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PHY350 Lab Report

Practical: 8   Registration No.: 11912610   Section: G2903

Aim

To measure the hall coefficient and carrier concentration of a semiconductor sample.

Results & Conclusions

For the chosen 0.5mm thickness Ge sample, the hall coefficient was found to be $R_H = 0.01939$ and the carrier concentration was $n = 3.221 \times 10^{20}$.

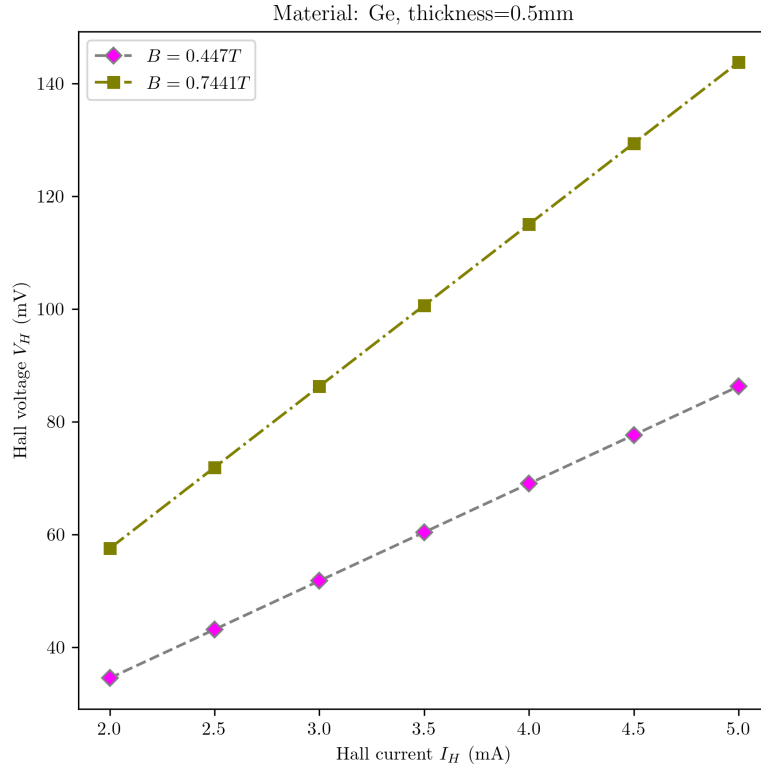The data has been plotted in the figure below.

Figure 1: Plot of hall voltage vs current

The values measured are as follows
Since the hall voltage and hall current are related by

$$V_H = \frac{R_H I B}{t}$$

Hall current	V_H $(B = 0.4447)$	V_H $(B = 0.7441)$
2.0	34.507	57.511
2.5	43.133	71.889
3.0	51.760	86.267
3.5	60.387	108.645
4.0	68.014	115.625
4.5	77.640	129.4
5.0	86.267	143.778

Table 1: Measurements for Ge, thickness=0.5mm

where

$$R_H = \pm \frac{1}{ne}$$

The values for R_H and n could be estimated from the slope of the data.

The calculated values of R_H and carrier concentration n are 0.01939 and 3.221×10^{20} respectively.