

$$= \frac{(6 \text{ atoms/unit cell})(24.31 \text{ g/mol})}{(1.38 \times 10^{-22} \text{ cm}^3/\text{unit cell})(6.023 \times 10^{23} \text{ atoms/mol})}$$

$$= 1.75 \text{ g/cm}^3$$

The value given in the table is 1.74 g/cm³.

Tungsten has a BCC crystal structure for which $n = 2$ and $a = \frac{4R}{\sqrt{3}}$ (Equation 3.3); also $A_W = 183.85$ g/mol and $R = 0.137$ nm. Therefore, employment of Equation 3.5 leads to

$$\rho = \frac{(2 \text{ atoms/unit cell})(183.85 \text{ g/mol})}{\left\{ \left[\frac{(4)(1.37 \times 10^{-8} \text{ cm})}{\sqrt{3}} \right]^3 / (\text{unit cell}) \right\} (6.023 \times 10^{23} \text{ atoms/mol})}$$

$$= 19.3 \text{ g/cm}^3$$

The value given in the table is 19.3 g/cm³.