**HomeWork 17: Chem 1114**

**Due Wednesday 11/16/16**

**Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_/5**

**Given: Planck’s Law: energy/ photon = E(J)/photon = hf = hc/λ**

 **Wave Equation: f\*λ=c**

 **h=6.634\*10-34 J\*s**

 **c=3\*108 m/s**

 **hc= 1.989\*10-25 J\*m**

**1. If f=3.0148\*1013 Hz, what is the energy of a photon ? \_\_\_\_2\*10-20\_\_\_\_\_ J**

**E(J)=6.634\*10-34 J .s\*3.0148\*1013/s=2\*10-20 J**

**2. If λ = 9.945\*10‑6 m, what is the energy of a photon ? \_\_\_2\*10-20\_\_\_\_\_ J**

**E(J)=1.989\*10-25/λ= 1.989\*10-25/9.945\*10-6 =2\*10‑20 J**

**3. If E/photon= 6.63\*10‑19 J, what is the wavelength of the photon ?**

 **E=6.63\* 10-19= 1.989\*10-25/λ**

 **λ= 1.989\*10-25/6.63\*10-19=3\*10-7**

 **\_\_3\*10-7\_\_\_\_=λ(m)**

**4. A photon with a frequency of 1.5\*1014 Hz is equivalent to what wavelength?**

 **fλ=c=3\*108 m/s**

 **λ=3\*108/f=3\*108/1.5\*1014 =2\*10-6**

 **\_\_2\*10-6\_\_\_=λ(m)**

**5. What is the energy of a photon with f=1.2059\*1014 Hz ? \_\_8\*10-20\_\_J**

**E(J)/photon = hf=6.634\*10-34 \*1.2059\*1014=8\*10‑20**