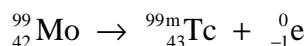
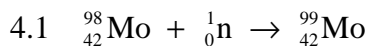
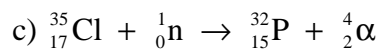
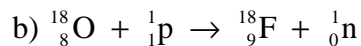
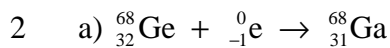
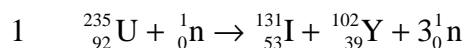
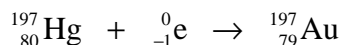
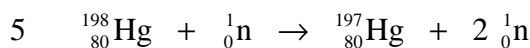


Anwendungsaufgaben - Künstliche Kernumwandlungen - Lösungen



$$4.2 \quad N = N_0 \cdot \left(\frac{1}{2}\right)^{\frac{t}{T}} = N_0 \cdot \left(\frac{1}{2}\right)^{\frac{24}{67}} = N_0 \cdot 0,78$$

Nach 24 Stunden sind noch 78 % der Molybdänisotope vorhanden.



$$6.1 \quad E = m \cdot c^2 = 0,82 \cdot 10^{-3} \text{ kg} \cdot 9,0 \cdot 10^{16} \frac{\text{m}^2}{\text{s}^2} = 7,4 \cdot 10^{13} \text{ J} = 7,4 \cdot 10^{10} \text{ kWs} = 21 \cdot 10^6 \text{ kWh}$$

$$6.2 \quad E = H \cdot m = H \cdot V \cdot \rho$$

$$\Rightarrow V = \frac{E}{H \cdot \rho} = \frac{7,4 \cdot 10^{13} \text{ J}}{42 \cdot 10^6 \frac{\text{J}}{\text{kg}} \cdot 0,95 \frac{\text{kg}}{\text{dm}^3}} = 1,9 \cdot 10^6 \text{ l}$$

$$7.1 \quad \Delta m = (3,3437 + 5,0091 - 6,6449 - 1,6749) \cdot 10^{-27} \text{ kg} = 0,033 \cdot 10^{-27} \text{ kg}$$

$$7.2 \quad E = m \cdot c^2 = 0,033 \cdot 10^{-27} \text{ kg} \cdot (2,9979 \cdot 10^8)^2 \frac{\text{m}^2}{\text{s}^2}$$

$$= 2,9658 \cdot 10^{-12} \frac{\text{kg} \cdot \text{m}}{\text{s}^2} \cdot \text{m} = 2,9658 \cdot 10^{-12} \text{ Nm} = 2,9658 \cdot 10^{-12} \text{ J}$$

7.3

Masse in kg	$(3,3437 + 5,0091) \cdot 10^{-27}$	1,0000
freigesetzte Energie in J	$2,9658 \cdot 10^{-12}$	E

$$E = \frac{2,9658 \cdot 10^{-12} \text{ J} \cdot 1,0000 \text{ kg}}{8,3528 \cdot 10^{-27} \text{ kg}} = 3,5507 \cdot 10^{14} \text{ J}$$