

Homework #10

C 7. Carbon has mass number less than that of Iron. Lower mass numbers release energy through fusion. So Carbon releases energy from fusion not fission. Gold has a mass number less than that of iron also. So Gold releases energy through fusion. Iron is the most stable nucleus and does not release energy either from fusion or fission.

10. Strong force holds the nucleus together. Electromagnetic force tends to push the nucleons apart because they are all positively or neutrally charged particles.

P 1. ^{235}U loses 1% of rest-mass during fission

$$m_0 = 10 \text{ kg}$$

$$m_{\text{lost}} = 0.01 \times 10 \text{ kg} = 0.01 \times 10,000 \text{ g} = 100 \text{ g}$$

$$E = mc^2 = m_{\text{lost}} c^2 = (100 \text{ g}) (3 \times 10^8 \text{ m/s}^2)$$

$$= (0.1 \text{ kg}) (3 \times 10^8 \text{ m/s}^2)$$

$$E = \underline{3 \times 10^7 \text{ J}}$$