

(4.1) Calculate the nucleon binding energy in  $^{24}\text{Mg}$  from the atomic mass excess value in Table 4.1.

$$amu := 1.6605402 \cdot 10^{-27} \cdot kg \quad MeV := 1.60217733 \cdot 10^{-13} \cdot joule$$

$$\delta_A := -14958 \cdot 10^{-6} \cdot amu \quad M_{Mg} := 24 \cdot amu + \delta_A \quad \text{from eqn. (4.7)} \quad M_{Mg} = 3.982813 \cdot 10^{-26} \cdot kg$$

$$A := 24 \quad Z := 12 \quad M_{Mg} = 23.985042 \cdot amu$$

$$N := A - Z \quad (\text{eqn. (3.1)})$$

$$M_H := 1.007825 \cdot amu \quad M_n := 1.008665 \cdot amu \quad (\text{Data from Table 3.1})$$

$$\Delta M_A := M_{Mg} - Z \cdot M_H - N \cdot M_n \quad (\text{eqn. (4.5)})$$

$$E_B := -931.5 \cdot \frac{MeV}{amu} \cdot \Delta M_A \quad (\text{eqn. (4.10)}) \quad E_B = 198.259 \cdot MeV$$

$$\frac{E_B}{A} = 8.261 \cdot MeV \quad \text{per A}$$