


A Level • OCR • Physics

 4 mins 4 questions

Multiple Choice Questions

The Photoelectric Effect

The Photoelectric Effect / Demonstrating the Photoelectric Effect / The Photoelectric Equation / Work Function & Threshold Frequency / Maximum Kinetic Energy & Intensity

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Total Marks

/4

- 1 Electromagnetic radiation is incident on a metal of work function 2.3 eV.

The maximum kinetic energy (KE) of the photoelectrons is 1.7 eV.

The frequency of this incident electromagnetic radiation is kept the same but its intensity is doubled.

What is the maximum KE of the photoelectrons now?

- A. 1.7 eV
- B. 2.9 eV
- C. 3.4 eV
- D. 4.0 eV

(1 mark)

- 2 Visible light is incident on a metal. The radiation has a constant wavelength with each photon having an energy of 10.0 eV. The work function of the metal is 2.0 eV.

What is the maximum kinetic energy (J) of the photoelectron?

- A. 1.28×10^{-18}
- B. 1.6×10^{-18}
- C. 1.92×10^{-18}
- D. 3.9×10^{-18}

(1 mark)

- 3 A beam of X-rays with an energy of 5.8×10^{-19} J incident on a metal surface with a work function of 4.2×10^{-19} J.

What is the maximum speed (m s^{-1}) of emitted electrons?

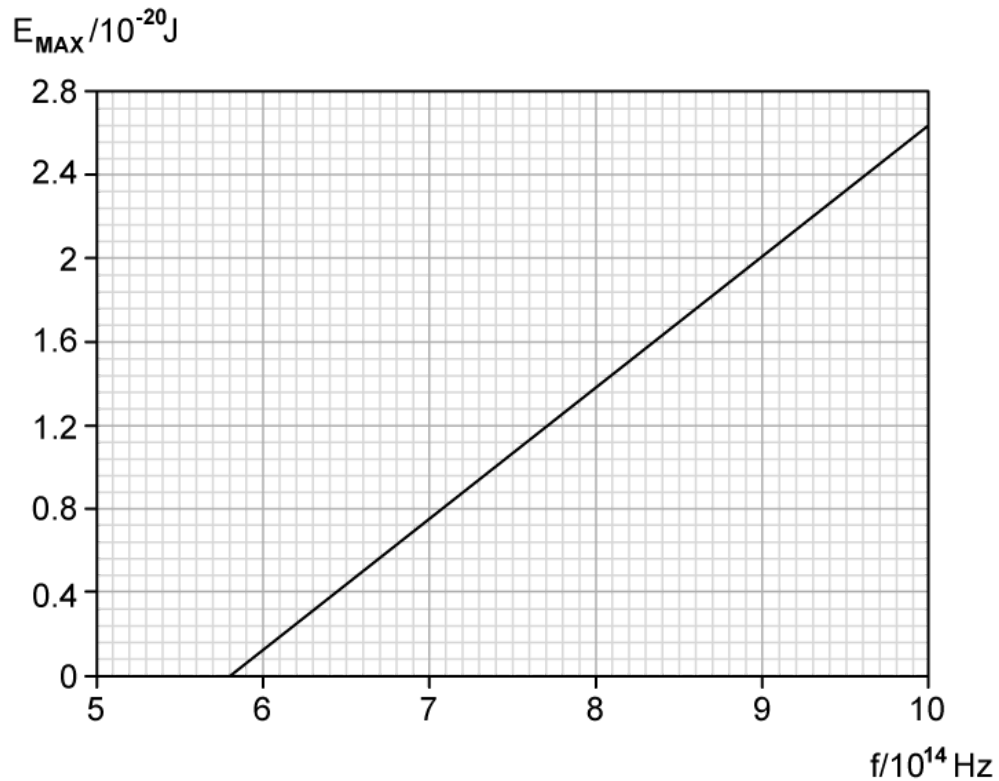
- A. 5.9×10^5
- B. 9.4×10^5
- C. 1.2×10^6
- D. 1.3×10^6

(1 mark)

- 4 In a research experiment, a beam of electromagnetic radiation is incident on a clean metal surface. The purpose of the experiment is to find the work function energy (ϕ).

The results in Figure 3 show the variation with frequency f of the maximum kinetic energy E_{MAX} of electrons emitted from the surface.

Figure 3



What is the work function energy in J of the metal used in the experiment?

- A.** 3.9×10^{-19}
- B.** 4.9×10^{-19}
- C.** 5.9×10^{-19}
- D.** 6.9×10^{-19}

(1 mark)