

Introduction

In nature, there are things we see with our naked eyes and also there are things we do not see. Yet, it is ironic that the things we see are composed of the things we do not see. Molecules, atoms and electrons that make up the matter belong to the latter category. Among these, electrons are the smallest particles with a mass less than trillionth of a trillionth of a gram that is immeasurable. The electrons exist in an atom outside the nucleus, which determine many of the physical and chemical properties of the matter. Therefore, it is imperative that we understand how electrons exist within atoms.

In order to observe the unobservable, usually we interact the unobservable with some kind of radiation, and analyze the emerging radiation from the unobservable system. For example, doctors can diagnose what is happening in the chest by taking the chest the x-ray. Using this concept, scientists were able to understand the behavior of electrons in atom by analyzing the emerging radiation.

There are various kinds of radiation, such as, gamma rays, X-ray, ultraviolet, visible, infrared, microwaves, and radio waves. These are known as **electromagnetic radiation or electromagnetic wave** because they emit and transmit energy in the form of electromagnetic wave that has electric field component and magnetic field components that are mutually perpendicular to one another. Electromagnetic wave, commonly known as the **speed of light**, travels 3×10^8 meters per second (186,000 miles per second) in a vacuum. This speed does not change significantly from medium to medium. The symbol c is adopted to indicate the speed of light.

There are different forms of waves come in various shapes and sizes. If you go to the beach and observe the waves coming towards the shore, you will notice each wave is different than the one that follows.

In order to understand how the electrons exists in an atom, it is essential that we understand the electromagnetic radiation.
