

The Structure of Atom

Joseph George

*Independent researcher, No 35, 2nd Floor, 7th Cross, B. Channasandra, Kasturinagar, Bangalore, India,
Pin 560043*

Abstract. Rutherford's Gold foil experiment has proved that an atom has a positively charged nucleus and most of the mass of an atom is concentrated in the nucleus alone. However, even though his experiment did not provide any information about the state of electrons in atoms, he proposed that, electrons are moving around the nucleus at high speed. To explain peaked absorption and emission lines produced by atoms of different elements, Bohr proposed that, electrons can travel around the nucleus only in well defined energy levels or orbitals. When an electron absorbs a photon of light, it jumps from an inner low-energy level to an outer high-energy level. He believed that an atom emits a photon of light when an electron jumps from a high-energy level to a low-energy level. Keeping in mind this motion of electrons around the nucleus, de Broglie proposed his matter wave hypothesis. Later, Davisson- Germer and G.P. Thomson performed experiments with artificially created electron beams, proved that matter in motion demonstrates a wavelike behavior, which eventually led to the development of the present wave mechanical (or atomic orbital) model of atom. But in reality, there is no experiment has ever proved that electrons are moving around the nucleus. Volume of atoms and elastic nature of atoms (e.g. gas atoms move randomly and bounce when they collide with other atoms or its container) indicate that, the nucleus of an atom is surrounded by a form of elastic matter. Since the space inside an atom is filled with this matter, we can call this matter as 'space matter'. Atom of an element produces unique emission spectrum when it is excited, and in cold state, the same atom produces absorption spectrum with exactly matching wavelengths of the emission spectrum indicate that electrons in an atom are situated in some kind of resonant columns. Since the nucleus of an atom is enveloped by space matter, we can conclude that, these resonant columns are formed by space matter. Electron configuration in an atom is determined by three factors: a) attraction from the nucleus, b) repulsion between electrons and c) force exerted by space matter, i.e. the buoyant force. Buoyant force is the only force which prevents the innermost electrons of an atom from collapsing in to the nucleus. For the electrons other than one nearest to the nucleus, buoyant force exerted by space matter and repulsion with the electrons from the inner region keep the electrons in its respective positions.