The function wave depending on the time :

The function ψ(x,y,z) in polar coordinates ψ(r,θ,ϕ) = R(r).Y(θ,ϕ)

To isolate the energy of the equation of Schrödinger , it is necessary to deduce R(r) and

Y(θ,ϕ) separately and then multiply it ; we will obtain the sum of energies in the " eigenvalue " (otherwise called "eigenvalue"):

(The " fraction " of energy corresponding to the translation we do not consider it).

$(\frac{m}{2})[\dot{r}^2 + r^2.\dot{\theta}^2 + r^2.Sin^2\theta.\dot{\phi}^2]=E_{total}$

vibration R(r) where r $\neq ctnt$ — rotation Y(θ,ϕ), which dissociates in ϕ (θ) and Θ(θ, ϕ) and where r= ctnt .

$$\hat{H}.\psi(\mathrm{r}, \theta, \phi) = E.\psi(\mathrm{r}, \theta, \phi)$$

First we will consider that all 3 variables r, θ, ϕare time dependent, then ψ(t)= r(t).θ (t). ϕ(t), then

$-\frac{\hbar}{i}\frac{d\psi(t)}{dt}$ =ψ(t)E , r(t), θ(t), ϕ(t), are derived separately and are cumulative

$\frac{-\hbar}{i}\dot{r} = E_1.r$ $(\frac{-\hbar}{i})^2.\dot{r}^2$=$E_1{}^2.r^2$ $\dot{r}^2$=(2/m) $^2.r^2.(\frac{-i}{\hbar})^2$

r(t)=$e^{\frac{-i}{\hbar}.t.(2/m)}$

on the other hand, we have $\frac{-\hbar}{i}\frac{d\theta(t)}{dt}$= E_2.θ(t) ,

$\dot{\theta}^2$= $E_2{}^2$.θ $^2.(\frac{-i}{\hbar})^2$ $\dot{\theta}^2$ =(2 /(mr ^{2})) ^{2}.θ ^{2}

θ(t)=$e^{\frac{-i}{\hbar}.t.[2/(\mathrm{m}.r^2)]}$

And finally $\frac{-\hbar}{i}\frac{d\phi}{dt} = E_3.\phi(t)$

$\dot{\phi}^2 = \left(\frac{2}{m.r^2.Sin^2\theta}\right)^2 .\phi^2 . \frac{-\hbar}{i}\,(\frac{-i}{\hbar})^2$ $\quad \phi(t) = e^{-i.t\frac{[\frac{2}{m.r^2 Sin^2\theta}]}{\hbar}}$

All the ψ's agree on the same energy ($E_{total} = E_r + E_\theta + E_\phi$) coming from them.

I don't know if we can say that: $\frac{d\psi(t)}{dt} = \dot{r}\theta\phi + r\dot{\theta}\phi + r\theta\dot{\phi}$?