

3. To estimate the energy, we use Eq. 40-4, with $n = 1$, L equal to the atomic diameter, and m equal to the mass of an electron:

$$E = n^2 \frac{h^2}{8mL^2} = \frac{(1)^2 (6.63 \times 10^{-34} \text{ J}\cdot\text{s})^2}{8(9.11 \times 10^{-31} \text{ kg})(1.4 \times 10^{-14} \text{ m})^2} = 3.07 \times 10^{-10} \text{ J} = 1920 \text{ MeV} .$$