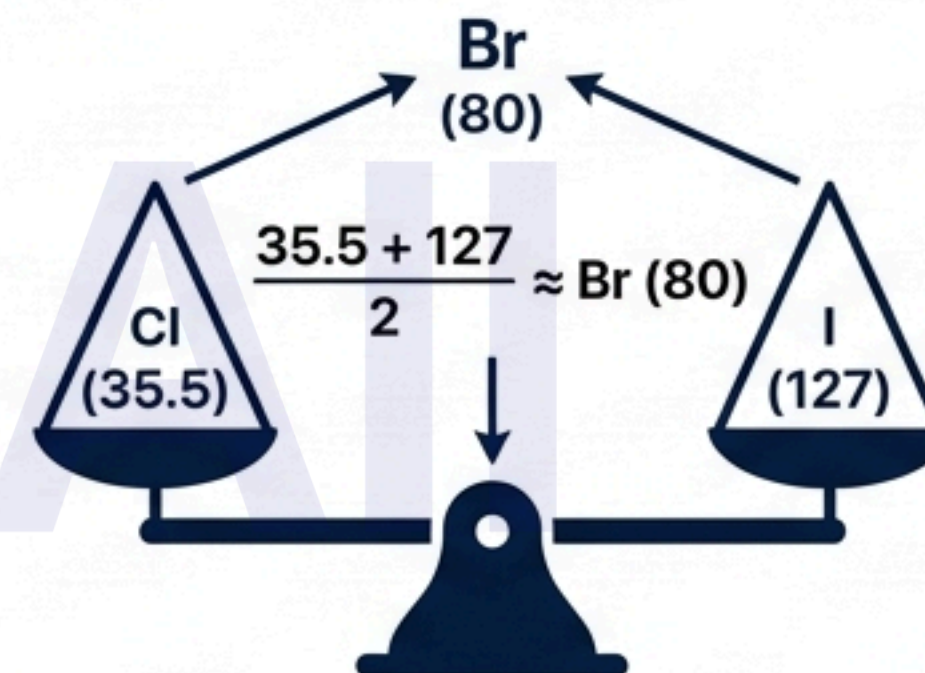
Alkali Group



Alkaline Earth



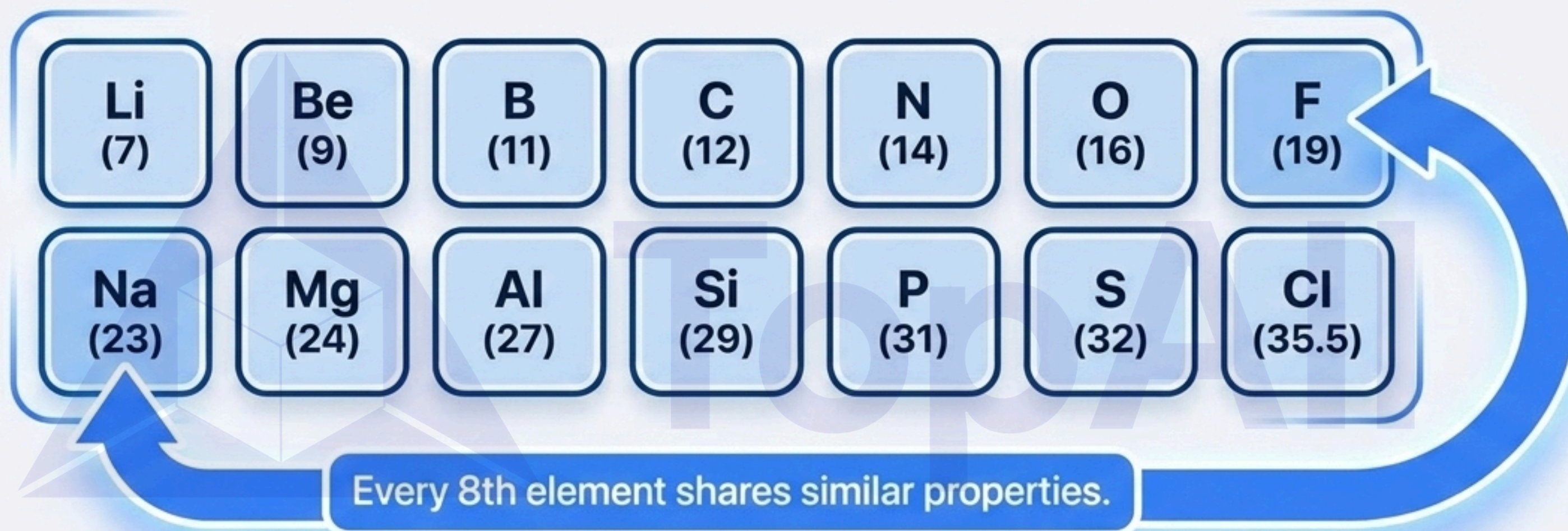
Halogens



⚠ Exam Trap: The Fatal Flaw

Dismissed as mere coincidence because the triad relationship worked for only a few specific groups of elements.

The Law of Octaves: Cyclical Repetition



⚠ Limitation

The Law of Octaves only held true for lighter elements up to Calcium (Ca). It failed completely for heavier elements.



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$$E=mc^2$$



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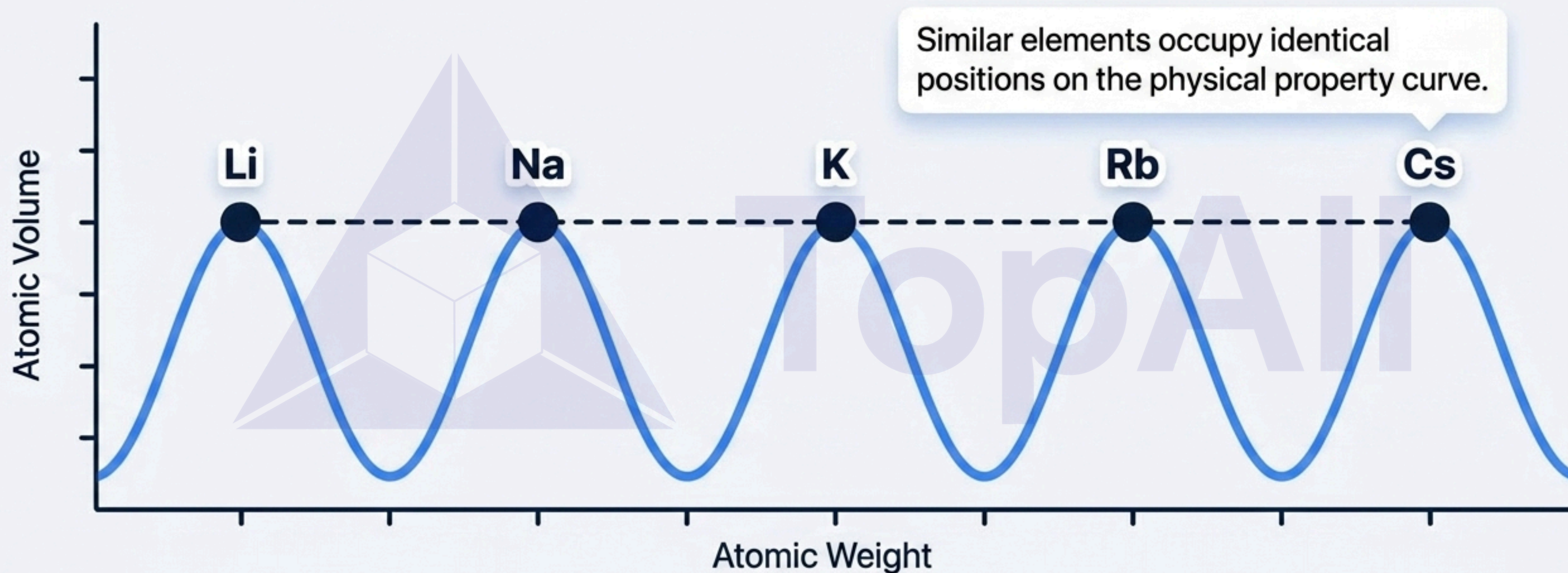
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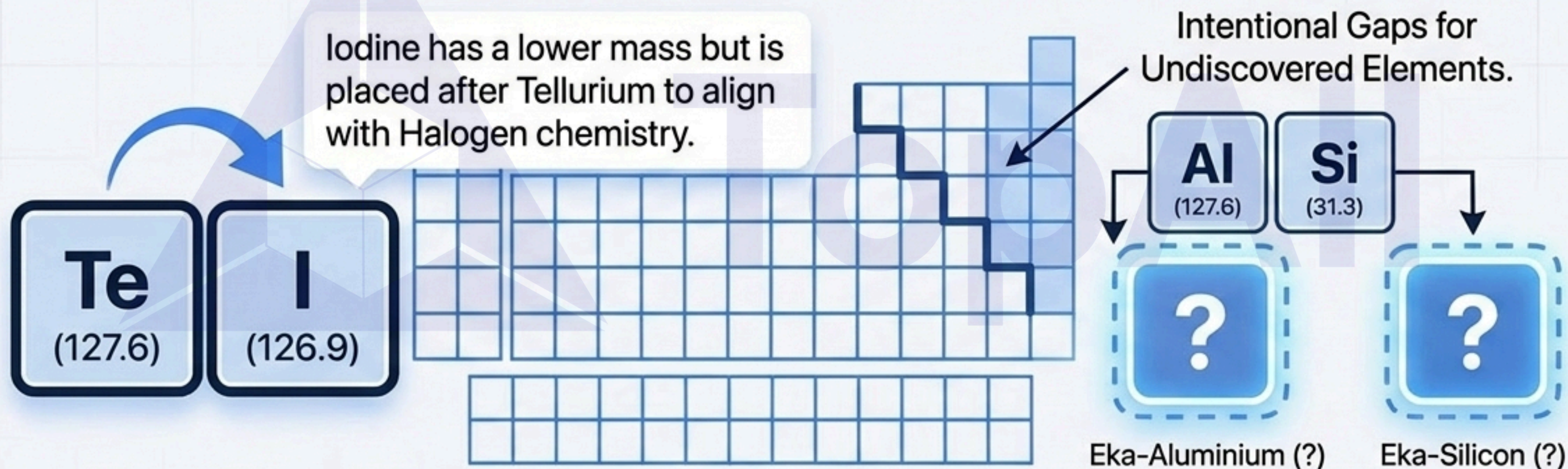
Periodicity in Physical Properties



Meyer mapped physical properties (volume, melting/boiling points) and built a table resembling the modern one, but remained unpublished until after Mendeleev.

The Periodic Law: Chemistry Over Mass

The properties of elements are a periodic function of their atomic weights.



Mendeleev ignored strict atomic weight order when chemical properties demanded it, intentionally leaving gaps for undiscovered elements.

The Power of Prediction

Eka-Aluminium vs. Gallium

Weight:	Predicted: 68	Found: 70
Density:	Predicted: 5.9	Found: 5.94
Oxide Formula:	Predicted: E₂O₃	Found: Ga₂O₃

Eka-Silicon vs. Germanium

Weight:	Predicted: 72	Found: 72.6
Density:	Predicted: 5.5	Found: 5.36
Chloride Formula:	Predicted: ECl₄	Found: GeCl₄

The boldness and exactness of these quantitative predictions forced the scientific community to accept his Periodic Table.

Match the Scientist to the Model

Dobereiner

Atomic weight of middle element is the average. (Failed: Only few existed).

Newlands

Every 8th element repeats properties. (Failed: Stopped at Calcium).

Lothar Meyer

Plotted physical property curves (Atomic volume vs weight).

Mendeleev

Left gaps, predicted properties, relied on chemical formulas over strict mass.

Mastery Check: Historical limitations are as heavily tested in JEE as the actual discoveries.



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