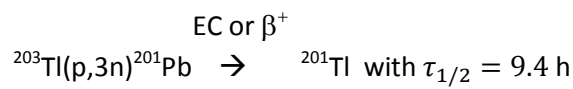


Lecture 4 – exercises

1. If $\lambda = 0.01 \text{ s}^{-1}$ on average how many atoms undergo radioactive decay per unit time?
2. Determine the (radio)activity Q decay law
3. Calculate relation between $\tau_{1/2}$ and λ and express Q as function of $\tau_{1/2}$
4. Two patients undergo nuclear medicine scans. One receives a dose of radiotracer A with $\tau_{1/2} = 6 \text{ h}$ and the other a dose of radiotracer B with $\tau_{1/2} = 24 \text{ h}$. If dose of radiotracer A is $3 \times$ dose of radiotracer B and $\tau_{1/2, \text{bio}}$ of A is 6 h and of B 12 h, at what time the radioactivity in the body of the two patients is the same?
5. Draw the function $N_2 = \frac{\lambda_1 N_0}{\lambda_2 - \lambda_1} (e^{-\lambda_1 t} - e^{-\lambda_2 t})$ and explain the behaviour of N_2 as function of time in your own words
6. The following reaction describes the production of Thallium-201 in a cyclotron:



Describe this reaction in words