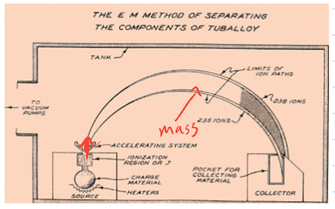
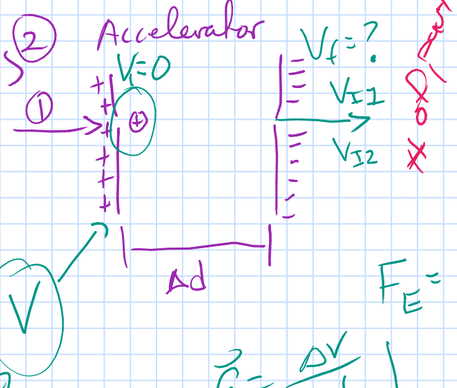
1. **ioniser** to give the particles an electric charge
   a. state where in your system it is located and the amount and sign of the charge that it imparts to the particles
2. **particle accelerator** - using uniform electric fields
   a. a schematic of the accelerator including dimensions, direction of electric field(s), direction of particle movement.
   b. sample calculations for the final velocity of the particles
3. **velocity selector** - using magnetic and electric fields to separate out particles with a different velocity
   a. a schematic of the velocity selector including dimensions, direction of electric and magnetic fields, direction of particle movement.
   b. sample calculations for the specific velocity desired and the magnitude of the respective fields required.
4. **particle separator and collector** - using uniform magnetic fields to deflect particles into specific collectors.
   a. a schematic of the particle separator including dimensions, direction of magnetic fields, particle paths and the specific location of the particle collectors.
   b. sample calculations to determine the magnitude of the magnetic field needed and the location of the particle collectors relative to the location of the particles as they enter the magnetic field.

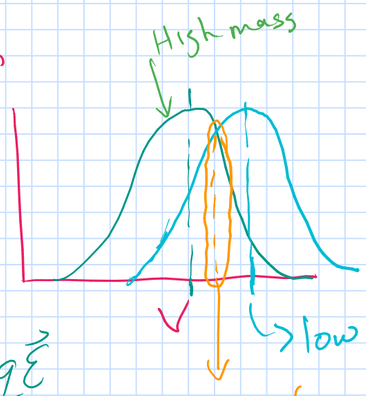


Uniform mag field.

① Name it & say what ± charge the particles will have $+1\ (\pm 1.6\times10^{-19}\ C)$

② Accelerator





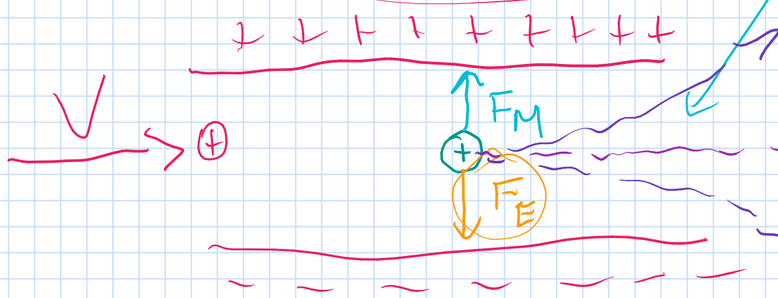
$F_E = q\vec{\mathcal{E}}$

$\vec{\mathcal{E}} = \frac{\Delta V}{\Delta d}$

↳ choose the average velocity

Final Velocities for the 2 isotopes

③ Velocity selector

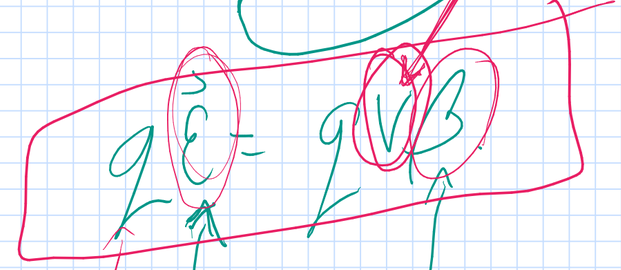


- Slow ones will have a smaller F_M
- faster ones will have a larger F_M.

$F_M = F_E$

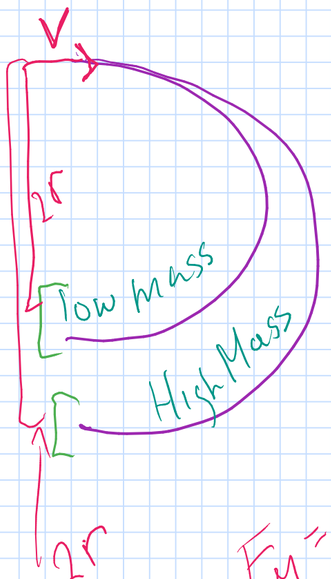
$F_E = q\mathcal{E}$

$F_M = qvB$



Voltage ≠ Plate separation

No more than ~2T Earth's field



Math from 01/19. Circular motion

$F_M = qvB$

↳ of the particle.

Circular

$F_M = F_C$

$\frac{mv^2}{r} = qvB$

↳ strength

