

4.14 This problem calls for a determination of the number of atoms per cubic meter for lead. In order to solve this problem, one must employ Equation 4.2,

$$N = \frac{N_A \rho_{\text{Pb}}}{A_{\text{Pb}}}$$

The density of Pb (from the table inside of the front cover) is 11.35 g/cm^3 , while its atomic weight is 207.2 g/mol . Thus,

$$\begin{aligned} N &= \frac{(6.023 \times 10^{23} \text{ atoms/mol})(11.35 \text{ g/cm}^3)}{207.2 \text{ g/mol}} \\ &= 3.30 \times 10^{22} \text{ atoms/cm}^3 = 3.30 \times 10^{28} \text{ atoms/m}^3 \end{aligned}$$