

Tarea 3

P. 3.1, 3.2, 3.3, 3.4, 3.6

3.1)

$$n = 10^{12}$$

$$l = 0.02 \text{ m}$$

$$N_L = N_0 e^{-\mu L}$$

$$\rho = 11.3 \text{ E}3 \text{ kg/m}^3$$

$$\mu = \rho 1 \text{ E}^{-3} \text{ m}^{-1}, \rho 3 \text{ E}^{-4} \text{ m}^{-1}, \rho 1 \text{ E}^{-4} \text{ m}^{-1}$$

$$N_{L1} = 4.786 \text{ E}13, 4.644 \text{ E}13, 3\%$$

$$N_{L2} = 5.607 \text{ E}13, 5.593 \text{ E}13, 0.25\%$$

$$N_{L3} = 5.866 \text{ E}13, 5.864 \text{ E}13, 0.03\%$$

3.2)

$$\frac{1}{\mu} = \text{Relaxation length.}$$

$$\frac{1}{\mu_1} = \frac{1}{11.3 \text{ m}^{-1}} = 0.0885 \text{ m}$$

$$\frac{1}{\mu_2} = \frac{1}{339 \text{ m}^{-1}} = 0.295 \text{ m}$$

$$\frac{1}{\mu_3} = \frac{1}{113 \text{ m}^{-1}} = 0.885 \text{ m}$$

3.3)

$$a) \quad N_L = N_0 e^{-(\mu_1 + \mu_2 + \mu_3)L}$$

$$N_L = 4.373 E 13$$

b)

$$\Delta N = N_0 - N_L = 47.642 E 13$$

$$\Delta N_1 = \Delta N \frac{\mu_1}{\mu} = 1.162 E 13$$

$$\Delta N_2 = \Delta N \frac{\mu_2}{\mu} = 3.49 E 12$$

$$\Delta N_3 = \Delta N \frac{\mu_3}{\mu} = 1.16 E 12$$

3.4)

$$a) \quad \langle \mu / \rho \rangle = \sum_i \frac{\mu_i \rho_i}{i} = 4.67 E -4 m^2/kg$$

b)

$$\frac{R_L}{R_0} = e^{-\mu_m L}$$

$$- \ln \left(\frac{R_L}{R_0} \right)^L = \mu$$

$$\langle \mu / \rho \rangle = \mu / \langle \rho \rangle = 3 E -4 m^2/kg$$

3.6)

$$a) \quad B = \frac{3.956 g}{3.406 g} = 1.1617$$

b)

$$- \ln \left(\frac{\psi_L}{\psi_0 B} \right) = \mu = 2.295 /m$$

$$\bar{\mu}' = \mu - \frac{\ln B}{L} = 1.976 /m$$