

Radioactivity

Chapter 12: Radioactivity · Topic 1

Key Concept

Alpha particles are helium nuclei (2 protons, 2 neutrons), having low penetration power but high ionising ability.

Beta particles are high-speed electrons, having moderate penetration power, more than alpha but less than gamma radiation.

Gamma rays are high-energy electromagnetic radiation, having the highest penetration power but lower ionising ability compared to alpha and beta.

Radioactivity has applications in medicine (cancer treatment, diagnostics), power generation (nuclear reactors), and carbon dating for determining age of ancient materials.

Quick Revision Notes

- Alpha particles: helium nuclei (2p, 2n).
- Alpha has low penetration, high ionising ability.
- Beta particles: high-speed electrons.
- Beta has moderate penetration power.
- Gamma rays: high-energy electromagnetic radiation.
- Gamma has highest penetration, lower ionising ability.
- Applications: medicine, power generation, carbon dating.
- Radioactivity comes from unstable nuclei.

Practice Questions

- 1 Compare the penetration powers of alpha, beta and gamma radiation.
- 2 Discuss the composition of alpha particles.
- 3 Research a medical application of radioactivity.
- 4 Research how carbon dating works.
- 5 Discuss safety precautions when handling radioactive materials.
- 6 Explain radioactivity in your own words.