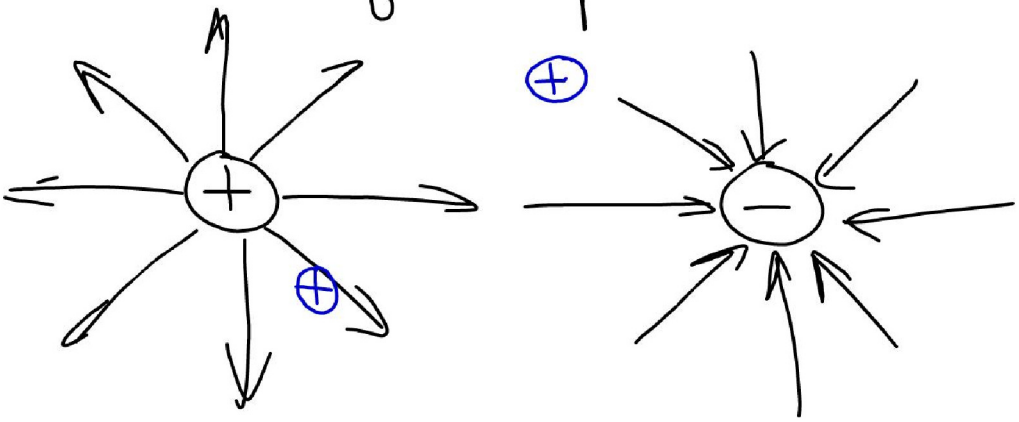
$$\vec{E} = \frac{F}{q} = \frac{kq}{r^2}$$



$$k = \frac{1}{4\pi\varepsilon_0} = 9\times10^9 \frac{N m^2}{C^2}$$

$$\varepsilon_0 = 8.85\times10^{-12} \frac{C^2}{N\cdot m^2}$$

q = charge (in Coulombs)

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3×10^{-3} kg
$-34\,\mu C$ $\xrightarrow{a = 2.5\times10^3 m/s^2}$

$$|\vec{E}| = ? = \frac{F}{q} = \frac{ma}{q} = \frac{(3\times10^{-3}\,kg)(2.5\times10^3 m/s^2)}{(34\times10^{-6})}$$

$$= 2.2\times10^5 N/C \text{ left } (-x)$$

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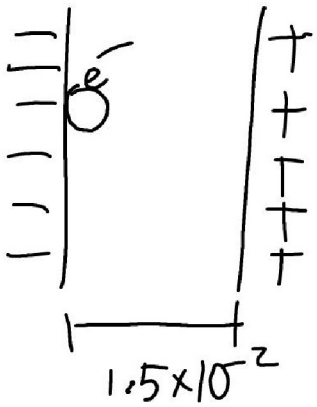
electron

$\sigma = 1.8\times10^{-7}\ \frac{C}{m^2}$

$d = 1.5\times10^{-2}\ m$

$q_e = -1.6\times10^{-19}\ C$

$m_e = 9.11\times10^{-31}\ kg$



$V_0 = 0$

$V = ?$

$a = ?$

$ma = F_e$

$\vec{E} = \frac{F_e}{q_e} = \frac{\sigma}{\varepsilon_0}$

$\frac{F_e}{1.6\times10^{-19}C} = \frac{1.8\times10^{-7}\frac{C}{m^2}}{8.85\times10^{12}\frac{C^2}{Nm^2}}$

$F_e = 3.25\times10^{-15}\ N$

NEXT

$F = -3.25\times10^{-15}N = (9.11\times10^{-31}kg)\,a$

$-3.57\times10^{15}\ m/s^2 = a$

$V_0 = 0$

$x - x_0 = 1.5\times10^{-2}\ m$

$a = $ (above)

$V = ?$

$V^2 = V_0^2 + 2a(x - x_0)$

$V^2 = 0 + 2(1.07\times10^{14})$

$V = 1.035\times10^{7}\ m/s$

Electric Potential Energy

$$U_e = \frac{kq_1q_2}{r}$$

Electric Potential (V)

Is like Electric field, but for energy instead of Force.

Due to a pt. charge: $V = \frac{kq}{r}$

$$\vec{E} = \frac{\vec{F}}{q}$$

electric Potential → $V = \frac{EPE}{q} = \frac{U_e}{q}$

NOT a vector

Positive charges accelerate from high potential to low potential