

4.15 In order to compute the concentration in kg/m^3 of Si in a 0.25 wt% Si-99.75 wt% Fe alloy we must employ Equation 4.9 as

$$C_{\text{Si}}'' = \frac{C_{\text{Si}}}{\frac{C_{\text{Si}}}{\rho_{\text{Si}}} + \frac{C_{\text{Fe}}}{\rho_{\text{Fe}}}} \times 10^3$$

From inside the front cover, densities for silicon and iron are 2.33 and 7.87 g/cm^3 , respectively; and, therefore

$$\begin{aligned} C_{\text{Si}}'' &= \frac{0.25}{\frac{0.25}{2.33 \text{ g/cm}^3} + \frac{99.75}{7.87 \text{ g/cm}^3}} \times 10^3 \\ &= 19.6 \text{ kg/m}^3 \end{aligned}$$