

1. $K+U = \frac{1}{2} m_e v^2 + qV$
 $U = qV$
 $V = \text{potential diff} = 115 \text{ Volts}$
 $K = 7.37 \times 10^{-17} \text{ J}$

$q = Q = \text{Ion charge} = ?$
 $K+U = 7.37 \times 10^{-17} \text{ J} + q \cdot 115 \text{ Volts} = \text{Constant}$

$$q = \frac{-7.37 \times 10^{-17} \text{ J} + \text{Constant}}{115 \text{ Volts}}$$

2. $v_0 = 0 \text{ m/s}$ Uniform - $E\text{-field} = 5.90 \times 10^5 \text{ V/m}$
How fast @ 1cm

$$a = \frac{qE}{m}$$

$$F = 5.90 \times 10^5 \frac{\text{V}}{\text{m}} \times (-1.60 \times 10^{-19} \text{ C})$$

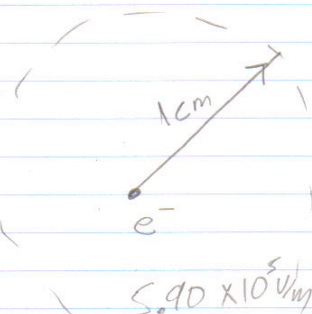
$$F = 9.44 \times 10^{-14}$$

$$m_e = 9.11 \times 10^{-31} \text{ kg}$$

$$e^- = -1.60 \times 10^{-19} \text{ C}$$

$$a = \frac{F}{m}$$

$$a = \frac{9.44 \times 10^{-14} \text{ Newton}}{9.11 \times 10^{-31} \text{ kg}} = 1.036 \times 10^{17} \frac{\text{N}}{\text{kg}}$$



$$V^2 = 2a(\Delta x)$$

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$$= \sqrt{2 \times 1.036 \times 10^{17} \frac{\text{N}}{\text{kg}} \cdot (0.01 \text{ m} - 0 \text{ m})}$$

$$= 2.072 \times 10^7 \text{ m/s}$$