

CHAPTER 4

IMPERFECTIONS IN SOLIDS

PROBLEM SOLUTIONS

Vacancies and Self-Interstitials

4.1 In order to compute the fraction of atom sites that are vacant in copper at 1357 K, we must employ Equation 4.1. As stated in the problem, $Q_v = 0.90$ eV/atom. Thus,

$$\begin{aligned}\frac{N_v}{N} &= \exp\left(-\frac{Q_v}{kT}\right) = \exp\left[-\frac{0.90 \text{ eV/atom}}{(8.62 \times 10^{-5} \text{ eV/atom} \cdot \text{K})(1357 \text{ K})}\right] \\ &= 4.56 \times 10^{-4}\end{aligned}$$