E.1 Structure of the atom

Checklist

What you should know

At the end of this subtopic you should be able to:

- Describe the Geiger—Marsden—Rutherford experiment and how it led to the discovery of the nucleus.
- Understand that photons are emitted and absorbed during atomic transitions and use the equation:

$$E = hf$$

- Understand that emission and absorption spectra provide evidence for discrete atomic energy levels and chemical composition.

Higher level (HL)

- Understand why deviations from Rutherford scattering occur and the concept of distance of closest approach.
- Understand the relationship between nucleon number and radius of a nucleus and use the equation:

$$R = R_0 A^{\frac{1}{3}}$$

- Understand that quantisation of angular momentum can explain discrete energy levels in the Bohr model for hydrogen and use the equations:

$$mvr = \frac{nh}{2\pi} \text{ and } E = -\frac{13.6}{n^2} \text{ eV}$$