37.28. Solve: **(a)** The kinetic energy of the electron is

$$K = (\gamma - 1)mc^2 = (1.01 - 1)\left(9.11 \times 10^{-31}\ \text{kg}\right)\left(3.0 \times 10^{8}\ \text{m/s}\right)^2 = 0.8199 \times 10^{-15}\ \text{J} \times \frac{1\ \text{eV}}{1.6 \times 10^{-19}\ \text{J}} = 0.00512\ \text{MeV}$$

(b) Likewise for the proton,

$$K = (1.01 - 1)\left(1.67 \times 10^{-27}\ \text{kg}\right)\left(3.0 \times 10^{8}\ \text{m/s}\right)^2 = 9.39\ \text{MeV}$$

(c) Likewise for the alpha particle,

$$K = (1.01 - 1)(4)\left(1.67 \times 10^{-27}\ \text{kg}\right)\left(3.0 \times 10^{8}\ \text{m/s}\right)^2 = 37.6\ \text{MeV}$$