

9. The probability of finding an electron at the energy state E_n is given by $1/[1 + \exp((E_n - E_f)/kT)]$. The probability is e^{-10} , indicating that $E_n - E_f \sim 10 kT$. Since $E_n = E_c + kT$, $E_f - E_c = -9 kT$. That is, the Fermi level is below the conduction band by an amount of $9 kT$.