

4. We note that $n = 8.43 \times 10^{28} \text{ m}^{-3} = 84.3 \text{ nm}^{-3}$. From Eq. 42-9,

$$E_F = \frac{0.121(hc)^2}{m_e c^2} n^{2/3} = \frac{0.121(1240 \text{ eV} \cdot \text{nm})^2}{511 \times 10^3 \text{ eV}} (84.3 \text{ nm}^{-3})^{2/3} = 7.0 \text{ eV}$$

where the result of problem 3 in Chapter 39 is used.