From S.M. Sze,
Physics of Semiconductor Devices

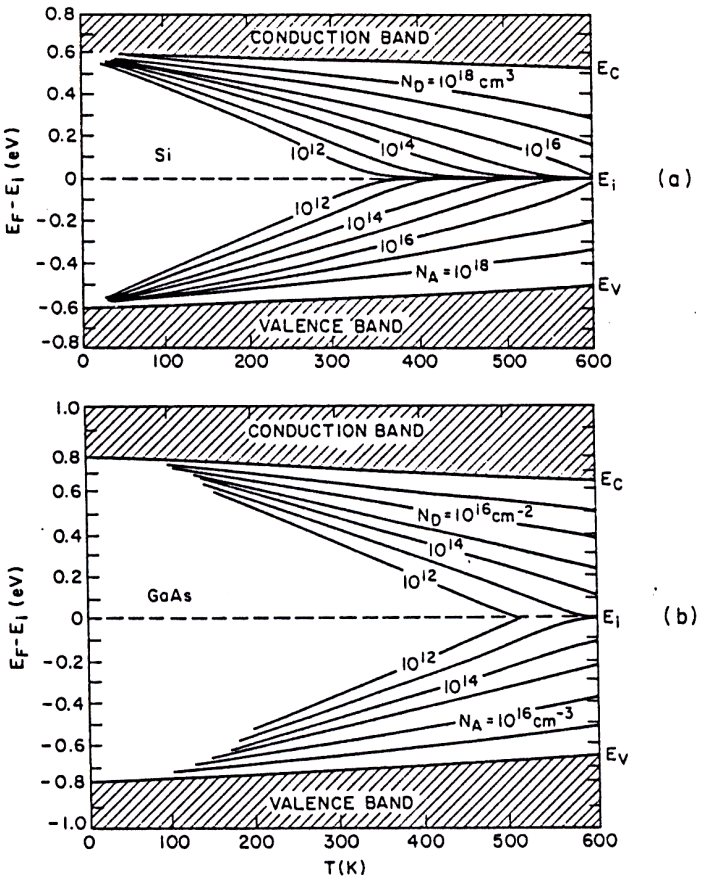

Fig. 22 Fermi level for Si and GaAs as a function of temperature and impurity concentration. The dependence of the bandgap on temperature is shown in the figure.[6]

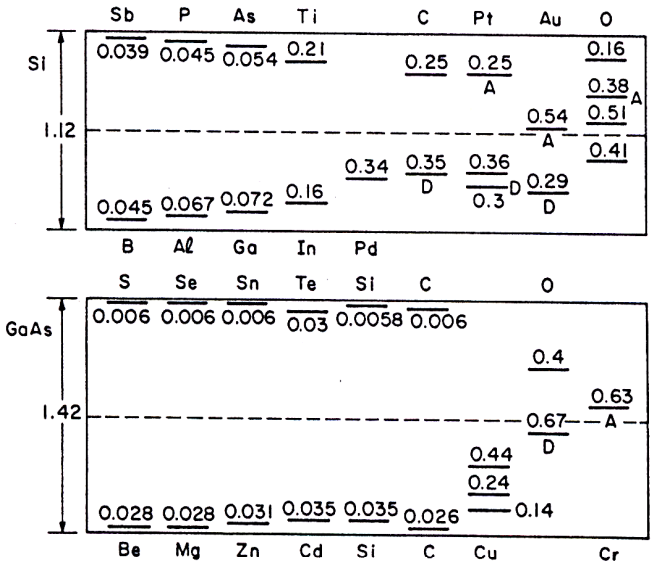

Fig. 18 Measured ionization energies for various impurities in Si and GaAs. The levels below the gap center are measured from the top of the valence bond and are acceptor levels unless indicated by D for donor level. The levels above the gap center are measured from the bottom of the conduction band and are donor levels unless indicated by A for acceptor level.[5]

At high enough temperature, all semiconductors look like intrinsic, regardless of donor concentration.

Electrons from VB ionized to donor level

All donors completely ionized to CB

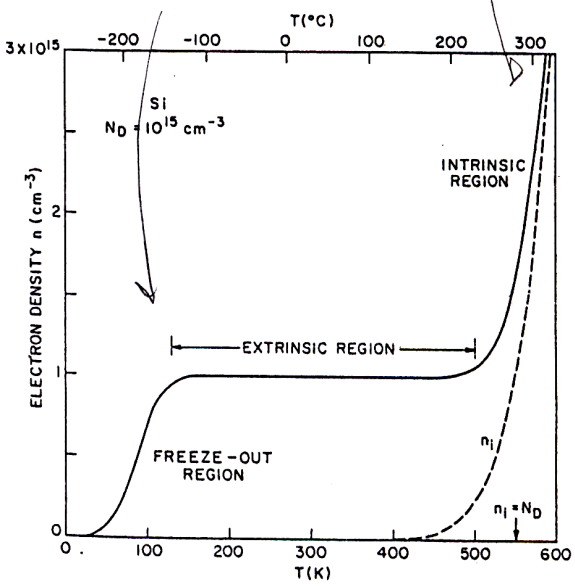

Fig. 23 Electron density as a function of temperature for a Si sample with a donor concentration of $10^{15}\ cm^{-3}$.

Same as Stokes Fig. 10-9