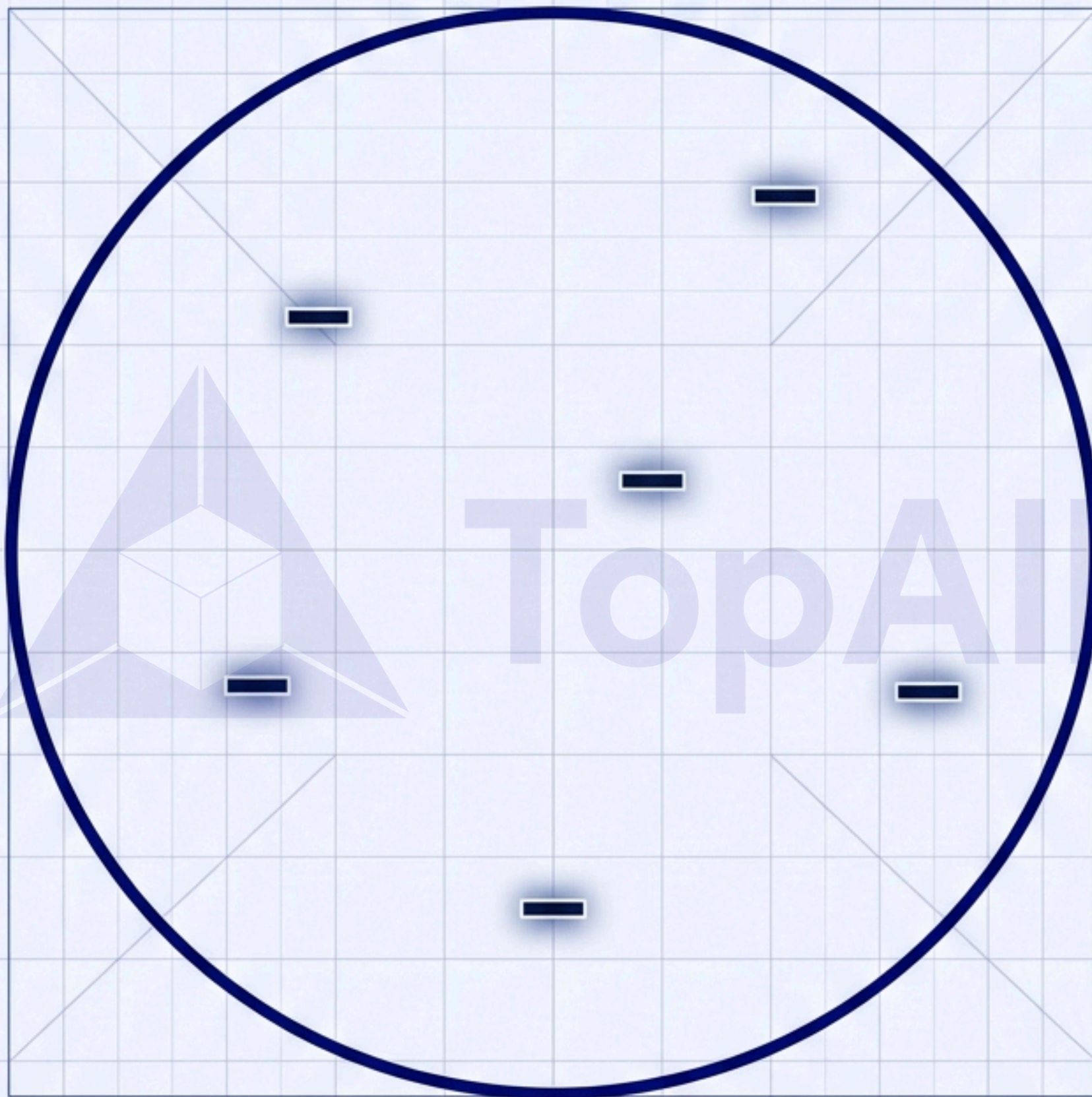


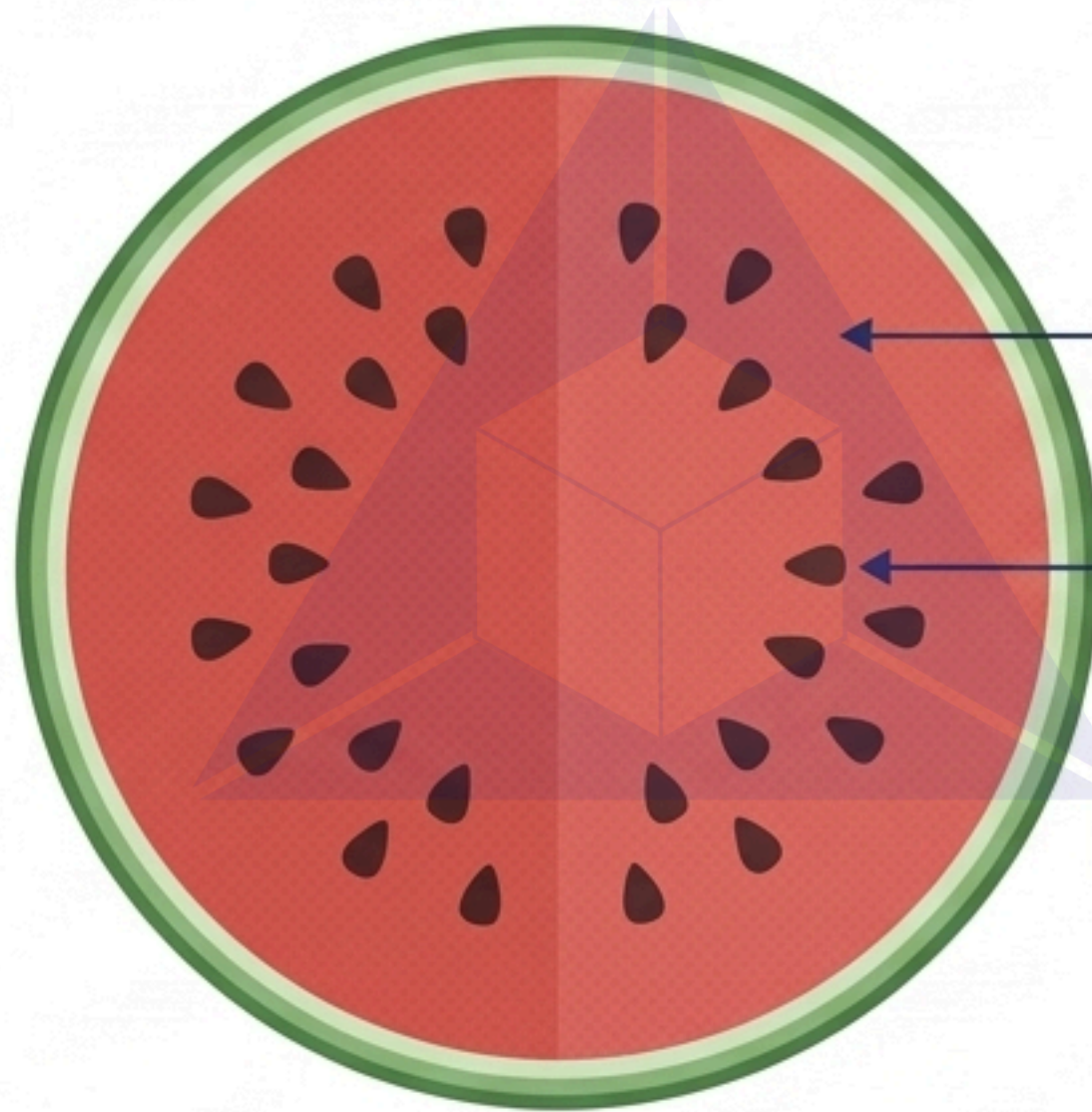
Thomson Model of Atom



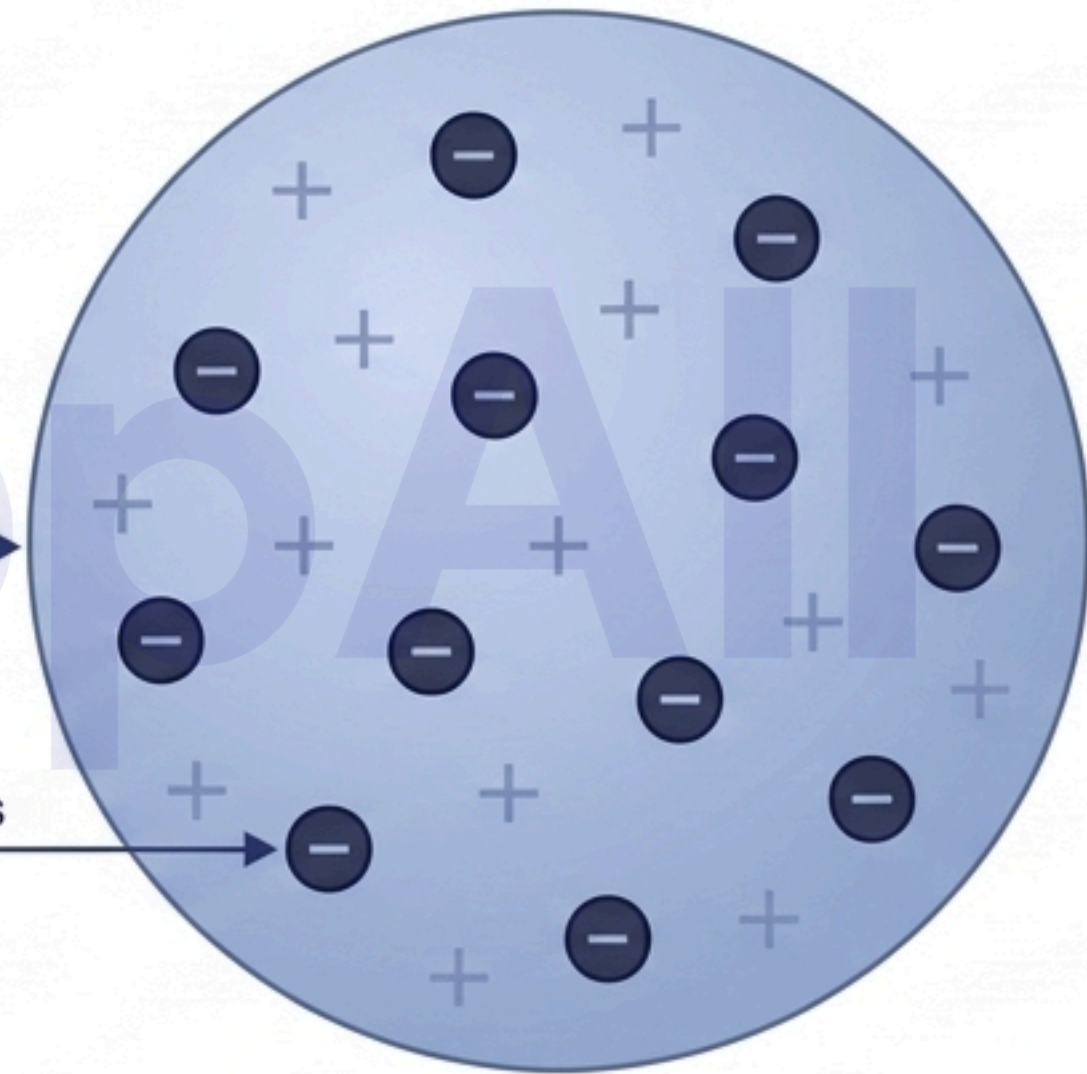
Proposed by British physicist J.J. Thomson in 1898, shortly after his discovery of the electron. It represents the very first scientific attempt to map the internal architecture of the atom.

The Core Visual Analogy

The Analogy



The Physics

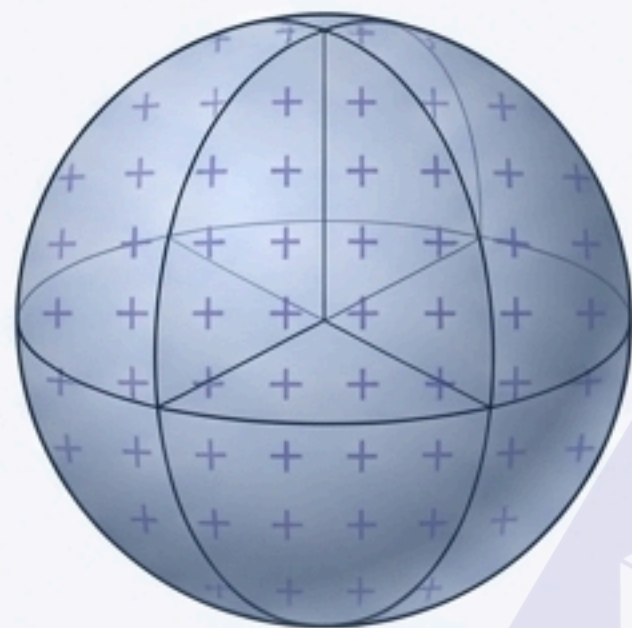


Uniform Positive Sphere

Embedded Negative Electrons

Often referred to as the plum pudding, raisin pudding, or watermelon model, it visualizes electrons placed to give the most stable electrostatic arrangement.

Key Postulates & Features



Charge Distribution

The atom is a spherical shape with a radius of approximately 10^{-10} m. The positive charge is uniformly distributed throughout this entire volume.



Mass Distribution

An essential theoretical feature is that the **mass of the atom** is assumed to be uniformly distributed over the entire atom, not concentrated in any single location.



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$$E=mc^2$$



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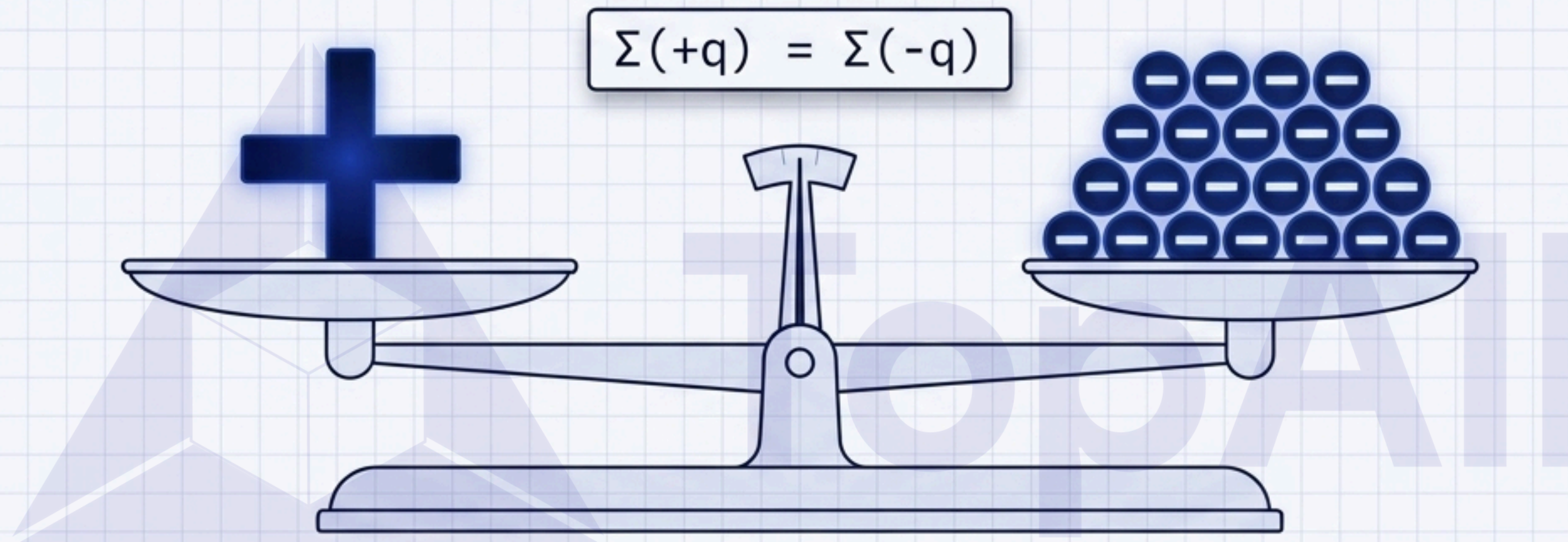
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The Success: Electrical Neutrality



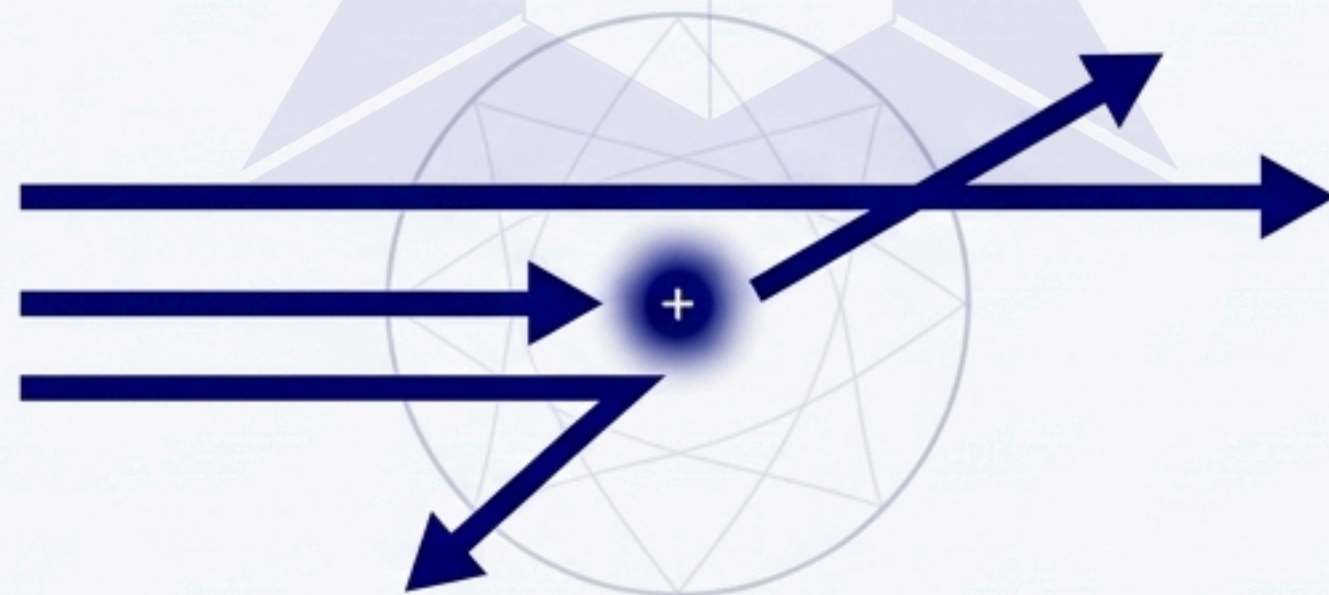
The model successfully explained the overall electrical neutrality of the atom. Thomson's theoretical and experimental investigations (earning the 1906 Nobel Prize in Physics) provided a mathematically stable electrostatic arrangement that fit the data available at the time.

The Limitation: Breaking Under the Alpha Test



EXPECTATION

If mass and charge were uniform (Thomson), high-energy α -particles should pass directly through.



REALITY

A fraction of α -particles deflected at extreme angles (up to 180°), proving the mass and positive charge must be densely concentrated in an extremely small region.

JEE Focus & Key Takeaways



The Core Truth

The Thomson model's primary historical validity is its explanation of the atom's **overall electrical neutrality**.



Conceptual Caution

Assertion/Reasoning Trap: Remember that Thomson **assumed the mass** is uniformly distributed, not just the charge. This is exactly what Rutherford disproved.



The Ultimate Trap

NO NUCLEUS. Never apply nuclear concepts to the Thomson model. The concept of a 'nucleus' was entirely unknown until Rutherford's subsequent experiments.



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