Episode 520: Preparation for Rutherford scattering topic

The nuclear atom

Students will be familiar with the nuclear model of the atom, in which the atom is pictured as a miniature solar system. They may have been introduced to Rutherford scattering and how this leads to the nuclear model. Here you have the opportunity to deepen their understanding, making use of ideas about electric fields. You can also introduce them to other evidence that tells us about the size of the nucleus.

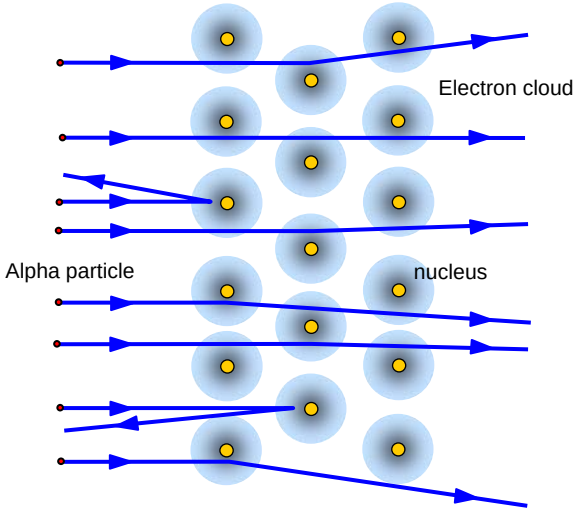
Episode 521: Rutherford's experiment

Episode 522: The size of the nucleus

Main aims

Students will:

1. Describe Rutherford's experiment and explain why it leads to the nuclear model of the atom.
2. Use Coulomb's law to estimate the size of the nucleus.
3. State the approximate sizes of atom and nucleus.



Prior knowledge

There is a lot of Physics knowledge that can contribute to this topic: collisions and momentum, Coulomb's law, and wave-particle duality.

If you have not covered all of these topics already, you will have to modify the suggested approach to take account of this.

Where this leads

Once the idea of the nuclear atom is established, you can go on to look at nuclear structure, particle accelerators, the Standard Model and the whole of particle physics.

This topic also provides a good opportunity to discuss the use of models in physics, including both mechanical and mathematical models.