

Atomic Units - Calculation of Length -
 follows from "typical kinetic energy ~ typical potential energy"
 "Blackboard" picture

$$E = T + V$$

$$\frac{p^2}{2m} \rightarrow \frac{(\hbar k)^2}{2m} \rightarrow \frac{\hbar^2}{2m a_0^2}$$

$\left(-\frac{Ze^2}{r}\right)$ $\frac{1}{4\pi\epsilon_0}$ 1

$$\left[\begin{array}{l} e^{ikx} \\ \cos(kx) \\ k = \frac{2\pi}{\lambda} \\ \hbar = \frac{h}{2\pi} \end{array} \right]$$

typical $k \sim \frac{1}{a_0}$

$$\frac{e^2}{a_0} = \frac{\hbar^2}{m a_0^2}$$

$$a_0 = \frac{\hbar^2}{m e^2}$$