

36. The kinetic energy gained by the electron is eV , where V is the accelerating potential difference. A photon with the minimum wavelength (which, because of $E = hc/\lambda$, corresponds to maximum photon energy) is produced when all of the electron's kinetic energy goes to a single photon in an event of the kind depicted in Fig. 41-15. Thus, using the result of problem 3 in Chapter 39,

$$eV = \frac{hc}{\lambda_{\min}} = \frac{1240 \text{ eV} \cdot \text{nm}}{0.10 \text{ nm}} = 1.24 \times 10^4 \text{ eV} .$$

Therefore, the accelerating potential difference is $V = 1.24 \times 10^4 \text{ V} = 12.4 \text{ kV}$.