

$$E_n = \frac{-me^4}{32\pi^2\epsilon_0^2\hbar^2} \frac{1}{n^2} = -\frac{13.6}{n^2} \text{ eV}$$

$$E_3 = -\frac{13.6}{9} \text{ eV} = K + U$$

From 6.26 $K = \frac{1}{8\pi\epsilon_0} \frac{e^2}{r}$

6.27 $U = -\frac{1}{4\pi\epsilon_0} \frac{e^2}{r}$

so $U = -2K$

$$-\frac{13.6}{9} \text{ eV} = -K$$

$$K = \frac{13.6}{9} \text{ eV} = \frac{1}{2}mv^2 \Rightarrow K = 1.51 \text{ eV}$$

$$V = \sqrt{\frac{\left(\frac{2}{9} 13.6 \text{ eV}\right)}{m}} = \sqrt{\frac{2 \cdot 13.6 \text{ eV}}{9 \cdot 5.11 \times 10^5 \text{ eV}/c^2}}$$

$$\begin{aligned} U &= -\frac{2}{9} 13.6 \text{ eV} \\ &= 0.00243 \text{ eV} \\ &= 729,000 \text{ m/s} \end{aligned}$$

$$U = -2K = -3.02 \text{ eV}$$