

4.16 We are asked in this problem to determine the approximate density of a Ti-6Al-4V titanium alloy that has a composition of 90 wt% Ti, 6 wt% Al, and 4 wt% V. In order to solve this problem, Equation 4.10a is modified to take the following form:

$$\rho_{\text{ave}} = \frac{100}{\frac{C_{\text{Ti}}}{\rho_{\text{Ti}}} + \frac{C_{\text{Al}}}{\rho_{\text{Al}}} + \frac{C_{\text{V}}}{\rho_{\text{V}}}}$$

And, using the density values for Ti, Al, and V—i.e., 4.51 g/cm³, 2.71 g/cm³, and 6.10 g/cm³—(as taken from inside the front cover of the text), the density is computed as follows:

$$\begin{aligned} \rho_{\text{ave}} &= \frac{100}{\frac{90 \text{ wt\%}}{4.51 \text{ g/cm}^3} + \frac{6 \text{ wt\%}}{2.71 \text{ g/cm}^3} + \frac{4 \text{ wt\%}}{6.10 \text{ g/cm}^3}} \\ &= 4.38 \text{ g/cm}^3 \end{aligned}$$