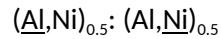


Assignment 3: Gibbs energy of AlNi phase (CsCl type) is modeled using two-sublattices as indicated below:



Calculate the site fractions of its sublattice constituents at 1200 K and 60 at. % of Ni. Write your program to do this. (Due date: 05-04-2018)

Given:

$$G_{\text{Al:Al}}^{\text{AlNi}} = +10083 - 4.813 * T + \text{GHSERAL}$$

$$G_{\text{Ni:Ni}}^{\text{AlNi}} = +8715.08 - 3.556 * T + \text{GHSERNI}$$

$$G_{\text{Al:Ni}}^{\text{AlNi}} = -56500 - 10.7 * T + 1.4975 * T * \ln(T) + 0.5 * \text{GHSERAL} + 0.5 * \text{GHSERNI}$$

$$G_{\text{Al:Ni}}^{\text{AlNi}} = G_{\text{Ni:Al}}^{\text{AlNi}}$$

$${}^0L_{\text{Al,Ni:Al}}^{\text{AlNi}} = -14225 - 5.625 * T$$

$${}^0L_{\text{Al:Al,Ni}}^{\text{AlNi}} = {}^0L_{\text{Al,Ni:Al}}^{\text{AlNi}}$$

$${}^0L_{\text{Ni:Al,Ni}}^{\text{AlNi}} = -22050$$

$${}^0L_{\text{Al,Ni:Ni}}^{\text{AlNi}} = {}^0L_{\text{Ni:Al,Ni}}^{\text{AlNi}}$$

$${}^1L_{\text{Ni:Al,Ni}}^{\text{AlNi}} = +1115$$

$${}^1L_{\text{Al,Ni:Ni}}^{\text{AlNi}} = {}^1L_{\text{Ni:Al,Ni}}^{\text{AlNi}}$$

$$\text{GHSERAL} = -11278.4 + 188.684 * T - 31.7482 * T * \ln(T) - 1.231e+028 * T^{**}(-9)$$

$$\text{GHSERNI} = -5179.16 + 117.854 * T - 22.096 * T * \ln(T) - 0.0048407 * T^{**}2$$