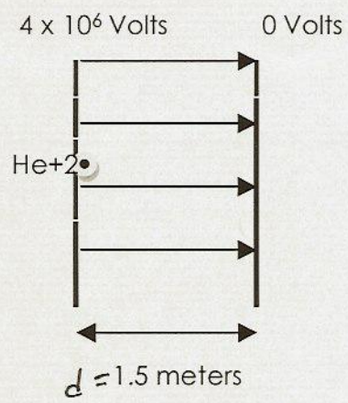
Answer Key



Is this typical for a Tandem VdG? cite

much better image explicit please.

1. On the diagram above draw in lines to represent the electric field

   Field lines go from + to – and equal distance apart

2. Calculate the electric field strength between the two plates.

   $\vec{E}$ = ***2.6 x 10⁶ V/M or 2.6 x 10⁶ N/C***

3. Draw a vector to represent the force on the particle due to the electric field.

4. Calculate the force on the particle.

   He+2 has two excess protons, each with a charge of 1.6 x 10⁻¹⁹ C

   $|\vec{F}| = q|\vec{E}|$ = ***(3.2 x 10⁻¹⁹ C)(2.6 x 10⁶ N/C) = 8.3 x 10⁻¹³ N***

5. Calculate the energy of the particle when it reaches plate B.

   Change in energy is work, or force times distance

   is this a lot? Comment.

   $W = \Delta KE = |\vec{F}||\vec{d}|$ = ***(8.3 x 10⁻¹³ N)(1.5 m) = 1.3 x 10¹² Nm or 1.3 x 10⁻¹² J of kinetic energy***

6. Calculate the particle's velocity when it reaches plate B. (Mass of a alpha particle is 2 protons + 2 neutrons)

   Kinetic energy is ½ mv²

   1.3 x 10⁻¹² J = ½ (4 x 1.7x10⁻²⁷)(v²) and solve for v

   v = 2.0x10⁷ m/s

↑ is this relativistic concern? is this realistic for your experiment? cite!