Joseph John Thomson 1856–1940

Thomson was born near Manchester. His ambition was to be an engineer but instead he was awarded a scholarship in chemistry. The scholarship was in memory of John Dalton. At the age of 28, Thomson became professor at the Cavendish Laboratory, Cambridge University.

What did Thomson do?

In 1897 Thomson discovered the electron, while he was investigating the conductivity of **electricity** by gases at very low pressures. After collecting data for twenty years, **Thomson was convinced that electrons were negative particles of electricity**. He even measured the mass of the electron.

However, he still needed more evidence to convince the scientific world, so he asked Wilson to try and take a photograph of an electron. It took him until 1911 to build a suitable camera, which was sealed in a glass chamber in which electrons could be produced. The experiment was successfully carried out and the electron was photographed. JJ Thomson was worried about telling the world his new theory of the atom, because until now the atom was thought of as a single solid particle.

Thomson's model of atomic structure – 1899

1. Atoms consisted of rings of negative electrons embedded in a sphere of positive charge (the plum pudding model).

2. The positive and negative charges balance to make the atom neutral.

3. The mass of the atom was due to the nucleus.

4. The mass of an electron was 1/1840 of the mass of hydrogen, the lightest atom.

5. There were 1840 electrons in an atom of hydrogen.

Things to do

1. Make a model or draw a diagram of JJ Thomson's model of the atom.

2. What is the main difference between this new model and Dalton's model?

3. What advances in technology made it possible for Thomson to successfully complete his investigations?