

- 7 An explanation of the photoelectric effect includes the terms photon energy and work function energy.

(a) Explain what is meant by

(i) a photon,

.....

[2]

(ii) work function energy.

.....

[1]

- (b) In an experiment to investigate the photoelectric effect, a student measures the wavelength λ of the light incident on a metal surface and the maximum kinetic energy E_{\max} of the emitted electrons. The variation with E_{\max} of $\frac{1}{\lambda}$ is shown in Fig. 7.1.

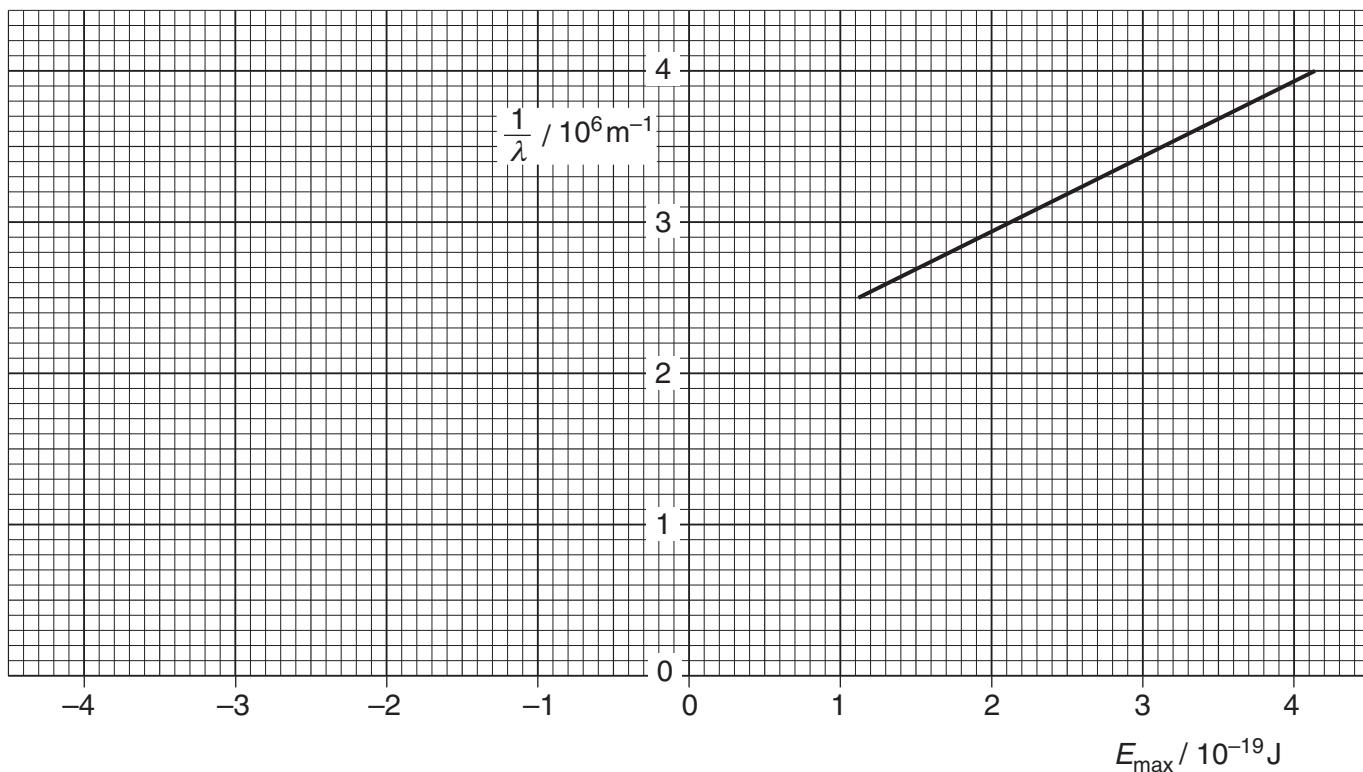


Fig. 7.1

(i) The work function energy of the metal surface is Φ .

State an equation, in terms of λ , Φ and E_{\max} , to represent conservation of energy for the photoelectric effect. Explain any other symbols you use.

.....

[2]

(ii) Use your answer in (i) and Fig. 7.1 to determine

1. the work function energy Φ of the metal surface,

$$\Phi = \dots \text{ J} [2]$$

2. a value for the Planck constant.

$$\text{Planck constant} = \dots \text{ Js} [3]$$