**Hall Effect**

**Observation Table:**

Material: Germanium

Magnetic field B = 0.447 gauss = \_\_\_\_\_\_\_\_\_\_ tesla

|  |  |  |  |
| --- | --- | --- | --- |
| Thickness t = 0.4 mm | | Thickness t = 0.8 mm | |
| IH mA | VH mV | IH mA | VH mV |
| 1 |  | 1 |  |
| 1.5 |  | 1.5 |  |
| 2 |  | 2 |  |
| 2.5 |  | 2.5 |  |
| 4 |  | 4 |  |
| 3.5 |  | 3.5 |  |
| 4 |  | 4 |  |
| 4.5 |  | 4.5 |  |
| 5 |  | 5 |  |

**Graph:**

Plot Hall voltage (Y-axis) v/s Hall current (X-axis) for different thicknesses

**Formula:** carrier concentration

**Home Assignment:**

Keep Hall current (IH) fixed at 3 mA. Vary Magnet current in steps of 0.5 A and note Hall voltage. Plot graph of Hall voltage (Y-axis) v/s Magnetic field\* for any one thickness. Calculate carrier concentration using the formula:

\*Find magnetic field for different magnet currents by selecting “Magnetic field v/s Current” from the “Select Procedure” drop-down menu of the simulator.

Observation table for Home Assignment:

Material: Germanium

Hall current: 3 mA

|  |  |  |
| --- | --- | --- |
| Thickness t = 0.4 OR 0.8 mm | | |
| I ampere  (magnet current) | B gauss | VH mV |
| 1 |  |  |
| 1.5 |  |  |
| 2 |  |  |
| 2.5 |  |  |
| 4 |  |  |
| 3.5 |  |  |
| 4 |  |  |
| 4.5 |  |  |
| 5 |  |  |