P #B

Ch 16- Worksheet

a) $V_i = 0$ m/s
$\Delta V = 120$ V
$q = \pm 1.6 \times 10^{-19}$ C

Find Work: $W = \Delta PE = q \cdot \Delta V$

$W = (1.6 \times 10^{-19}\text{ C})(120\text{ V})$

$= 1.92 \times 10^{-17}$ J

Find v:

$KE = W = 1.92 \times 10^{-17}$ J
$m = 1.67 \times 10^{-27}$ kg

$KE = \frac{1}{2} \cdot m \cdot v^2$

so $(1.92 \times 10^{-17}\text{ J}) = \frac{1}{2}(1.67 \times 10^{-27}\text{ kg}) \cdot v^2$

$\boxed{v = 1.52 \times 10^5 \text{ m/s}}$

b) $KE = 1.92 \times 10^{-17}$ J (same as for proton)
$m = 9.11 \times 10^{-31}$ kg

$KE = \frac{1}{2} \cdot m \cdot v^2$ so $(1.92 \times 10^{-17}\text{ J}) = \frac{1}{2}(9.11 \times 10^{-31}\text{ kg}) \cdot v^2$

$\boxed{v = 6.49 \times 10^6 \text{ m/s}}$