

Kernspaltung - "Little Boy"

a)

b)

c)

Kernfusion und Gamov-Faktor

a)

b)

$$Q = c^2(M_U - M_{Ba} - M_{Kr} - 3M_n) = \underline{\underline{166.7 \text{ MeV}}}$$

c) $m = 0.8 \text{ kg}; \quad E_{\text{TNT}} = 4.184 \text{ MJ} = 2.61 \cdot 10^{19} \text{ MeV}$

$$E_U = \frac{m}{M_U} Q = 3.40 \cdot 10^{24} \text{ MeV}$$

$$\frac{E}{E_{\text{TNT}}} = 1.3 \cdot 10^7$$

d)

$$\Delta E_{\text{TNT}} = Q \frac{E_{\text{TNT}}}{E_U} = \underline{\underline{12.79 \text{ eV}}}$$

e)

$$\Delta M = \frac{E_U}{c^2} = \underline{\underline{3.65 \cdot 10^{23} \text{ u}}} = 0.60 \text{ g}$$

Energiebilanz der Sonne

a) $\langle E_p \rangle = 1.3 \text{ keV}$

$$E_G = 2\mu c^2(\alpha\pi Z_p^2) = m_p c^2(2\alpha\pi)^2 = \underline{\underline{1.97 \text{ MeV}}}$$

$$G(E) = \sqrt{\frac{ER_G}{\langle E_p \rangle}} = \underline{\underline{38.95}}$$

$$T = e^{-G(R)} = \underline{\underline{1.21 \cdot 10^{-17}}}$$

b)

c)