scattering type, the resultant mobility is therefore smaller than that determined by any of the individual scattering mechanisms. Because of the reciprocal relation for combining mobility components (Equation 1.2.9), the overall mobility is dominated by the process for which τ_i is smallest.

We can apply these considerations to the mobilities of electrons and holes in silicon at room temperature which are plotted in Figure 1.15. The figure represents

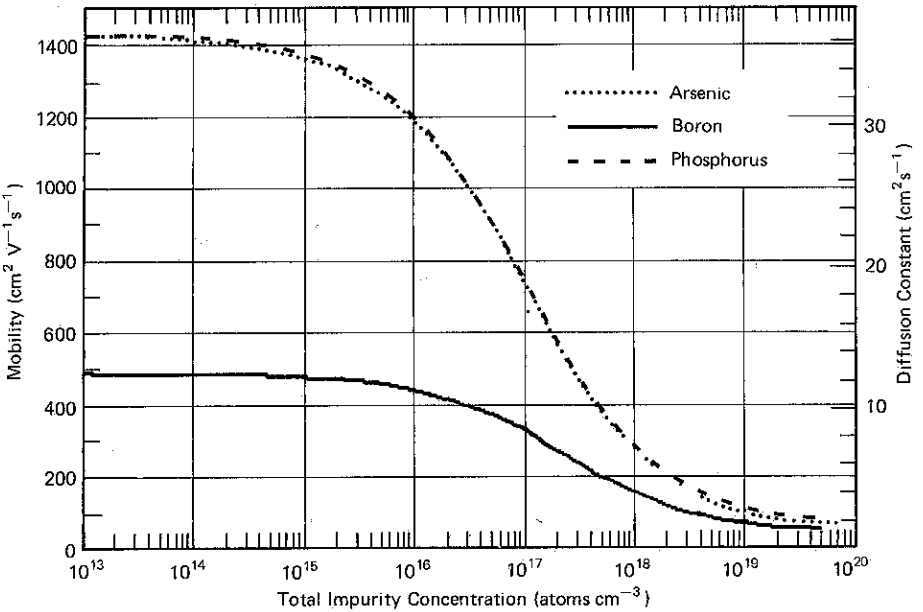

Figure 1.15 Electron and hole mobilities in silicon at 300 K as functions of the total dopant concentration. The values plotted are the results of curve fitting measurements from several sources. The mobility curves can be generated using Equation 1.2.10 with the following parameter values:[3]

Parameter	Arsenic	Phosphorus	Boron
μ_{min}	52.2	68.5	44.9
μ_{max}	1417	1414	470.5
N_{ref}	9.68×10^{16}	9.20×10^{16}	2.23×10^{17}
α	0.680	0.711	0.719