

(6.2) What is the minimum energy that an alpha particle must have to be detected by a GM tube having a mica (the density is approximately equal to aluminum) window of 1.5 mg cm^{-2} .

$$A_Z := 27 \quad R_Z := 1.5 \text{ mg/cm}^2$$

The solutions shown here are based on eqn. (6.11). $R_Z = 0.173 \cdot E^2 \cdot A_Z^{\frac{1}{3}}$ mg/cm^2

This equation can be solved directly for the alpha energy, E (in MeV). First square both sides of the equation. Then move E^3 to the left side and everything else to the right side. Finally take the 3rd root of both sides:

$$E := \sqrt[3]{\frac{R_Z^2}{0.173^2 \cdot \left(A_Z^{\frac{1}{3}}\right)^2}} \quad E = 2.029 \quad \text{MeV}$$