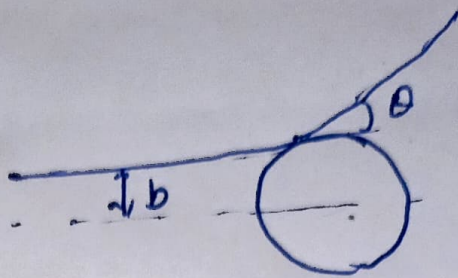


Q) What is the impact parameter at which the scattering angle is 90° of $Z=79$ and alpha particle of kinetic energy of 10 MeV.

Solⁿ :-

$$\theta = 90^\circ$$

$$E = 10 \text{ MeV}$$



$$b = \frac{1}{4\pi\epsilon_0} \times \frac{Ze^2}{E_k} \times \cot(\theta/2)$$

$$b = (9 \times 10^9) \times 79 \times (1.6 \times 10^{-19})^2 \times \cot(45^\circ) \times \frac{1}{E_k}$$

$$E_k = 10 \text{ MeV} = 10 \times 10^6 \times 1.6 \times 10^{-19} \text{ J}$$

Putting in above eqⁿ and we get

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$$b = 1137.6 \times 10^{17} \text{ m}$$