

Vocabulary: Bohr Model of Hydrogen

Vocabulary

- Absorption spectrum – a spectrum that contains dark lines superimposed on a bright continuous spectrum; also called a *dark-line spectrum*.



Absorption spectrum

- An absorption spectrum is created when light passes through a group of atoms.
 - Some of the wavelengths of light are absorbed by electrons in the atoms, causing the electrons to move to higher *energy levels*.
 - These wavelengths appear as dark bands in the resulting absorption spectrum.
 - Light that is not absorbed by the atoms makes up the bright part of the spectrum.
- Bohr model – a model of the atom that depicts a small, positively charged nucleus surrounded by electrons moving in discrete circular orbits.
 - The radius of each electron orbit in the Bohr model is determined by the energy of the electron in that orbit. Only specific energies (and thus specific *orbit radii*) are allowed.
 - An electron may jump from one orbit to another but will not pass through the space between orbits. The jump is called a *quantum leap*.
 - Although the Bohr model has been replaced by the *quantum mechanical* atomic model, it is useful for studying basic concepts in quantum physics.
- Electron volt – a unit of energy that is equal to the energy of an electron that is accelerated by a potential difference of 1 volt.
 - Electron volts are used to describe the energy an electron gains or loses as it moves from one orbit to another.
 - Electron volts also are used to describe the energies of *photons*.
- Emission spectrum – a spectrum of colored lines on a dark background; also called a *bright-line spectrum*.



Emission spectrum

- An emission spectrum is created when an element or elements emit light at certain wavelengths.
- In astronomy, emission spectra are usually associated with nebulae.

- Energy level – an allowed energy for an electron orbiting the nucleus.
 - Each energy level corresponds to a specific orbit or group of orbits. These groups of orbits are known as *electron shells*.
- Ionization energy – the minimum energy required to remove an electron from an atom.
- Laser – a device that emits a concentrated beam of light with a single wavelength and direction.
 - LASER is an acronym for *light amplification by stimulated emission of radiation*.
 - Unlike light from other sources, the beam of light from a laser does not spread out as it moves away from its source.
- Orbit – The theoretical circular path of an electron around the nucleus in the Bohr model of an atom.
 - In the quantum mechanical atomic model, electrons do not have specific orbits or even specific locations. Instead, their likely location is described by an “electron cloud.” The electron cloud shows the probability that an electron will be found in a given location.
- Photon – the smallest possible amount of light; a *quantum* of light.
 - A photon can behave as a discrete particle or as a wave.
 - Photons are distinguished by their wavelengths. The shorter the wavelength, the greater the energy a photon carries.

