

## Band gap of germanium 5.3.04-01



## What you can learn about ...

- Semiconductor
- Band theory
- Forbidden band
- Intrinsic conduction
- Extrinsic conduction
- Impurity depletion
- Valence band
- Conduction band

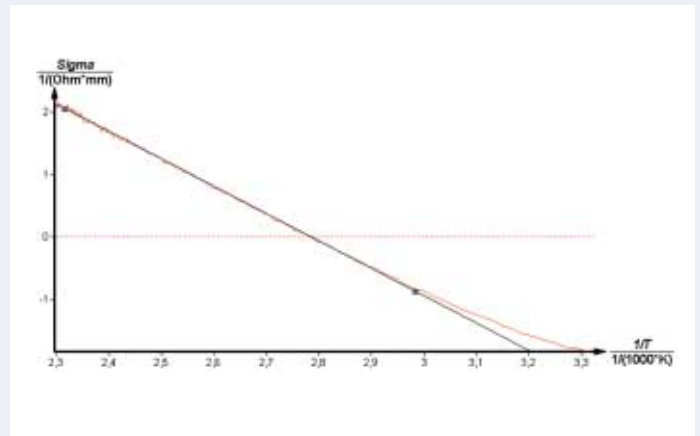
## Principle:

The conductivity of a germanium testpiece is measured as a function of temperature. The energy gap is determined from the measured values.

## What you need:

Hall effect module,	11801.00	1
Hall effect, undot.-Ge, carrier board	11807.01	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
Digital multimeter	07134.00	1
Connecting cord, $l = 500$ mm, black	07361.05	2
Connecting cord, $l = 100$ mm, red	07359.01	1
Connecting cord, $l = 100$ mm, blue	07359.04	1

**Complete Equipment Set, Manual on CD-ROM included**  
**Band gap of germanium P2530401**



Regression of the conductivity versus the reciprocal of the absolute temperature.

## Tasks:

1. The current and voltage are to be measured across a germanium test-piece as a function of temperature.
2. From the measurements, the conductivity  $\sigma$  is to be calculated and plotted against the reciprocal of the temperature  $T$ . A linear plot is obtained, from whose slope the energy gap of germanium can be determined.