Quiz 10 (10 points) **Chemistry 111** **Name** answers
Dr. Taylor **Spring 2012** **First AND Last**

$E = h\nu$ $C = \lambda\nu$ $C = 3.00 \times 10^{8}$ $h = 6.626 \times 10^{-34}$ J*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

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

$$E = \frac{hC}{\lambda} \qquad 3.200 \times 10^{-19}\ J/photon = \frac{(6.626 \times 10^{-34}\ J*sec)(3.00 \times 10^{8}\ m/sec)}{\lambda}$$

$$\lambda = 621.2\ nm$$

2. If the threshold frequency of Cesium metal is 5.15×10^{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?

Total Energy = Binding Energy + Kinetic Energy

Kinetic Energy = Total Energy - Binding Energy

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

Kinetic energy = 3.82×10^{-19} J