

Hall effect in n-germanium with Cobra3 5.3.02-11



NEW

BEST
SELLERComputer assisted
Experiment
Cobra3

What you can learn about ...

- Semiconductor
- Band theory
- Forbidden zone
- Intrinsic conduction
- Extrinsic conduction
- Valence band
- Conduction band
- Lorentz force
- Magneto resistance
- Neyer-Neldel Rule

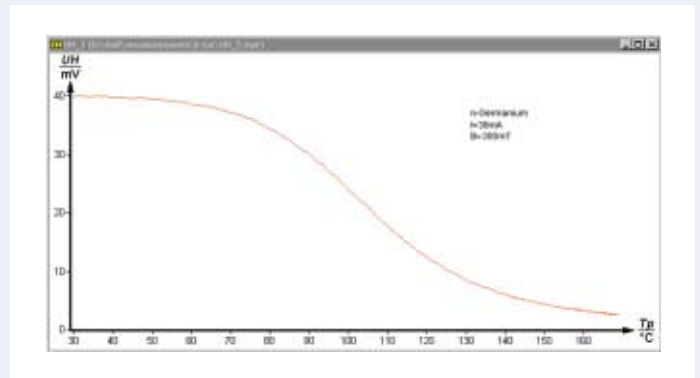
Principle:

The resistance and Hall voltage are measured on a rectangular strip of germanium as a function of the temperature and of the magnetic field. From the results obtained the energy gap, specific conductivity, type of charge carrier and the carrier mobility are determined.

What you need:

| | | |
|--|----------|---|
| Hall effect module, | 11801.00 | 1 |
| Hall effect, n-Ge, carrier board | 11802.01 | 1 |
| Coil, 600 turns | 06514.01 | 2 |
| Iron core, U-shaped, laminated | 06501.00 | 1 |
| Pole pieces, plane, 30×30×48mm, 2 | 06489.00 | 1 |
| Hall probe, tangent., prot. cap | 13610.02 | 1 |
| Power supply 0-12 V DC/6 V, 12 V AC | 13505.93 | 1 |
| Tripod base -PASS- | 02002.55 | 1 |
| Support rod -PASS-, square, $l = 250$ mm | 02025.55 | 1 |
| Right angle clamp -PASS- | 02040.55 | 1 |
| Connecting cord, $l = 100$ mm, red | 07359.01 | 1 |
| Connecting cord, $l = 100$ mm, blue | 07359.04 | 1 |
| Connecting cord, $l = 500$ mm, red | 07361.01 | 2 |
| Connecting cord, $l = 500$ mm, blue | 07361.04 | 1 |
| Connecting cord, $l = 500$ mm, black | 07361.05 | 2 |
| Cobra3 Basic Unit | 12150.00 | 1 |
| Power supply, 12 V | 12151.99 | 1 |
| Tesla measuring module | 12109.00 | 1 |
| Cobra3 Software Hall | 14521.61 | 1 |
| RS 232 data cable | 14602.00 | 2 |
| PC, Windows® 95 or higher | | |

Complete Equipment Set, Manual on CD-ROM included
Hall effect in n-germanium with Cobra3 P2530211



Hall voltage as a function of temperature.

Tasks:

1. At constant room temperature and with a uniform magnetic field measure the Hall voltage as a function of the control current and plot the values on a graph (measurement without compensation for error voltage).
2. At room temperature and with a constant control current, measure the voltage across the specimen as a function of the magnetic flux density B .
3. Keeping the control current constant measure the voltage across the specimen as a function of temperature. From the readings taken, calculate the energy gap of germanium.
4. At room temperature measure the Hall Voltage U_H as a function of the magnetic flux density B . From the readings taken, determine the Hall coefficient R_H and the sign of the charge carriers. Also calculate the Hall mobility μ_H and the carrier density n .
5. Measure the Hall voltage U_H as a function of temperature at uniform magnetic flux density B , and plot the readings on a graph.