Chem 115 PRINCIPLES OF CHEMISTRY (Lecture)



(**1909**) **Robert Millikan** discovered the mass of the electron through his experiment of introducing charged oil droplets into an electrically charged fields.



The discovery of Nucleus

(**1911**) **Rutherford** discovered nucleus. Nucleus refers to the center of an atom, it contains protons and neutrons, and around which the electrons rotate.

(1913) Neil Bohr developed the Bohr Wheel or Rutherford-Bohr Model similar to the Solar System that is the posed of a small dense nucleus surrounded by orbiting electrons, but with the use of electrostatic forces as the attraction instead of using gravity.



Figure 10. Bohr Model (science.howstuffworks.com)

(**1911**) **Ernest Rutherford** developed the gold-foil experiment. He created an atomic model different from Thompson. He claimed that the atom was mostly empty space. It has a very small, densely positive charged nucleus (which is full of protons), and it is surrounded by electrons moving at extremely high speed.



Figure 9. Gold-foil Experiment (mubirupepu.blogspot.com)

Figure 9.1 Rutherford's Atomic Model (ehs.buncombeschools.org)

(1932) James Chadwick discovers the *Neutron*. He published a paper titled "The possible existence of a Neutron", he claimed that the evidence pointed to neutron rather than gamma ray photons as the proper explanation of the mysterious radiation. He calculated the velocity of the protons in the beams using kinematics. He was able to calculate the mass of neutral radiation using his calculations. He found that it had same mass of the proton.

