HW 9-2 Soln)

From the Bohr atom derivation, we have that

$$K_n = -E_n = -\frac{-13.6 \text{ eV}}{n^2}$$

$$K_2 = -E_2 = \frac{13.6 \text{ eV}}{2^2} = 3.4 \text{ eV} = 5.4 \times 10^{-19} \text{ Joules} \ .$$

Using Newtonian physics,

$$v = \sqrt{\frac{2K}{m}} = \sqrt{\frac{2(5.4 \times 10^{-19})}{9.11 \times 10^{-31}}} = 1.1 \times 10^6 \text{ m/s} \ ,$$

which is about 0.4% of the speed of light, so a Newtonian approach is probably O.K. to determine this speed.