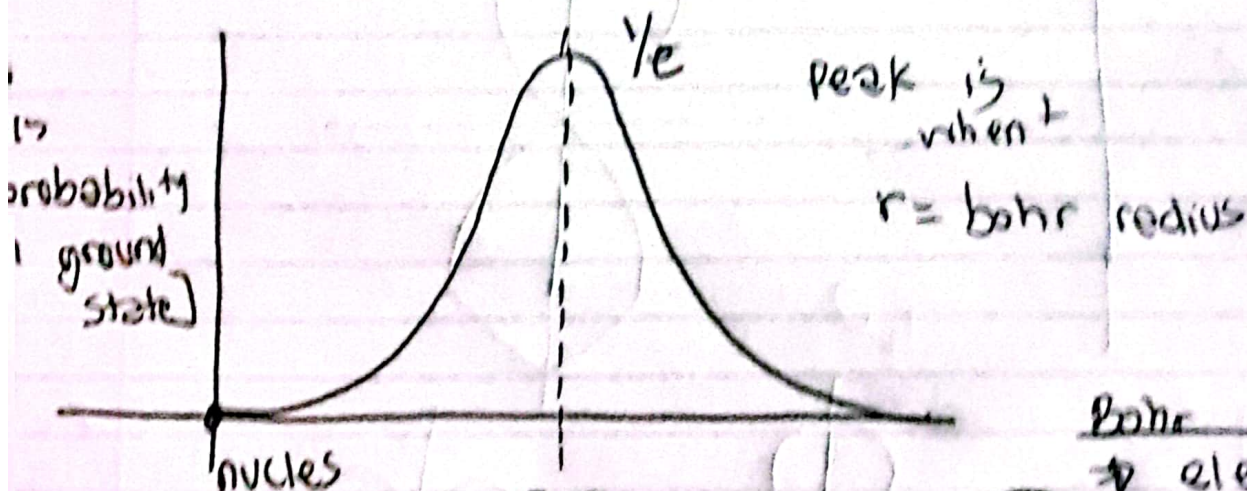
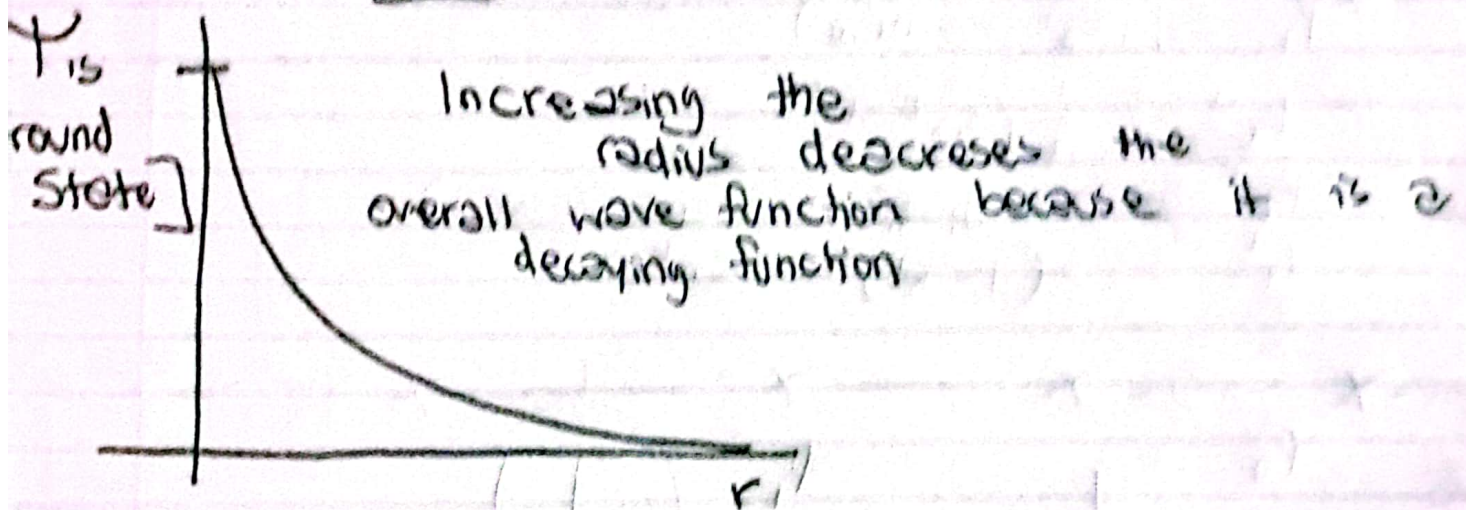


$$\Delta x \Delta p \geq \frac{\hbar}{2}$$

hydrogen atom plot orbital 1s

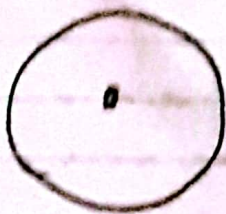
ψ_{100} [ground state]

$$\psi_{1s} \left[\frac{1}{\sqrt{\pi a^3}} e^{-r/a} \right]; a = \text{Bohr radius}$$



$r=0$
↓
nucleus

$r=a$
[bohr radius]



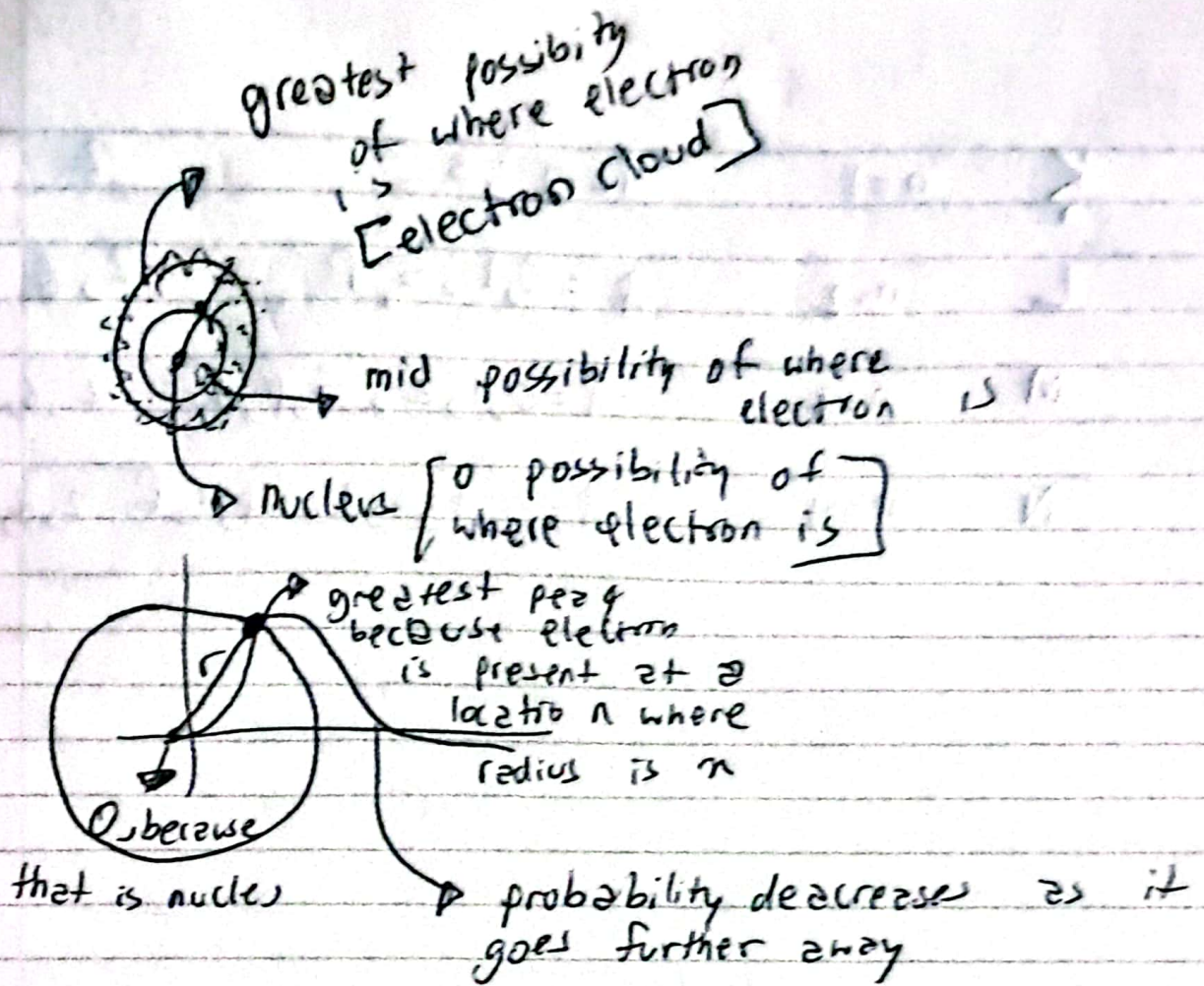
Bohr model's state that both position & momentum are known but due to "probability" ^{thru} either of them are known.

Bohr model

→ electron spins around nucleus



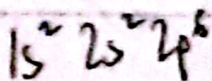
violates the Heisenberg uncertainty



Note

- In ground state, wave function is symmetric in the S orbit
- densest [peak possibility] portion of e^- is called orbit / shell
- $E_n = -\frac{13.6 \text{ eV}}{n^2}$ higher n : higher overall energy
- subshells or orbitals depend on orbital quantum number

$$n=1 \quad l=0 : s \quad n \text{ of } e^- = 2$$



$$s \rightarrow 2 \\ p \rightarrow 6$$

$$d =$$

K	$n=1$	$l=0; s$	2	2
L	$n=2$	$l=0, 1; s, p$	2, 6	8
M	$n=3$	$l=0, 1, 2; s, p, d$	2, 6, 10	18
N	$n=4$	$l=0, 1, 2, 3; s, p, d, f$	2, 6, 10, 14	32