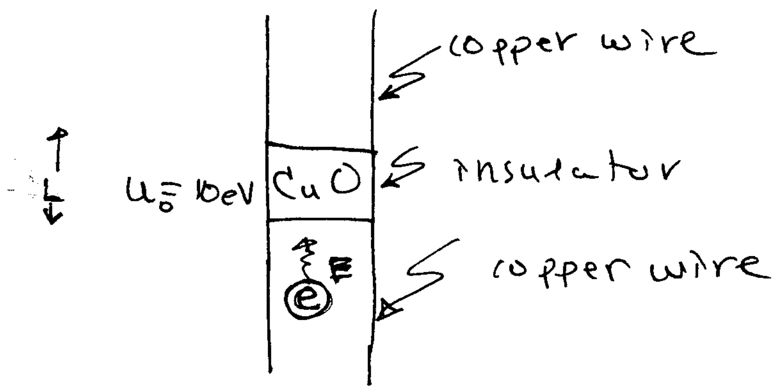
The result for the transmission coefficient "T" is:

$$T(E) = \left\{ 1 + \frac{1}{4}\left[\frac{U_0^2}{E(U_0 - E)}\right] \sinh^2(\alpha L) \right\}^{-1}$$

$$T = \frac{|F|^2}{|A|^2}$$

$$\sinh x = \frac{1}{2}\left(e^{x} - e^{-x}\right)$$

Ex. Two copper conducting wires are separated by an insulating oxide layer (CuO).



a) Calculate "T" for electrons with $E = 7.00eV$ and layer thickness $L = 5.00$ nm. if $U_0 = 10eV$.

$$\alpha = \sqrt{\frac{2m}{\hbar^2}(U_0 - E)} = \sqrt{\frac{2(9.11 \times 10^{-31} kg)}{(1.055 \times 10^{-34} J \cdot s)^2}\left(10eV - 7eV\right) \times (\ldots}$$

$$\alpha = 0.8875 \times 10^{-10} m^{-1} = 0.8875 \text{ Å}^{-1}$$

$$T = \left\{ 1 + 0.25\left[\frac{100}{7(3)}\right] \sinh^2\left(0.8875 \times 10^{-10}\right)\left(5 \times 10^{-T} m\right) \right\}^{-1}$$

$$T = 0.963 \times 10^{-38}$$

b) For $L = 1nm$

$$T = 0.657 \times 10^{-7}$$