(16.10) A cyclotron can accelerate $^4He^{2+}$-ions to 35 MeV. (a) What is its K-value? To what energy would it accelerate (b) $^{16}O^{6+}$ and (c) $^{18}O^{8+}$ ions?

$MeV := 1.60217733 \cdot 10^{-13} \cdot joule$

$A_{He} := 4$ $E_{He} := 35 \cdot MeV$ $z_{He} := 2$

$K_{cyclo} := \dfrac{E_{He}}{A_{He}} \cdot \left(\dfrac{A_{He}}{z_{He}}\right)^2$ From eqn. (16.11)

(a) $K_{cyclo} = 35 \cdot MeV$

(b) $A_O := 16$ $z_O := 6$ $E_O := A_O \cdot K_{cyclo} \cdot \left(\dfrac{z_O}{A_O}\right)^2$ $E_O = 78.75 \cdot MeV$

(c) $A_O := 18$ $z_O := 8$ $E_O := A_O \cdot K_{cyclo} \cdot \left(\dfrac{z_O}{A_O}\right)^2$ $E_O = 124.444 \cdot MeV$