

# Photoelectric Effect Drills

- 1 Nickel has a work function of 5.01 eV. What is the maximum kinetic energy of the ejected electrons if the metal is illuminated at  $9.23 \times 10^{14}$  Hz?
- 2 Light of frequency  $1.20 \times 10^{15}$  Hz ejects electrons with a maximum kinetic energy of  $1.04 \times 10^{-19}$  J. What is the work function of the metal?
- 3 Light of wavelength  $2.58 \times 10^{-7}$  m ejects electrons with a maximum speed of  $1.68 \times 10^5$  m/s. What is the work function of the metal?
- 4 Zinc has a work function of 4.30 eV. What is the maximum speed of the ejected electrons if the metal is illuminated at  $2.80 \times 10^7$  m?
- 5 Cadmium has a work function of 4.07 eV. What frequency of light will eject electrons with a maximum speed of  $3.79 \times 10^5$  m/s?
- 6 The work function of a metal is 4.70 eV. What is its threshold frequency?
- 7 Light of wavelength  $2.56 \times 10^{-7}$  m ejects electrons with a maximum speed of  $1.28 \times 10^5$  m/s. What is the work function of the metal?
- 8 Light of frequency  $1.09 \times 10^{15}$  Hz ejects electrons with a maximum kinetic energy of  $6.65 \times 10^{-20}$  J. What is the work function of the metal?
- 9 The threshold frequency of a metal is  $1.53 \times 10^{15}$  Hz. What is its work function?
- 10 Light of wavelength  $2.82 \times 10^{-7}$  m ejects electrons with a maximum speed of  $5.06 \times 10^5$  m/s. What is the work function of the metal?
- 11 Cadmium has a work function of 4.07 eV. What wavelength of light will eject electrons with a maximum kinetic energy of  $6.01 \times 10^{-20}$  J?
- 12 Light of frequency  $6.18 \times 10^{14}$  Hz ejects electrons with a maximum kinetic energy of  $7.35 \times 10^{-20}$  J. What is the work function of the metal?
- 13 Copper has a work function of 4.70 eV. What wavelength of light will eject electrons with a maximum kinetic energy of  $2.32 \times 10^{-20}$  J?

$$h = 6.626 \times 10^{-34} = 6.626 \times 10^{-34}$$

## Answers:

1. No electrons are emitted. 2. 4.30 eV 3. 4.73 eV 4.  $2.18 \times 10^5$  m/s 5.  $1.08 \times 10^{15}$  Hz 6.  $1.13 \times 10^{15}$  Hz 7. 4.81 eV 8. 4.08 eV 9. 6.35 eV 10. 3.68 eV 11.  $2.79 \times 10^{-7}$  m 12. 2.10 eV 13.  $2.56 \times 10^{-7}$  m