

Sub-atomic Particles

Chapter 4: Structure of the Atom · Topic 1

Key Concept

The number of protons in an atom's nucleus, called the atomic number, uniquely identifies each element — for example, all atoms with exactly 6 protons are carbon atoms, regardless of how many neutrons they have. Atoms of the same element with different numbers of neutrons are called isotopes — for instance, carbon-12 and carbon-14 are both carbon but have different neutron counts, giving them slightly different masses while retaining identical chemical properties.

Quick Revision Notes

- Protons: positive charge, in nucleus. Neutrons: neutral charge, in nucleus. Electrons: negative charge, orbiting nucleus.
- Protons and neutrons contribute nearly all of an atom's mass.
- Atomic number = number of protons, uniquely identifying an element.
- Isotopes are atoms of the same element with different numbers of neutrons.

Practice Questions

- 1 Name the three sub-atomic particles found in an atom and their charges.
- 2 Explain what makes carbon-12 and carbon-14 both isotopes of carbon.
- 3 Why does an atom have no overall electric charge under normal conditions?