

$$E = h\nu \quad c = \lambda\nu \quad c = 3.00 \times 10^8 \quad h = 6.626 \times 10^{-34} \text{ J}\cdot\text{sec}$$

Answer only 1 of the 2 questions below

1. What is the wavelength of a photon if the energy for the light is 192.7 KJ/ mol

$$\frac{192.7 \text{ KJ}}{1 \text{ mole}} \times \frac{1 \times 10^3 \text{ J}}{1 \text{ KJ}} \times \frac{1 \text{ mole}}{6.022 \times 10^{23} \text{ photons}} = 3.200 \times 10^{-19} \text{ J/photon}$$

$$E = \frac{hc}{\lambda} \quad 3.200 \times 10^{-19} \text{ J/photon} = \frac{(6.626 \times 10^{-34} \text{ J}\cdot\text{sec})(3.00 \times 10^8 \text{ m/sec})}{\lambda}$$

$$\lambda = 621.2 \text{ nm}$$

2. If the threshold frequency of Cesium metal is  $5.15 \times 10^{14}$  HZ, What will be the kinetic energy of an electron ejected from The Cesium surface if it is irradiated with a photon with a wavelength of 275 nm?

$$\text{Total Energy} = \text{Binding Energy} + \text{Kinetic Energy}$$

$$\text{Kinetic Energy} = \text{Total Energy} - \text{Binding Energy}$$

$$= \frac{hc}{\lambda} - h\nu = \frac{(6.626 \times 10^{-34} \text{ J}\cdot\text{sec})(3.00 \times 10^8 \text{ m/sec})}{2.75 \times 10^{-7} \text{ m}} - (6.626 \times 10^{-34} \text{ J}\cdot\text{sec})(5.15 \times 10^{14} \text{ Hz})$$

$$\text{Kinetic energy} = 3.82 \times 10^{-19} \text{ J}$$