

- 8 The maximum kinetic energy E_{MAX} of electrons emitted from a metal surface is determined for different wavelengths λ of the electromagnetic radiation incident on the surface.

The variation with $\frac{1}{\lambda}$ of E_{MAX} is shown in Fig. 8.1.

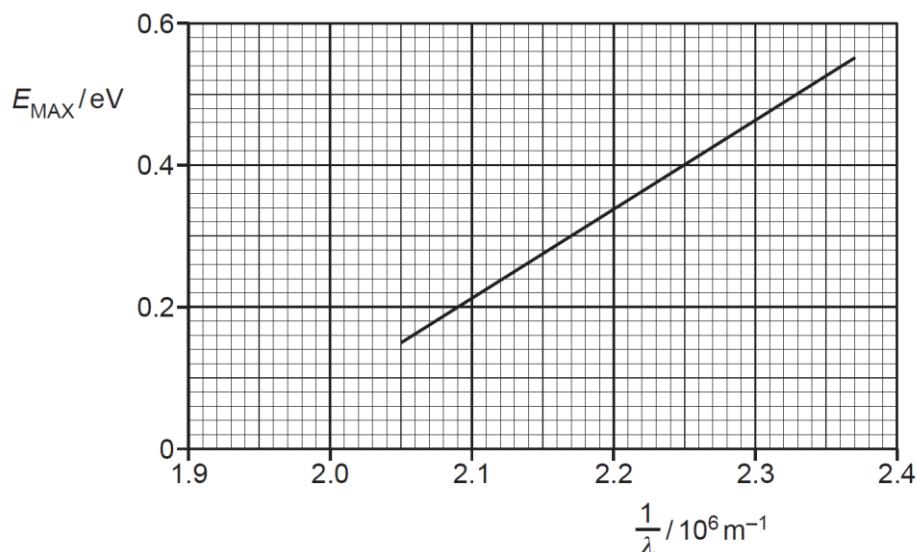


Fig. 8.1

- (a) Use the gradient of the line on Fig. 8.1 to determine a value for the Planck constant h .

Explain your working.

$$h = \dots \text{ J s} [3]$$

- (b) The electromagnetic radiation is now incident on a metal with a larger work function energy than the metal in (a).

On Fig. 8.1, sketch the variation with $\frac{1}{\lambda}$ of E_{MAX} . Label this line X. [1]

- (c) The work function energy in eV for some metals is given in Table 8.1.

Table 8.1

metal	work function/eV
tungsten	4.49
magnesium	3.68
potassium	2.40

Determine the metal used in the experiment. Show your working.

..... [3]

- (d) The intensity of the electromagnetic radiation for one particular frequency is increased.

State and explain the change, if any, in the rate of emission of photoelectrons.

..... [1]