

$$m = 1.67 \times 10^{-27} \text{ kg}$$

$$t = 2.0 \times 10^{-4} \text{ sec}$$

$$r = 1.0 \text{ km} = 1000 \text{ m}$$

$$a) \quad v_t = \frac{d}{t} = \frac{2\pi r}{t}$$

$$= \frac{2(\pi)(1000 \text{ m})}{(2 \times 10^{-4} \text{ sec})}$$

$$v_t = 3.14 \times 10^7 \text{ m/s}$$

$$b) \quad a_c = \frac{v_t^2}{r} = \frac{(3.14 \times 10^7 \text{ m/s})^2}{(1000 \text{ m})}$$

$$a_c = 9.87 \times 10^{11} \text{ m/s}^2$$