

4.12 We are asked to compute the composition of a Pb-Sn alloy in atom percent. Employment of Equation 4.6 leads to

$$\begin{aligned}
 C'_{\text{Pb}} &= \frac{C_{\text{Pb}}A_{\text{Sn}}}{C_{\text{Pb}}A_{\text{Sn}} + C_{\text{Sn}}A_{\text{Pb}}} \times 100 \\
 &= \frac{5.5(118.69 \text{ g/mol})}{5.5(118.69 \text{ g/mol}) + 94.5(207.2 \text{ g/mol})} \times 100 \\
 &= 3.2 \text{ at\%}
 \end{aligned}$$

$$\begin{aligned}
 C'_{\text{Sn}} &= \frac{C_{\text{Sn}}A_{\text{Pb}}}{C_{\text{Sn}}A_{\text{Pb}} + C_{\text{Pb}}A_{\text{Sn}}} \times 100 \\
 &= \frac{94.5(207.2 \text{ g/mol})}{94.5(207.2 \text{ g/mol}) + 5.5(118.69 \text{ g/mol})} \times 100 \\
 &= 96.8 \text{ at\%}
 \end{aligned}$$