

39. If  $M_{\text{He}}$  is the mass of an atom of helium and  $M_{\text{C}}$  is the mass of an atom of carbon, then the energy released in a single fusion event is

$$Q = [3M_{\text{He}} - M_{\text{C}}] c^2 = [3(4.0026 \text{ u}) - (12.0000 \text{ u})] (931.5 \text{ MeV/u}) = 7.27 \text{ MeV} .$$

Note that  $3M_{\text{He}}$  contains the mass of six electrons and so does  $M_{\text{C}}$ . The electron masses cancel and the mass difference calculated is the same as the mass difference of the nuclei.