

CLASS 9

SCIENCE

NCERT SOLUTIONS

NCERT Solutions for Class 9 Science Chapter 8: Journey Inside the Atom – Free PDF Download

Chapter 8 of Class 9 Science Exploration is Journey Inside the Atom. It traces how scientists gradually discovered what atoms are actually made of, from Thomson's model to Rutherford's and finally Bohr's model, and covers how electrons are arranged and how atoms are identified and compared. These Class 9 Science Cha...

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Chapter 8 of Class 9 Science *Exploration* is Journey Inside the Atom. It traces how scientists gradually discovered what atoms are actually made of, from Thomson's model to Rutherford's and finally Bohr's model, and covers how electrons are arranged and how atoms are identified and compared. These Class 9 Science Chapter 8 solutions are also useful as quick revision notes before exams.

Subatomic Particles

Atoms are made of three subatomic particles: **protons** (positive charge, in the nucleus), **neutrons** (no charge, in the nucleus), and **electrons** (negative charge, orbiting the nucleus).

Thomson's Model

J. J. Thomson proposed the "plum pudding model" — a sphere of uniformly distributed positive charge with electrons embedded in it, like plums in a pudding.

Rutherford's Model

Rutherford's gold foil experiment showed that most of an atom's mass and positive charge is concentrated in a tiny, dense **nucleus**, with electrons revolving around it in mostly empty space. This overturned Thomson's model but couldn't explain why orbiting electrons don't spiral into the nucleus.

Bohr's Model

Niels Bohr proposed that electrons revolve in specific, fixed energy levels (or **shells**, labelled K, L, M, N...) without radiating energy, resolving the stability problem in Rutherford's model.

Electron Distribution in Shells

Electrons fill shells according to the rule $2n^2$ (maximum electrons in shell n): K-shell ($n=1$) holds up to 2, L-shell ($n=2$) up to 8, M-shell ($n=3$) up to 18 (though up to 8 when it's the outermost shell for elements up to atomic number 18), N-shell ($n=4$) up to 32. For elements up to atomic number 18, electrons fill K, then L, then M shells in order.

Atomic Number, Mass Number, Isotopes, Isobars

Atomic number (Z) = number of protons in the nucleus (also equals number of electrons in a neutral atom).

Mass number (A) = number of protons + number of neutrons.

Isotopes — atoms of the same element (same atomic number) with different mass numbers (different neutron counts), e.g. Carbon-12 and Carbon-14.

Isobars — atoms of different elements with the same mass number but different atomic numbers.

Valency

Valency is the combining capacity of an atom, determined by the number of electrons in its outermost shell (valence electrons) — how many electrons it needs to gain, lose, or share to achieve a stable outer shell.

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