

NAME _____

PERIOD _____

PHYSICS HOMEWORK QUIZ #21D

PARTICLE PROPERTIES OF LIGHT

Monochromatic light is shined upon a metal surface which has a work function of $f = 13.40$ eV. The resulting photoelectrons are measured to have a wavelength of 110 A. [$1\text{eV} = 1.6 \times 10^{-19}$ J, $h = 6.63 \times 10^{-34}$ J sec, $c = 3.0 \times 10^8$ m/sec, $m_e = 9.11 \times 10^{-31}$ kg]

1. What will be the momentum of the emitted photoelectrons ? [5 pts]
2. What will be the kinetic energy of the emitted photoelectrons ? [5 pts]
3. What was the energy of the incoming light photon ? [5 pts]
4. What was the wavelength of the incoming light photon ? [5 pts]
5. What was the momentum of the incoming light photon ? [5 pts]
6. What frequency of light will just barely be able to free an electron from this surface ? [5 pts]