**Chapter 4: Atomic Structure**

## 4.1 The Nuclear Atom

Thompson’s Model – Atoms are positively charged lumps of matter with electrons embedded in them. Disproved by Rutherford’s Alpha Scattering Experiment.

Rutherford’s Alpha Scattering Experiment:

A beam of alpha particles was directed at a thin gold foil, in front of a zinc sulphide screen. It was expected that little to no deflection would take place. It was found to be true, but a few particles were very strongly deflected, with some even coming straight back. This was surprising because alpha particles are extremely heavy and were travelling at very high speeds. The only explanation was that the atoms of the gold foil actually consisted of tiny nuclei which had all the positive charge and nearly all the mass of the atom. The rest of the atom was mostly empty space. This would explain why most alpha particles went straight through while a few were so strongly deviated. This model is known as Rutherford’s Atomic Model.

The experiment was later also used to find the unique nuclear charge of the atoms of different materials, since each material caused a different degree of deviation to the alpha particles.