

55. Let M_{Cs} be the mass of one atom of $^{137}_{55}\text{Cs}$ and M_{Ba} be the mass of one atom of $^{137}_{56}\text{Ba}$. To obtain the nuclear masses, we must subtract the mass of 55 electrons from M_{Cs} and the mass of 56 electrons from M_{Ba} . The energy released is $Q = [(M_{\text{Cs}} - 55m) - (M_{\text{Ba}} - 56m) - m]c^2$, where m is the mass of an electron. Once cancellations have been made, $Q = (M_{\text{Cs}} - M_{\text{Ba}})c^2$ is obtained. Therefore,

$$Q = [136.9071 \text{ u} - 136.9058 \text{ u}]c^2 = (0.0013 \text{ u})c^2 = (0.0013 \text{ u})(931.5 \text{ MeV/u}) = 1.21 \text{ MeV} .$$