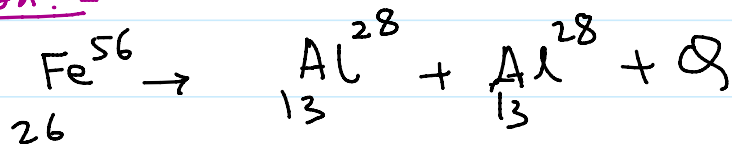


Suppose we think of fission of ${}_{26}\text{Fe}^{56}$ nucleus into two equal fragments ${}_{13}\text{Al}^{28}$. Is the fission energetically possible? Argue by working out the Q of the process.

Given: $m({}_{26}\text{Fe}^{56}) = 55.93494$ a.m.u., and $m({}_{13}\text{Al}^{28}) = 27.98191$ a.m.u.

Solution: -



$$\therefore Q = \left[m({}_{26}\text{Fe}^{56}) - 2m({}_{13}\text{Al}^{28}) \right] \times 931.5 \text{ MeV}$$

$$\therefore Q = [55.93494 - 2 \times 27.98191] \times 931.5$$

$$\therefore Q = -0.02888 \times 931.5$$

$$\therefore Q = -26.9 \text{ MeV}$$

Since the Q-value is negative, the fission of ${}_{26}\text{Fe}^{56}$ into two ${}_{13}\text{Al}^{28}$ nuclei is energetically not possible.¹³

-x-