Chapter 41   Light as a Particle (Examples) (SM03)

Example 1: What is the maximum wavelength photon that will cause photoelectric electrons to be emitted from a surface whose work function is 6 eV?

Example 2: If 400 nm light illuminates a surface whose work function is 2 eV, what is the electron's maximum kinetic energy?

Example 3: The threshold wavelength for gold is 257.3 nm. What is the work function in eV?

Example 4: If a gold surface is illuminated by 100 nm light, what is the stopping potential?

Example 5: At what speed will an electron have the same momentum as a 2 eV and as a 2 MeV photon?

Example 6: A photon collides with an electron. Calculate the Compton shift for a 90° scattering angle for a 400 nm and then a 0.4 nm photon.

Example 7: A 0.3 nm x ray collides with an electron. The scattering angle is 120°. What is the kinetic energy of the scattered electron.

Example 8: If the maximum energy given to an electron during Compton scattering is 100 keV, what is the wavelength of the incident photon?