Heisenberg Uncertainty Principle: De-Broglie

Proposed That The mothon of a particle with a welocity way controlled by wave packet with a group velocity vg.

Yg = dw

Yg = dw He further suggested that There is a limit beyond which we can not determine simultaneously both The momentum and The position of the particle. This is known as uncertainty The uncertainty is momentum up and uncertainty in position Dx b = h DX OPx >h Similarly OJDA > h DJ -> uncertainty in angular momentum

op -> uncertainty in angular position DE Od 7h DE -> uncertainty in energy of the uncertainty in sme.

Date_/_/ * Application of Uncertainty principle:
and problems to the second of
(i) Non-existance of free electrons in The Nucleus:
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1→ The maximum kinetic energy of an electron emitted by radio-active nuclei is 4 MeV.
emitted by radio-active nuclei u 4 MeV.
2- Rest mall of 0- in m= 9.11×10-31/cg
3- And Diameter of muclous - 2x15-14m
2- Rest mass of e- is mo = 9.11 x/o-31/cg 3- Diameter of nucleus = 2x/o-14m.
I de America la lache la mancala a de la lacios de
If the e-exist in the nucleus, it can be anywhere within the diameter of the nucleus. Therefore maximum uncertainty ox in position of the e- u same as the diameter of the nucleus.  DX = 2x10-14 m.
anywhere within the diameter of the nucleus.
Therefore. Therefore maximum uncertainty nx
in position of The e- 4 same as The diameter
of the nucleus.
$\Delta x = 2 \times 10^{-14} \text{ m}.$
A/c to Heisenberg Uncertainty poinciple
DX. DPx >, hEx
DPZ > 10
The minimum uncertainty in momentum is
given by
$Ab_1 = b_1 - b_2$
$\Delta p_{x} = \frac{b}{2Ax} = \Delta p_{x} = \frac{b}{Ax}$
A E - 2 Mason foundy in sweety.
is a basis of the same of the same
$\mathbb{W}$

$$\Delta \beta_{x} = \frac{1.0534 \times 10^{-34}}{2 \times 10^{-19}} \quad \beta = 1.056 \times 10^{-34} \frac{\text{Memory of }}{2 \times 10^{-19}}$$

$$\Delta \beta_{x} = 5.28 \times 10^{-21} \quad \text{kg.m/sec.}$$
The kinetic energy of the mass 
$$K.f. = \frac{p^{2}}{2m} = \frac{(\Delta \beta_{x})^{2}}{2m_{0}}$$

$$[K.f. = 97 \text{ MeV}]$$
This mean that if the e-exist inside the nucleus their kinetic energy must be after order of 97 MeV. But no e-posses the energy greater than 4 MeV. Thus e-does not reside in the nucleus.

Radius of Bhor's first Drobit: If aq and ap are uncertainties in determining the position and momentum of e-in first orbit, then
$$\Delta x \Delta \beta \cong b$$

$$\Delta b = \frac{b}{\Delta x}$$
The uncertainty in k.f. may be calculated as follows
$$T = K.f. = \frac{p^{2}}{2m}$$
uncertainty in K.f. of e-
$$\Delta T = \frac{(\Delta \beta)^{2}}{2m} = \frac{1}{2m} \left(\frac{K}{\Delta x}\right)^{2}$$

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Date_/_/_ The polential energy of e is
$V = \frac{1}{4\pi60} \frac{(Ze)(e)}{(\Delta x)} = \frac{1}{4\pi60} \frac{Ze^2}{\Delta x}$
Uncertainty in to tal energy;
DE = DT + DY
$DE = \frac{k^2}{2m(Dx)^2} - \frac{1}{4\pi G} \frac{Ze^2}{Dx}$
for minimum or maximum value of E, dE =0
$\frac{d(\Delta E)}{d(\Delta x)} = -\frac{h^2 2}{2m(\Delta x)^3} + \frac{1}{4n\epsilon_0} \left(\frac{Ze^2}{(\Delta x)^2}\right) = 0$
$DX = U \pi G \frac{h^2}{m Z e^2}$
$DX = Q / e_0 \frac{1}{\sqrt{2}}$
Radius of Bohr's first orbit
$ \gamma = \Delta x = 4\pi \epsilon_0 \frac{h^2}{m Ze^2} \qquad h = \frac{h}{2\Lambda} $
to R2
$r = \frac{c}{\sqrt{m} Ze^2}$
The uncertaint to be in may be a dated
as to the as 10 E = 1/2 m
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