

1.- Es la energía mínima en el nivel $n=1$ que conserva la partícula no puede ser 0.

2. $l_{v2} = 794 \text{ nm}$ pasa de $n=2$ a $n=1$
 Encuentre L (longitud del pozo)

$$\Rightarrow E_n = n^2 \left(\frac{h^2}{8meL^2} \right)$$

$$E = \frac{1240}{794 \text{ nm}} = 1.56 \text{ ev} = 2.49 \times 10^{-19} \text{ J}$$

$$\Rightarrow L = \sqrt{\frac{h^2}{8meE}}$$

$$\Rightarrow L = \frac{h}{\sqrt{8meE}} = \frac{6.626 \times 10^{-34}}{\sqrt{3(9.11 \times 10^{-31})2.49 \times 10^{-19}}} = \frac{6.626 \times 10^{-34}}{\sqrt{(7.28 \times 10^{-30})2.49 \times 10^{-19}}}$$

$$= \frac{6.626 \times 10^{-34}}{\sqrt{1.814 \times 10^{-48}}} = \frac{6.626 \times 10^{-34}}{1.3468 \times 10^{-24}} = \underline{\underline{4.9198 \times 10^{-10}}}$$

$$3 \quad E_T = 4.5 \text{ eV} \quad U = 5.0 \text{ eV} \quad L = 9.5 \text{ Å} \Rightarrow 1 \text{ Å} = 1 \times 10^{-10} \text{ m}$$

$$9.5 \text{ Å} = 9.5 \times 10^{-10} \text{ m}$$

$$\Rightarrow T = e^{-2CL}$$

$$C = \frac{\sqrt{2m(U-E)}}{\pi^2} \Rightarrow \frac{\sqrt{2(9.10 \times 10^{-31})(5 - 4.5)}}{1.054 \times 10^{-34}} \text{ eV}$$

$$\hbar = \frac{h}{2\pi} = \frac{6.626 \times 10^{-34}}{2\pi}$$

$$\Rightarrow \frac{\sqrt{(1.82 \times 10^{-30})(8.01 \times 10^{-4} - 7.20 \times 10^{-19})}}{1.054 \times 10^{-34}}$$

$$8.01 \times 10^{-4} = 8.01 \times 10^{-19}$$

$$7.20 \times 10^{-19}$$

$$\Rightarrow \frac{\sqrt{(1.82 \times 10^{-30})(8.1 \times 10^{-20})}}{1.054 \times 10^{-34}} = \frac{\sqrt{1.4742 \times 10^{-49}}}{1.054 \times 10^{-34}} = \frac{3.8395 \times 10^{-25}}{1.054 \times 10^{-34}} = 3.6428120996$$

$$= 3.6428 \times 10^9$$

$$\Rightarrow -2C = -7.2856 \times 10^9$$

$$\Rightarrow -2CL = (-7.2856 \times 10^9)(9.5 \times 10^{-10} \text{ m}) = -6.92132$$

$$e^{-2CL} = \exp(-6.92132) = 0.00098 = \underline{0.098\%}$$

$$0.98 \times 10^{-3}$$

$$4^{\circ} \Psi = A \times e^{-x^2/L^2}$$

$$E_T = E_C + E_P = 0$$

$$E_C = \frac{1}{2} m v^2$$

$$mv = \frac{hK}{2\pi} \rightarrow v = \frac{hK}{2m\pi}$$

$$P = \frac{n}{\pi} = mv = \frac{h}{2\pi} \frac{k}{K}$$

$$E_C = -E_P \quad \Psi = A \times e^{Kx}$$

$$k = \frac{2\pi}{L}$$

$$\lambda = \frac{2\pi}{k}$$

$$K = \frac{1}{L^2}$$

$$E_C = \frac{1}{2} m \left(\frac{hK}{2\pi m} \right)^2$$

$$= \frac{1}{2} m \left(\frac{hK}{m} \right)^2$$

$$= \frac{1}{2} m \left(\frac{h^2 K^2}{m^2} \right) = \frac{h^2 K^2}{2m}$$

$$E_C = -E_P \rightarrow E_P = -\frac{h^2 K^2}{2m} = -\frac{h^2}{2m} \left(-\frac{1}{L^2} \right)$$

$$\therefore = \frac{h}{2m L^2}$$

$$5) -\frac{\hbar^2}{2m} \frac{d^2}{dx^2} \psi + E \psi = E \psi \quad \psi = 0 \quad \psi = A e^{ikx}$$

$$-\frac{\hbar^2}{2} \frac{d^2}{dx^2} \psi = E \psi$$

$$\begin{aligned} \frac{d}{dx} \psi &= \frac{d}{dx} (A (\cos(kx) + i \sin(kx))) \\ &= A (-k \sin(kx) + k \cos(kx)) \end{aligned}$$

$$\frac{d^2 \psi}{dx^2} = A (-k^2 \cos(kx) - k^2 i \sin(kx)) = -Ak^2 e^{ikx}$$

$$-\frac{\hbar^2}{2m} (-Ak^2 e^{ikx}) = E \psi \quad -\frac{\hbar^2 k^2}{2m} (\psi) = E \psi \quad E = \frac{\hbar^2 k^2}{2m}$$

$$E_C = \frac{1}{2} m v^2, \quad v = \frac{\hbar k}{2m\tau}$$

$$E_C = \frac{1}{2} m \left(\frac{\hbar k}{m\tau} \right)^2 = \frac{1}{2} \left(\frac{\hbar^2 k^2}{m^2 \tau^2} \right) \rightarrow = \frac{\hbar^2 k^2}{2m \tau^2}$$