

(14.5) ^{244}Pu decays through spontaneous fission with a half-life of $6.6 \cdot 10^{10}$ y. Estimate the number of neutrons emitted per fission if the measured n-emission rate is $1890 \text{ n s}^{-1} \text{ g}^{-1}$.

$$N_A := 6.022137 \cdot 10^{23} \cdot \text{mole}^{-1} \quad t_{\text{half fission}} := 6.6 \cdot 10^{10} \cdot \text{yr} \quad A_{n\text{Pu}} := 1890 \cdot \text{sec}^{-1} \cdot \text{gm}^{-1}$$

$$M_{\text{Pu}} := 244 \cdot \text{gm} \cdot \text{mole}^{-1} \quad m_{\text{Pu}} := 1 \cdot \text{gm}$$

$$N_{\text{Pu}} := \frac{m_{\text{Pu}}}{M_{\text{Pu}}} \cdot N_A \quad \lambda_{\text{fission}} := \frac{\ln(2)}{t_{\text{half fission}}}$$

$$A_{\text{fission}} := \lambda_{\text{fission}} \cdot N_{\text{Pu}} \quad n_{\text{per fission}} := \frac{m_{\text{Pu}} \cdot A_{n\text{Pu}}}{A_{\text{fission}}} \quad n_{\text{per fission}} = 2.301$$