Esim. Laske $^{32}P$ - ytimen hajoamisenergia.

Ratk. $^{32}_{15}P \xrightarrow{\beta^-} {}^{32}_{16}S + {}^{0}_{-1}e + \bar{\nu}$

$$Q = \Delta m c^2 = \Big[ \underbrace{(m(^{32}P) - 15m_e)}_{^{32}P\text{-ydin}} - \underbrace{(m(^{32}S) - 16m_e)}_{^{32}S\text{-ydin}} - m_e \Big] c^2$$

$$= \left[ m(^{32}P) - m(^{32}S) \right] c^2$$

$$= \ldots = 0{,}001\ 837\ \mu \cdot 931{,}494\ 102\ \frac{\text{MeV}}{\mu}$$

$$= 1{,}711\ 154\ 665\ \text{MeV} \simeq \underline{1{,}71\ \text{MeV}}$$

Yleisesti 1° $\beta^-$ - hajoaminen $^{A}_{Z}X \xrightarrow{\beta^-} {}^{A}_{Z+1}Y + {}^{0}_{-1}e + \bar{\nu}$

$$\boxed{Q = \Delta m c^2 = \left[ m(^AX) - m(^AY) \right] c^2}$$

2° $\beta^+$ - hajoaminen $^{A}_{Z}X \xrightarrow{\beta^+} {}^{A}_{Z-1}Y + {}^{0}_{1}e + \nu$

$$\boxed{Q = \Delta m c^2 = \left[ m(^AX) - m(^AY) - 2m_e \right] c^2}$$

3° elektronisieppaus $^{A}_{Z}X + {}^{0}_{-1}e \xrightarrow{EC} {}^{A}_{Z-1}Y + \nu$

$$\boxed{Q = \Delta m c^2 = \left[ m(^AX) - m(^AY) \right] c^2}$$

Esim. Kirjato $^{232}U$:n hajoamisessa syntyvän tytärytimen hajoamisyhtälö. Laske sen hajoamisenergia ja syntyvän $\alpha$-hiukkasen energia.

Ratk. $^{232}_{92}U \longrightarrow {}^{228}_{90}Th + {}^{4}_{2}He \Rightarrow \underline{{}^{228}_{90}Th \longrightarrow {}^{224}_{88}Ra + {}^{4}_{2}He}$

($^{228}Th$: tytärydin)

$$Q = \Delta m c^2 = m(^{228}Th) - m(^{224}Ra) - m(^4He)$$