Density of States Lesson

Density of States

The number of allowed states in the energy bands grows as the number of atoms in a solid increases. When the number becomes very large, the energy states are so close together they "blend" and become a continuous band of allowed states. These bands become the valence band and the conduction band of the crystal. Electrons can only be found in these bands. No other energies are allowed. We use $g_c(E)$ and $g_v(E)$ to determine the density of states at energies close to the edges of the energy bands. These equations model the distribution of the energy states in the valence band and the conduction band.

$$g_v(E) = \frac{m^*_p \sqrt{2m^*_p (E_v - E)}}{\pi^2 \hbar^3}$$

E ? E_v

$$g_c(E) = \frac{m^*_n \sqrt{2m^*_n (E - E_c)}}{\pi^2 \hbar^3}$$

E ? E_c