Photoelectricity

1. The wavelength of the photoelectric threshold for silver is $325\,\mathrm{nm}$. Find the velocity of electrons ejected from a silver surface by ultraviolet light of wavelength $253.6\,\mathrm{nm}$. $(6.15 \times 10^5\,\mathrm{ms}^{-1})$

2. The maximum kinetic energy of photoelectrons is 4×10^{-19} J when light of wavelength $300\,\mathrm{nm}$ falls on the surface of a metal. Find the stopping potential and the threshold wavelength for this metal. $(2.5\,\mathrm{V},\ 757\,\mathrm{nm})$

3. Potassium is illuminated with ultraviolet light of wavelength $250\,\mathrm{nm}$. If the work function of potassium is $2.21\,\mathrm{eV}$, what is the maximum kinetic energy of the emitted electrons? $(2.76\,\mathrm{eV})$

4. Find the work function of potassium if the largest wavelength for electron emission in a photo electric experiment is $562\,\mathrm{nm}$. $(2.21\,\mathrm{eV})$

5. The maximum wavelength to eject photoelectrons off a certain metal is $325.6\,\mathrm{nm}$. If it is illuminated with light of wavelength $258.9\,\mathrm{nm}$, then what is the required stopping potential? $(-0.98\,\mathrm{V})$

6. The maximum energy of emitted photoelectrons, when a metal is illuminated with light of wavelength 3000Å, is $1.2\,\mathrm{eV}$. Find the work function of the metal. $(2.94\,\mathrm{eV})$

7. The maximum wavelength for photoelectric emission in tungsten is $230\,\mathrm{nm}$. What wavelength of light will help eject electrons with a maximum energy of $1.5\,\mathrm{eV}$? $(180\,\mathrm{nm})$

8. What is the maximum wavelength of light that will help emit photoelectrons from a metal? What is the maximum kinetic energy of the electrons if $180\,\mathrm{nm}$ light falls on the metal? (Work function of the metal is $2.3\,\mathrm{eV}$). $(540\,\mathrm{nm},\ 4.6\,\mathrm{eV})$

9. The minimum frequency for photoelectric emission in copper is $1.1 \times 10^{15}\,\mathrm{Hz}$. Find the maximum energy of the electrons (in eV) when light of frequency $1.5 \times 10^{15}\,\mathrm{Hz}$ is directed on a copper surface. $(1.7\,\mathrm{eV})$

10. What is the maximum wavelength of light that will help emit photoelectrons from sodium? What is the maximum kinetic energy of the electrons if $200\,\mathrm{nm}$ light falls on sodium? (Work function of sodium is $2.3\,\mathrm{eV}$). $(3.91\,\mathrm{eV})$

11. Light of wavelength $400\,\mathrm{nm}$ is incident on a metal surface whose work function is $2.5\,\mathrm{eV}$. Find the stopping potential and the speed of the fastest photoelectrons. $(0.6\,\mathrm{eV},\ 4.6 \times 10^5\,\mathrm{ms}^{-1})$

12. A metal surface illuminated with light of frequency $8.5 \times 10^{14}\,\mathrm{Hz}$ emits electrons with maximum energy $0.52\,\mathrm{eV}$. When light of frequency $12.0 \times 10^{14}\,\mathrm{Hz}$ is used, then the maximum energy is $1.97\,\mathrm{eV}$. Find Planck's constant and the work function of the metal. $(6.63 \times 10^{-34}\,\mathrm{Js},\ 3\,\mathrm{eV})$