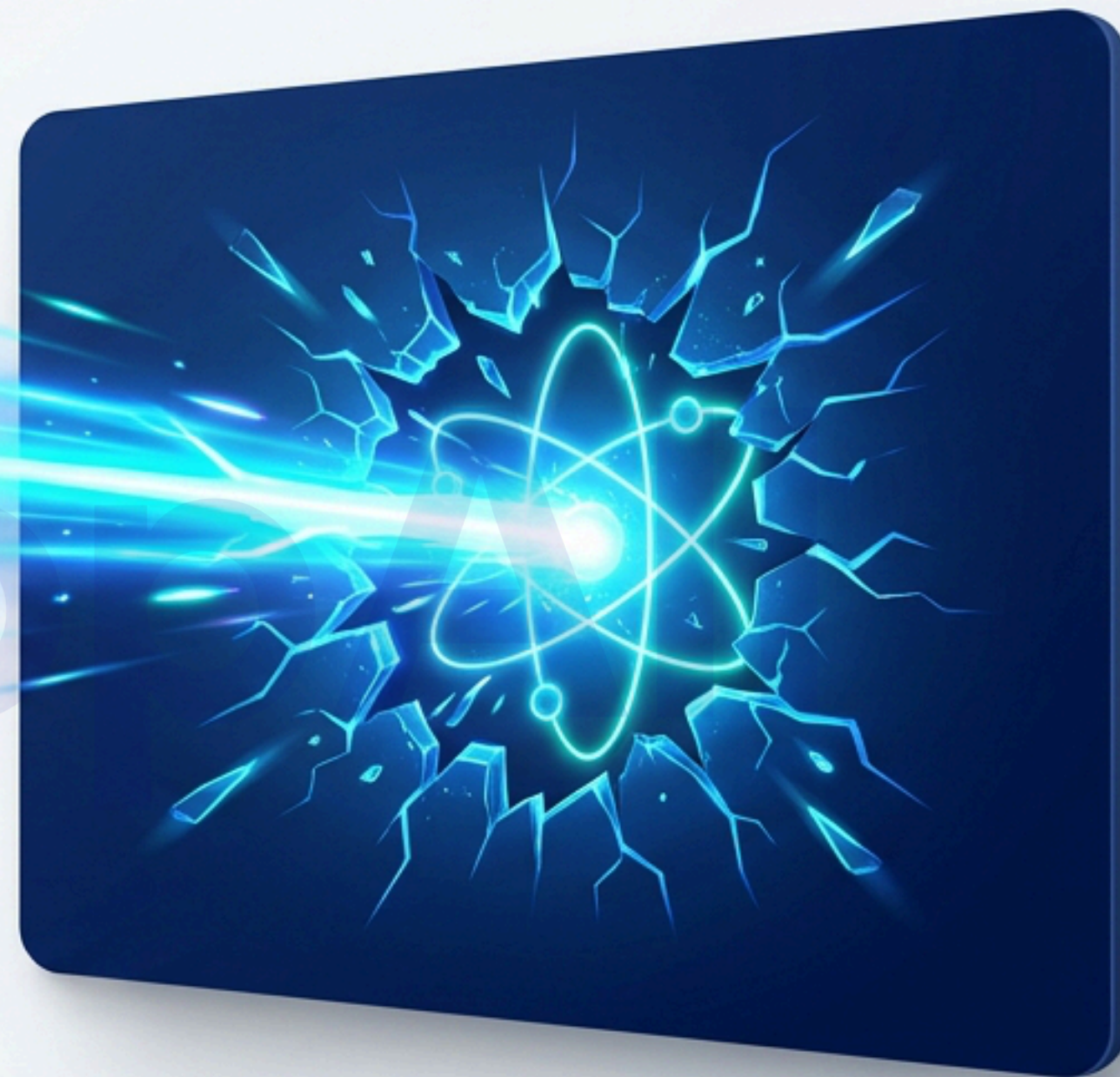


CLASS 11 CHEMISTRY • CHAPTER 2

2.1 Discovery of Sub-atomic Particles

Illuminating the invisible structure of matter.



Why Dalton's Atom Became Incomplete

The Accepted Theory (1808)



Dalton's Atomic Theory: The atom is the ultimate, indivisible building block of matter. It cannot be broken down further.

The Anomaly (1850s)



Static Electricity: Substances like glass or ebonite rubbed with silk or fur generate electrical charges.

PARADOX

If atoms cannot be broken, where do the internal electrical charges in static electricity come from? Matter must possess an internal structure.

Electrical Discharge Through Gases

[CONDITION: Very Low Pressure]

[CONDITION: Very High Voltage]

Cathode (Negative Electrode)

Origin of the stream.

Anode (Positive Electrode)

Perforated to allow rays to pass.

Cathode (Negative Electrode)

Origin of the stream.

Cathode Rays

Zinc Sulphide Screen

Phosphorescent coating glows when struck by invisible rays.

When high voltage is applied to an evacuated tube, a stream of particles flows from the negative cathode to the positive anode. These invisible streams are called cathode rays.



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

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter

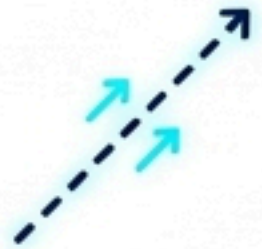


How Scientists Inferred Smaller Particles Inside Atoms

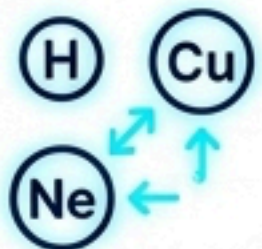
Behavior Observed (Raw Data)



Deflects toward the positive pole in the presence of an electrical or magnetic field.



Travels in perfectly straight lines when electrical/magnetic fields are absent.



Characteristics of the rays do NOT depend on the electrode material or the nature of the gas.

Scientific Inference (Conclusion)

Consists of negatively charged particles (named **electrons**).

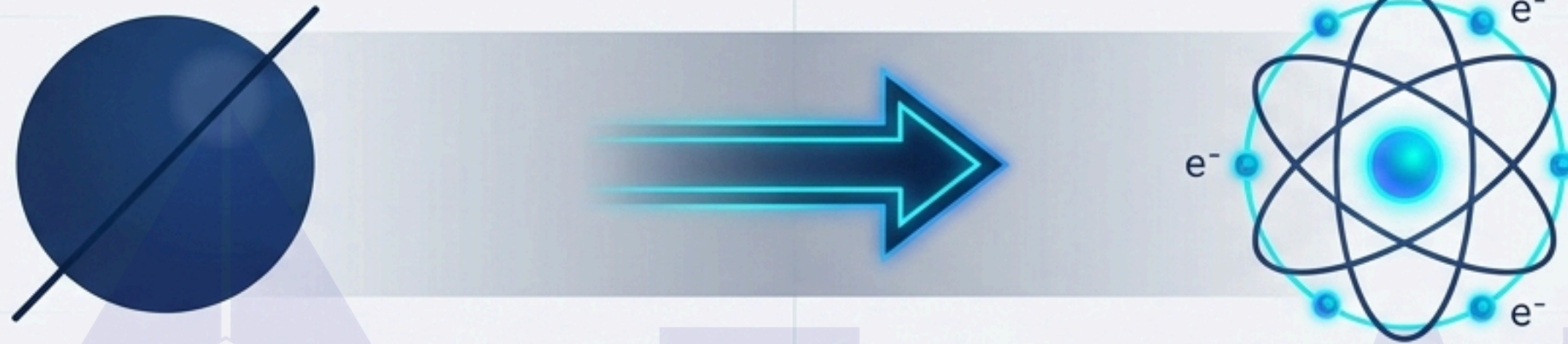
The rays possess a particulate nature and momentum.

These particles are a **universal** constituent of all atoms.



Inference = Electrons (e^-) exist in all matter.

Final Recap: The Atom is Divisible



The Paradigm Shift:

Atoms are NOT the ultimate, indivisible building blocks of matter. They have an internal structure.

The Experiment:

Cathode ray discharge experiments proved the existence of sub-atomic, negatively charged particles.

The Electron:

Electrons are a basic, universal constituent of all matter, regardless of the element.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis