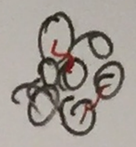

~ fm $\quad R_{A_Z} = A^{1/3} \cdot 1.25\,\text{fm}$

$m_{A_Z} = N \cdot m_n + Z\, m_p + Z m_e - BE/c^2$

$A = N + Z$ $\qquad BE \sim A$

$u = \frac{1}{12} m_{^{12}C} = 931.494 \frac{MeV}{c^2}$

roughly: $m_{A_Z} \approx A \cdot u$

$^2H + {}^3H \rightarrow {}^4He + n$

$^{235}U + n \rightarrow {}^{236}U^* \Rightarrow {}^{100}_{42}Mo + {}^{128}_{50}Sn + 8n + 147\,MeV$

magic numbers

$Z, N = 2, (4), 8, \ldots 20$

Decays: γ decay: γ-ray spont. emission

$\alpha = {}^4He \quad {}^A_Z \rightarrow {}^{A-4}_{Z-2} + {}^4He$

$\beta: \begin{cases} \beta^+ & p \rightarrow n + e^+ + \nu_e \\ \beta^- & n \rightarrow p + e^- + \bar{\nu}_e \end{cases}$

γ

$e^{i \vec{p} \cdot \vec{r} / \hbar} \quad p = 420 \frac{MeV}{c}$

$\lambda \approx \frac{h}{p} = \frac{2\pi \cdot 200\ fm\ MeV/c}{420\ MeV/c} \simeq 3\,fm$

Decay time: τ

$N(t) = N_0 e^{-t/\tau} = N_0 \cdot \left(\frac{1}{2}\right)^{t/t_{1/2}}$