(19.4) Calculate the number of collisions required to reduce a fast fission neutron (E_n^0 = 2 MeV) to thermal energy (E_n 0.025 eV) in a light-water-moderated reactor, assuming that the data in Table 19.3 are valid.

Data, constants, and units:

$eV := 1.6021773 \cdot 10^{-19} \cdot joule$ $\xi := 0.927$

Data given in the text:

$E_{0n} := 2 \cdot 10^6 \cdot eV$ $E_n := 0.025 \cdot eV$

Calculations:

$n := \xi^{-1} \cdot ln\left(\frac{E_{0n}}{E_n}\right) + 1$ Eqn. (19.7) $n = 20.63$

$n = 21$ average number of collisions