

$$\lambda = \frac{h}{\sqrt{2mk.E}}$$

$$\text{as } T = \frac{2}{3k} \langle K.E \rangle$$

$$\langle K.E \rangle = \frac{3KT}{2}$$

$$\lambda = \frac{h}{\sqrt{2m \times 3KT/2}}$$

$$\Rightarrow \lambda = \frac{h}{\sqrt{3KTm}}$$

$$\text{If } \frac{V_1}{V_2} = \frac{2}{4}, \quad \frac{\lambda_1}{\lambda_2} = ? \quad \lambda = \frac{1}{\sqrt{V}}$$

$$\frac{\lambda_1}{\lambda_2} = \sqrt{\frac{V_2}{V_1}} = \sqrt{\frac{4}{2}} = \sqrt{2}$$

$$\text{If } K.E_2 = 4K.E_1 \quad \frac{\lambda_1}{\lambda_2} = \sqrt{\frac{K.E_2}{K.E_1}} = \sqrt{\frac{4K.E_1}{K.E_1}} = \frac{2}{1}$$

$$\text{what } \frac{\lambda_\alpha}{\lambda_p} = ? \quad \frac{h}{\sqrt{2(4mp) \times (2ep)}} \div \frac{h}{\sqrt{2(mp)(ep)}} = \frac{1}{\sqrt{4 \times 2}} \div 1$$

$$\frac{\lambda_\alpha}{\lambda_p} = \frac{1}{\sqrt{2}}$$

$$\text{If } K.E_\alpha = K.E_p \quad \text{what } \frac{\lambda_\alpha}{\lambda_p} = \frac{\frac{h}{\sqrt{2(4mp)(K.E)}}}{\frac{h}{\sqrt{2mp(K.E)}}} = \frac{1}{2}$$

$$\lambda_\alpha = \lambda_p \text{ de-broglie}$$

$$\hookrightarrow \text{conditions} \rightarrow \frac{h}{\sqrt{2 \times 4mp \times V' \times 2ep}} = \frac{h}{\sqrt{2mp Vep}} = \left(\frac{1}{\sqrt{8V'}}\right)^2 \left(\frac{1}{\sqrt{V}}\right)^2 = V' = \frac{V}{8} \times 1$$

$$\hookrightarrow \text{condition} \rightarrow V' = \frac{1}{2} \times \frac{V}{8} \Rightarrow V' = \frac{V}{32}$$

$$\lambda_\alpha = 3\lambda_p \hookrightarrow \text{condition} \rightarrow V' = \left(\frac{1}{3}\right)^2 \times \frac{V}{8} \Rightarrow V' = \frac{9V}{72}$$

$$* \boxed{V' = (\text{factor})^2 \times \frac{V}{8}} \leftarrow \text{short cut.}$$

$$\boxed{V' = \frac{1}{(\text{factor})^2} \times \frac{V}{8}}$$