

Chapter 7 Quantum Theory and Atomic Structure

This chapter shows how physics concepts are important to understanding chemistry. The behavior of atoms can be understood as resulting from the behavior of their electrons. Electrons in atoms are studied by using absorption or emission of electromagnetic radiation (photons) which has a characteristic wavelength or frequency. The relationship between the wavelength (λ) and the frequency (ν) of the wave as well as the energy of the wave is explained as well as the concept of a photon, emission, absorption spectra, and the calculation of the energy involved in electronic transitions in atoms. This leads to quantum theory: the idea that electrons have specific, restricted energy levels in atoms, characterized by a set of quantum numbers (principal quantum number, an angular momentum number, and a magnetic number). The photoelectric effect, orbital shapes, and wave particle duality are also AP content found in this chapter.