

(6.5) What is the range of a 6.3 MeV α -particle in (a) aluminum, (b) nickel, (c) platinum?

Use eqn. (6.11)

(a) aluminum (it is also possible to read off the range in Al from Fig. 6.6)

$$E_{\alpha} := 6.3 \text{ MeV} \quad A := 27 \quad R_{Al} := 0.173 \cdot E_{\alpha}^{\frac{3}{2}} \cdot A^{\frac{1}{3}} \cdot \frac{mg}{cm^2} \quad R_{Al} = 8.207 \cdot \frac{mg}{cm^2}$$

$$\rho_{Al} := 2.70 \cdot gm \cdot cm^{-3} \quad d_{Al} := \frac{R_{Al}}{\rho_{Al}} \quad d_{Al} = 0.030 \cdot mm$$

$$\text{(b) nickel} \quad A := 59 \quad R_{Ni} := 0.173 \cdot E_{\alpha}^{\frac{3}{2}} \cdot A^{\frac{1}{3}} \cdot \frac{mg}{cm^2} \quad R_{Ni} = 10.650 \cdot \frac{mg}{cm^2}$$

$$\rho_{Ni} := 8.9 \cdot gm \cdot cm^{-3} \quad d_{Ni} := \frac{R_{Ni}}{\rho_{Ni}} \quad d_{Ni} = 0.012 \cdot mm$$

$$\text{(c) platinum} \quad A := 195 \quad R_{Pt} := 0.173 \cdot E_{\alpha}^{\frac{3}{2}} \cdot A^{\frac{1}{3}} \cdot \frac{mg}{cm^2} \quad R_{Pt} = 15.864 \cdot \frac{mg}{cm^2}$$

$$\rho_{Pt} := 21.45 \cdot gm \cdot cm^{-3} \quad d_{Pt} := \frac{R_{Pt}}{\rho_{Pt}} \quad d_{Pt} = 0.0074 \cdot mm$$