

4. The photoelectric cut-off voltage in a certain experiment is 1.5 V. What is the maximum kinetic energy of photoelectrons emitted?

Sol. Photoelectric cut-off voltage, $v_0 = 1.5 \text{ v}$

The maximum kinetic energy of the emitted photoelectrons is given as;

$$K_e = eV_0$$

Where,

$$e = \text{Charge on an electron} = 1.6 \times 10^{-19} \text{ C}$$

$$\begin{aligned} \therefore K_e &= 1.6 \times 10^{-19} \times 1.5 \\ &= 2.4 \times 10^{-19} \text{ J} \end{aligned}$$

Therefore, the maximum kinetic energy of the photoelectrons emitted in the given experiment is $2.4 \times 10^{-19} \text{ J}$