

Chemistry – Unit 6 Notes

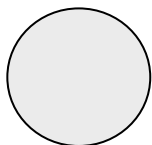
Thomson Model of the Atom

J. J. Thomson performed experiments with cathode rays in an attempt to understand electricity – which was still a mystery in the late 1800s. Review the website *A Look Inside the Atom*¹ to find the conclusions that Thomson and other physicists drew regarding the mysterious cathode rays.

Thomson's 1897 Experiments - state the conclusions Thomson drew from each of his famous cathode ray experiments:

1. **First Experiment:** Thomson directed the beam at an electrometer and tried to separate the evidence of charge from the path of the beam. *What connection did Thomson find between charge and the cathode rays? Was the charge positive or negative?*
2. **Second Experiment:** Thomson tried passing the cathode ray through an electric field. *How did cathode ray beam behave when it passed through an electric field? What did he conclude after his second experiment?*
3. **Third Experiment:** Thomson did some careful measurements on how much the path of the cathode ray was bent in a magnetic field and how much energy they carried. From this work Thomson could describe the mass/charge ratio of the cathode ray particles. *What amazing result did Thomson find?*

Thomson's Atomic Model: Thomson presented three hypotheses from his experiments. Only two were accepted by physicists – in fact the third was shown to be wrong! From the first two came a model of the atom known as the *Plum Pudding* model. Complete the atom drawing below to illustrate Thomson's plum pudding model. Explain how this fits with his observations.



¹ <http://www.aip.org/history/electron/jjhome.htm>