

### Answer on Question #59073-Physics-Electromagnetism

A positive ion passes through an electric and magnetic fields which are mutually perpendicular. The electric field strength is 20.0kV/m while the magnetic flux density is 0.40T. At what speed will the ion pass through undeflected?

6.0×10<sup>4</sup> m/s

5.0×10<sup>4</sup> m/s

7.0×10<sup>4</sup> m/s

### Solution

Charged particles are undeflected when the electric and magnetic deflecting forces are equal (and opposite in direction).

$$qE = Bqv$$

$$v = \frac{E}{B} = \frac{20000}{0.40} = 5.0 \cdot 10^4 \frac{m}{s}$$

**Answer: 5.0×10<sup>4</sup> m/s.**