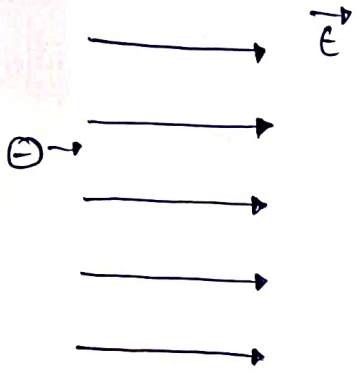
An electron is traveling at 1.8×10^6 m/s when it enters an electric field that slows it. The field has a magnitude of 6200 N/C. How far does the electron penetrate the field before it stops.



electron mass = 9.1×10^{-31} kg

electron charge = 1.6×10^{-19} C

$$K.E = \frac{1}{2} mv^2$$

$$= \frac{1}{2} (9.11 \times 10^{-31} \text{ kg}) (1.8 \times 10^6 \text{ m/s})^2$$

$$= 1.476 \times 10^{-18} \text{ J}$$

$$F = q \cdot E$$

$$= 1.6 \times 10^{-19} \text{ C} \cdot 6200 \text{ N/C}$$

$$= 9.92 \times 10^{-16} \text{ N}$$

work = force × distance

Q. wday
B-6

$$d = \frac{W}{F}$$

$$d = \frac{1.476 \times 10^{-18}\ J}{9.92 \times 10^{-16}\ N}$$

$$= 0.0015\ m$$