

30. Let the volume be $\mathcal{V} = 1.0 \times 10^{-6} \text{ m}^3$. Then,

$$\begin{aligned} K_{\text{total}} &= NE_{\text{avg}} = n\mathcal{V}E_{\text{avg}} \\ &= (8.43 \times 10^{28} \text{ m}^{-3})(1.0 \times 10^{-6} \text{ m}^3) \left(\frac{3}{5}\right) (7.0 \text{ eV})(1.6 \times 10^{-19} \text{ J/eV}) \\ &= 5.7 \times 10^4 \text{ J} = 57 \text{ kJ} . \end{aligned}$$