$$\gamma = K_1 \frac{Z}{\sqrt{E}} - K_2 \sqrt{Z r_1} \tag{9.26}$$

where

$$K_1 = 1.980\,\mathrm{MeV}^{1/2}, \quad K_2 = 1.485\,\mathrm{fm}^{-1/2}$$

$$\tau = \frac{2r_1}{v} e^{2\gamma} \tag{9.29}$$

For U^{238} we have $U^{238} \rightarrow Th^{234}$ and

$$\begin{aligned} A &= 238 \\ Z &= 92 \\ E &= 5.29\,\mathrm{MeV} \\ v &= 1.60 \times 10^7\,\mathrm{m/s} \\ \tau &= 2.11 \times 10^8\,\mathrm{years} \end{aligned}$$

Note: For $E = 5.1\,\mathrm{MeV}$ the result is $\tau = 4.28 \times 10^9$ years.

Per Wikipedia $E = 4.267\,\mathrm{MeV}$ and $\tau = 4.468 \times 10^9$ years.

FIXME Po^{121}