CHEMISTRY I

Wavelength (λ), Frequency (υ) and Energy (E) Worksheet

1. A certain violet light has a wavelength of 4.13×10^{-7} m.
   a. What is the frequency of this light?

   b. What is the energy of this light?

2. a. What is the energy of a quantum of light that has a frequency of 4.31×10^{14} Hz?

   b. What is the wavelength of this light?

3. A green light has a frequency of 6.26×10^{14} Hz.
   a. What is the wavelength of this light?

   b. What is the energy of this light?

4. What is the energy of a light with a wavelength of 7.94×10^{-7} m?

5. a. What is the energy of a photon of microwave radiation with a frequency of 4.69×10^{11} Hz?

   b. What is the wavelength of this radiation?

6. Suppose your favorite AM radio station broadcasts at a frequency of 1150 kHz. What is the wavelength of the radiation from the radio station in ***centimeters***?

7. A Mercury (Hg) lamp emits radiation with a wavelength of 4.36×10^{-7} m.
   a. What is the frequency of this radiation?

   b. What is the energy of this radiation?

   c. In what region of the electromagnetic spectrum will this radiation be found?

8. a. Calculate the energy of a photon of red light with a wavelength of 6.45×10^{-5} cm.

   b. What is the frequency of this red light?

9. a. Calculate the energy of a photon of green light with a frequency of 5.80×10^{14} Hz.

   b. Which light has more energy: the red light in question #8 or the green light on question #9?

$$E = h(\nu)$$

$$\lambda(\nu) = c$$

$$c = 3.0 \times 10^{8} \text{ m/s} \quad \text{or} \quad 3.0 \times 10^{10} \text{ cm/s}$$

$$h = 6.626 \times 10^{-34} \text{ Joules/Hz}$$