

57. From Eq. 41-29, $N_2/N_1 = e^{-(E_2-E_1)/kT}$. We solve for T :

$$T = \frac{E_2 - E_1}{k \ln(N_1/N_2)} = \frac{3.2 \text{ eV}}{(1.38 \times 10^{-23} \text{ J/K}) \ln(2.5 \times 10^{15}/6.1 \times 10^{13})} = 10000 \text{ K} .$$