Atomic Structure

1. Identify the conceptual advancement that lead to each step in the progression of the model of the atom.
   a. Billiard Ball to Plum Pudding

   b. Plum Pudding to Solar System (nuclear model)

   c. Solar System to Bohr model

   d. Bohr Model to deBroglie

   e. deBroglie to Schrodinger

2. The energy of a photon determines the frequency by the equation *E* = *hf* where h is Planck's constant (h=6.63x10^{-34} J s).
   a. Calculate the frequency if there is a 10 eV photon.

   b. Calculate the wavelength of the photon.

3. Suppose there is an energy level transition from -4 eV to -10 eV energy levels in an atom.
   a. Calculate the frequency of the emitted photon.

   b. Determine the wavelength of the photon.

   c. Identify where the photon belongs on the EM spectrum.

4. The Bohr model of the hydrogen atom includes allowable energy levels defined by E = -(13.6/n^2) eV, where n is a whole number.
   a. Determine the wavelengths of the photons emitted during the allowable energy level changes within levels 2, 3 and 4.

   b. Identify where these photons would appear on the e-m spectrum.

5. What frequency of light would be required to completely remove an electron from the ground state of a hydrogen atom?

6. The Bohr radius is approximately 5.29 x 10^{-11} m. Using the wave concepts that of deBroglie, determine:
   a. the resonance wavelength of an electron.

   b. the wavelengths for levels 2 and 3.