

(5.1)  $^{239}\text{Pu}$  emits alpha particles of maximum 5.152 MeV. What is the recoil energy of the product nucleus?

Given are:  $E_{\alpha} := 5.152 \text{ MeV}$      $A := 239$

$A_d := A - 4$       Because the mass number  $A$  is unchanged in low energy reactions, eqn. (5.9).

$Q_{\alpha} := E_{\alpha} \frac{A}{A_d}$       From eqn. (5.18)     $Q_{\alpha} = 5.240 \text{ MeV}$

$E_d := Q_{\alpha} \frac{4}{A}$       From eqn. (5.17)     $E_d = 0.088 \text{ MeV}$  ( $^{235}\text{U}$ )