

(10.6) What is the  $Q$ -value for the reactions: (a)  $^{11}\text{B}(d,\alpha)^9\text{Be}$ ; (b)  $^7\text{Li}(p,n)^7\text{Be}$ ?

Use eqns (10.3) and (10.4).

$$(a) \quad M_1 := 11.009305 \quad M_2 := 2.014102 \quad M_3 := 9.012182 \quad M_4 := 4.002603$$

$$Q := -931.5 \cdot (M_3 + M_4 - M_1 - M_2) \quad Q = 8.031 \quad \text{MeV}$$

$$(b) \quad M_1 := 7.016003 \quad M_2 := 1.007825 \quad M_3 := 7.016928 \quad M_4 := 1.008665$$

$$Q := -931.5 \cdot (M_3 + M_4 - M_1 - M_2) \quad Q = -1.644 \quad \text{MeV}$$