

**Homework #4**  
**(Particle Model of Light; Bohr Model of Hydrogen Atom)**  
**CHEM 11 (S 2016, LAC)**  
(Due Friday, February 26)

**Note:** You must show your work where appropriate; correct answers by themselves do not get credit. Also remember to apply significant digits to round your answers appropriately.

1. What is the energy (in Joules and eVs) of a photo having a wavelength of 622.5 nm?
2. The so-called microwave background radiation which satellites have observed throughout the universe has energy of 230  $\mu\text{eV}$ . What is the frequency and wavelength of this light?
3. Using the equations from Bohr's model of the hydrogen atom, calculate the radius and the energy of the  $n=2$  and  $n=6$  orbits.
4. Find the wavelength of light emitted when an electron moves from the  $n=6$  level to the  $n=2$  level in hydrogen. Begin by calculating the energy difference between these two states and then finding the frequency and wavelength of the photon emitted.
5. When an electron moves from a particular higher energy state to the  $n=4$  state, a photon with the wavelength of 2166 nm is produced. What was the beginning state for this electron?