

# Photoelectric Effect Drills

- 1 The threshold frequency of a metal is  $1.21 \times 10^{15}$  Hz. What is its work function?
- 2 Light of wavelength  $2.57 \times 10^{-7}$  m ejects electrons with a maximum speed of  $2.10 \times 10^5$  m/s. What is the work function of the metal?
- 3 Light of frequency  $1.12 \times 10^{15}$  Hz ejects electrons with a maximum kinetic energy of  $2.27 \times 10^{-20}$  J. What is the work function of the metal?
- 4 Light of frequency  $1.17 \times 10^{15}$  Hz ejects electrons with a maximum kinetic energy of  $1.14 \times 10^{-19}$  J. What is the work function of the metal?
- 5 Light of wavelength  $2.61 \times 10^{-7}$  m ejects electrons with a maximum speed of  $9.15 \times 10^4$  m/s. What is the work function of the metal?
- 6 Zinc has a work function of 4.30 eV. What is the maximum kinetic energy of the ejected electrons if the metal is illuminated at  $1.09 \times 10^{15}$  Hz?
- 7 The threshold frequency of a metal is  $1.09 \times 10^{15}$  Hz. What is its work function?
- 8 Calcium has a work function of 2.90 eV. What is the maximum speed of the ejected electrons if the metal is illuminated at  $3.06 \times 10^{-7}$  m?
- 9 Platinum has a work function of 6.35 eV. What is the threshold frequency?
- 10 Mercury has a work function of 4.50 eV. What is the maximum kinetic energy of the ejected electrons if the metal is illuminated at  $1.11 \times 10^{15}$  Hz?
- 11 The work function of a metal is 4.07 eV. What is its threshold frequency?
- 12 Uranium has a work function of 3.60 eV. What wavelength of light will eject electrons with a maximum kinetic energy of  $1.23 \times 10^{-19}$  J?
- 13 Niobium has a work function of 4.30 eV. What is the maximum kinetic energy of the ejected electrons if the metal is illuminated at  $1.09 \times 10^{15}$  Hz?

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

## Answers:

1. 5.01 eV 2. 4.70 eV 3. 4.50 eV 4. 4.14 eV 5. 4.73 eV 6.  $3.09 \times 10^{-20}$  J 7. 4.50 eV 8.  $6.40 \times 10^5$  m/s 9.  $1.53 \times 10^{15}$  Hz 10.  $1.43 \times 10^{-20}$  J 11.  $9.83 \times 10^{14}$  Hz 12.  $2.84 \times 10^{-7}$  m 13.  $3.56 \times 10^{-20}$  J