Chapter 34   Problem 30 [†]

Given
$\lambda = 1\ mm = 1.0 \times 10^{-3}\ m$
$m_e = 9.11 \times 10^{-31}\ kg$
$h = 6.63 \times 10^{-34}\ J \cdot s$

Solution
Find the speed of the electron that gives a wavelength of $1\ mm$.

The De Broglie wavelength is given by

$$\lambda = \frac{h}{p} = \frac{h}{m \cdot v}$$

Solving for velocity gives

$$v = \frac{h}{m \cdot \lambda}$$

Substituting in the provided values gives

$$v = \frac{6.63 \times 10^{-34}\ J \cdot s}{(9.11 \times 10^{-31}\ kg) \cdot (1.0 \times 10^{-3}\ m)} = 0.728\ m/s$$