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"Electronica Analogia"

2CM18

1-Calcular la concentración de portadores intrínsecos para el arseniuro de Galia a 31°C.

Datos

$B = 2.10 \times 10^{14}$

$T = 273 + 31 = 304$

$\varepsilon_g = 1.4$

$$n_i = BT^{\frac{3}{2}} e^{-\frac{\varepsilon_g}{2kT}}$$

$k = 86 \times 10^{-6}$

$$n_i = (2.10 \times 10^{14})(304)^{\frac{3}{2}} e^{-\frac{1.4}{2(86\times10^{-6})(304)}}$$

$$n_i = (2.10 \times 10^{14})(5300.421115) e^{-26.7747858}$$

$$n_i = (2.10 \times 10^{14})(5300.421115)\, 2.354280862 \times 10^{-8}$$

$$n_i = (2.10 \times 10^{14})(1.247867999) \times 10^{-8}$$

$$n_i = 2.620522.798 \times 10^{-6}\ cm^3$$

2-Calcular la concentración de portadores intrínsecos para el Germanio a 24°C.

$$n_i = BT^{\frac{3}{2}} e^{-\frac{\varepsilon_g}{2kT}}$$

$k = 86 \times 10^{-6}$

Datos

$B = 1.66 \times 10^{15}$

$T = 273 + 24 = 297$

$\varepsilon_g = 0.66$

$$n_i = (1.66 \times 10^{15})(297)^{\frac{3}{2}} e^{-\frac{0.66}{2(86\times10^{-6})(297)}}$$

$$n_i = (1.68 \times 10^{15})(5118.4053) e^{-12.91498}$$

$$n_i = (1.68 \times 10^{15})(5118.4053)\, 2.449075581 \times 10^{-6}$$

$$n_i = 2.105940 \times 10^{13}\ cm^3$$