$$m_p^* = \frac{\hbar^2}{2C_2}$$

$$\frac{m_p^*}{m_0} = \frac{\hbar^2}{2m_0C_2}$$

$$E - E_v = -C_2k^2$$

$$(E_v - 1.2 - E_v)(1.6\times10^{-19}) = -C_2(0.2\times10^{10})^2$$

$$C_2 = 4.8\times10^{-38}$$

$$1.92\times10^{-19} = -C_2(0.2\times10^{10})^2$$

$$= \frac{(1.054\times10^{-34})^2}{2(9.11\times10^{-31})(4.8\times10^{-38})}$$

$$= 0.127$$

$$1 - f_F(E) = 1 - \frac{1}{1 + \exp\left(\frac{E - E_F}{KT}\right)}$$

$$E = E_F - 0.2eV$$

$$= 6.25 - 0.2eV$$

$$= 6.05$$

$$0.05 = 1 - \frac{1}{1 + \exp\left(\frac{6.05 - 6.25}{KT}\right)}$$

$$0.95 = \frac{1}{1 + \exp\left(\frac{-0.2}{KT}\right)} \Rightarrow 1 + \exp\left(\frac{-0.2}{KT}\right) = \frac{1}{0.95}$$

$$\exp\left(\frac{0.2}{KT}\right) = 95 \qquad \frac{0.2}{KT} = \ln(95$$

$$T = \frac{0.04391862}{1.3806 \times 10^{-23}} = \boxed{3.18 \times 10^{21}} \qquad KT = \frac{0.2}{\ln(95)}$$

This is my

Signature for the Last Part

Roger Bennett

[illegible] m. [illegible] 09/23/21