11. Since the total force given by $\vec{F} = e(\vec{E} + \vec{v} \times \vec{B})$ vanishes, the electric field $\vec{E}$ must be perpendicular to both the particle velocity $\vec{v}$ and the magnetic field $\vec{B}$. The magnetic field is perpendicular to the velocity, so $\vec{v} \times \vec{B}$ has magnitude vB and the magnitude of the electric field is given by $E = vB$. Since the particle has charge e and is accelerated through a potential difference V, $\frac{1}{2}mv^2 = eV$ and $v = \sqrt{2eV/m}$. Thus,

$$E = B\sqrt{\frac{2eV}{m}} = (1.2\text{T})\sqrt{\frac{2(1.60 \times 10^{-19}\,\text{C})(10 \times 10^3\,\text{V})}{(6.0\,\text{u})(1.661 \times 10^{-27}\,\text{kg/u})}} = 6.8 \times 10^5\ \text{V/m}\ .$$