(4.5) The binding energy of a K-electron in barium is 37441 eV. Calculate from Figure 4.1 the internal conversion energy for ^{137m}Ba (Fig. 4.5).

The K-peak in Fig. 4.1. is at about 3.4*10^{-3} Tesla meter, hence 0.0034 Tesla meter corresponds to an (relativistic mass) electron energy of 0.51 MeV.

$eV := 1.6021773 \cdot 10^{-19} \cdot joule$ $\quad MeV := 10^{6} \cdot eV$ $\quad amu := 1.6605402 \cdot 10^{-27} \cdot kg$

$M_e := 5.485799 \cdot 10^{-4} \cdot amu$ $\quad M_d := 137 \cdot amu$

$Mdc2 := M_d \cdot 931.5 \cdot MeV \cdot amu^{-1}$

$E_d := M_e \cdot \frac{0.51 \cdot MeV}{M_d} + \frac{(0.51 \cdot MeV)^2}{2 \cdot Mdc2}$ Eqn. (4.32) $\quad E_d = 3.061 \cdot 10^{-6} \cdot MeV$

$Q := E_d + 0.51 \cdot MeV + 37441 \cdot eV$ $\quad Q = 0.547 \cdot MeV$