Modelo atómico de Schrödinger y orbitales atómicos

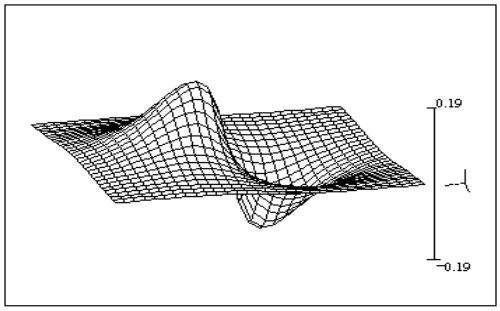
Ecuación de Schrödinger:es el equivalente cuántico a la conservación de la energía mecánica clásica

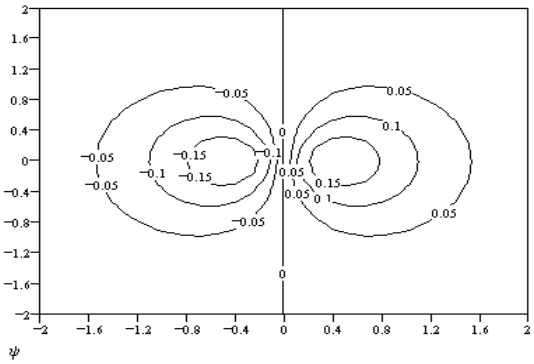
$$H|\psi(x)\rangle = E|\psi(x)\rangle$$

$$-\frac{\hbar^2}{2\,m}\left(\frac{\partial^2\,\Psi}{\partial x^2}+\frac{\partial^2\,\Psi}{\partial y^2}+\frac{\partial^2\,\Psi}{\partial z^2}\right)+V(r)\,\Psi=E\,\Psi$$

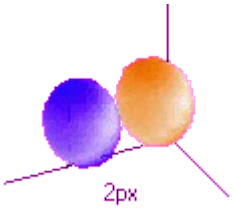
Operador hamiltoniano (H): equivalente cuántico a la suma de las energías cinética y potencial clásica.

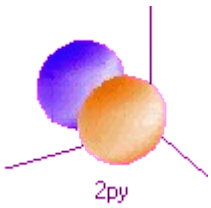
Función de onda $2p_z$

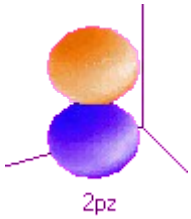




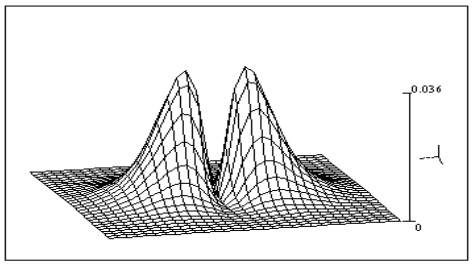
Orbitales p

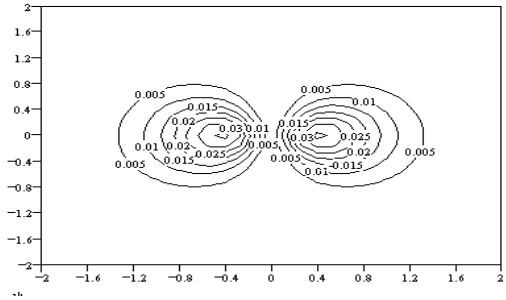


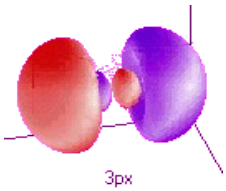


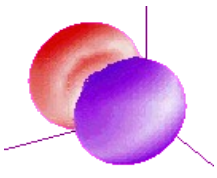


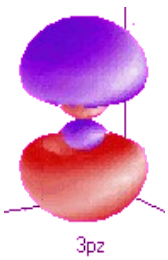
Vistas de la función de densidad de probabilidad, Ψ^2 en el plano XY de un orbital $2p_z$





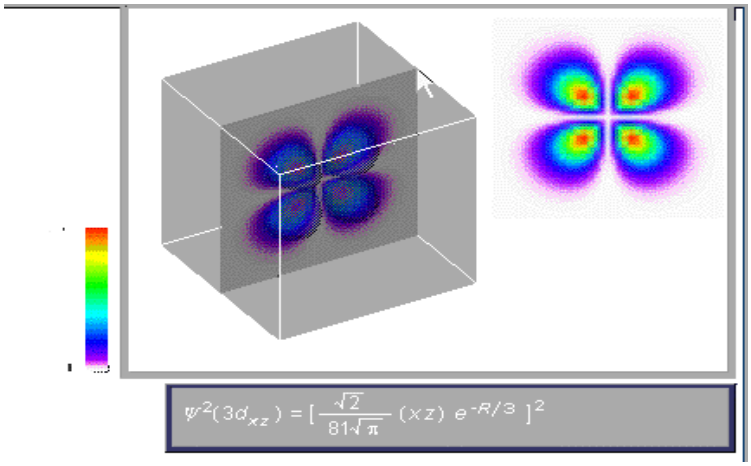




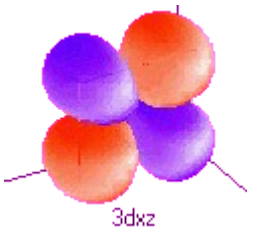


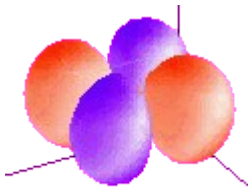
Vistas de la función de densidad de probabilidad, Ψ^2 de un orbital 3dxz

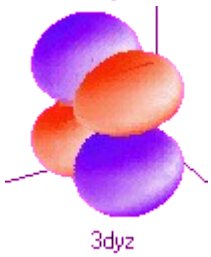
$$\Psi(3d_{xz}) = \frac{\sqrt{2}}{81\sqrt{\pi}} (x\,z)\, e^{-R/3}$$

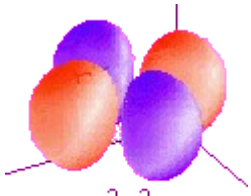


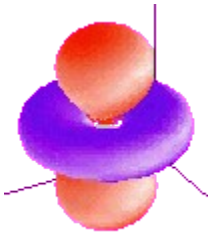
Orbitales d:

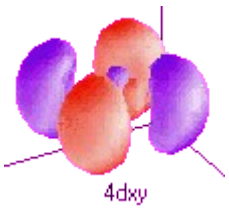

3dxz

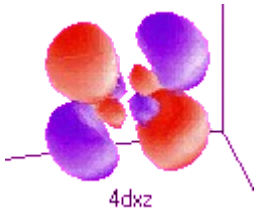

3dxy

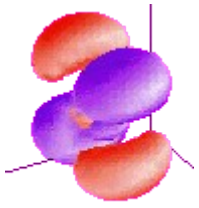

3dyz

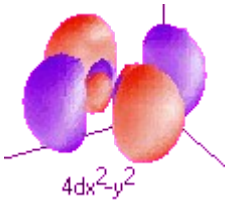

$3dx^2-y^2$

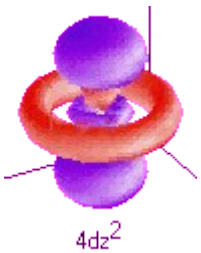

$3dz^2$


4dxy

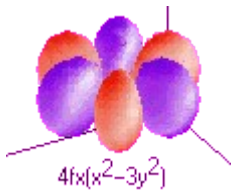

4dxz

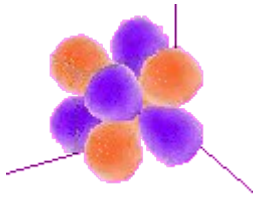

4dyz

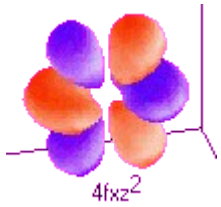

$4dx^2-y^2$


$4dz^2$

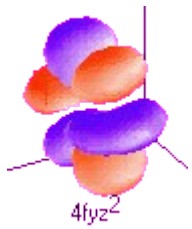
Orbitales f:

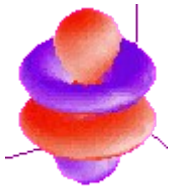

$4fx(x^2-3y^2)$


4fxyz


$4fxz^2$


$4fy(3x^2-y^2)$


$4fyz^2$


$4fz^3$


$4fz(x^2-y^2)$