5.1

$A = 188$

$Z = ?$

$m_p = 938{,}3\ MeV/c^2$

$m_n = 939{,}6\ MeV/c^2$

$a_V = 15{,}85\ MeV/c^2$

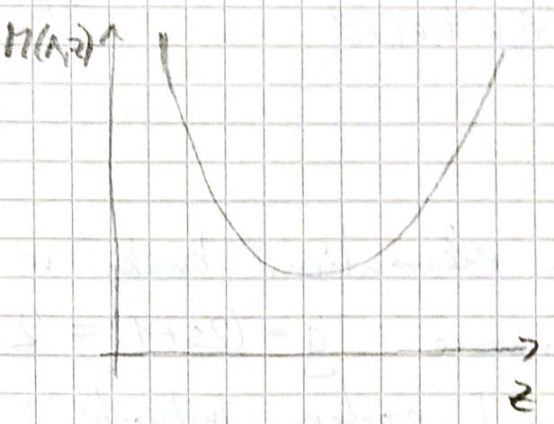
$a_S = 18{,}34\ MeV/c^2$

$a_C = 0{,}71\ MeV/c^2$

$a_A = 92{,}9\ MeV/c^2$

$a_P = 11{,}5\ MeV/c^2$

$$M(A,Z) = Z m_p + (A-Z) m_n - a_V A + a_S A^{\frac{2}{3}} + a_C Z^2 A^{-\frac{1}{3}} + a_A \left(Z - \frac{A}{2}\right)^2 A^{-1} \pm \delta, \quad \delta = a_P A^{-\frac{1}{2}}$$



$$\delta = a_P A^{-\frac{1}{2}} = 11{,}5 \cdot (188)^{-\frac{1}{2}} \doteq 0{,}84\ MeV/c^2$$

$$\left(\frac{\partial M(A,Z)}{\partial Z}\right)_A = m_p - m_n + 2a_C A^{-\frac{1}{3}} Z + 2a_A A^{-1}\left(Z - \frac{A}{2}\right) \doteq^{!} 0$$

$$\left(2a_C A^{-\frac{1}{3}} + 2a_A A^{-1}\right) Z + m_p - m_n - a_A = 0$$

$$Z = \frac{A}{2} \frac{m_n - m_p + a_A}{a_A + a_C A^{\frac{2}{3}}} = \frac{A}{2} \frac{939{,}6 - 938{,}3 + 92{,}9}{92{,}9 + 0{,}71\, A^{\frac{2}{3}}} \doteq \frac{A}{1{,}97 + 0{,}015 A^{\frac{2}{3}}} \doteq$$

$$\doteq 76{,}2$$

$M(188, 76) = 175\,038{,}2\ MeV/c^2$

$M(188, 77) = 175\,039{,}3\ MeV/c^2$

$$Z = 76$$