

[Large Systems]

(Chapter 1.2.1 in *Elements*)

Although the systems that might be studied are very complex, involving sometimes mole quantities of atoms, it is of great significance that the neutron-nuclear interactions are very simple. The simplicity of the fundamental interaction greatly facilitates the interpretation of neutron scattering measurements. It is of further great significance that neutrons that have equilibrated in energy with surroundings at room temperature (in round numbers, $T = 300\text{ K}$, energy $k_B T = 0.025\text{ eV}$, speed $v = 2200\text{ m/s}$) have a wavelength $\lambda = 1.82\text{ \AA}$. The energy is comparable to the energy of motion of atoms in practical materials under practical conditions, and the wavelength is comparable to the interatomic spacing of atoms in practical materials.