FOUR PROBE APPARATUS

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Abstract

hello ! how are you my pussy kat we love pussy cat. and also dogs are man's best friends

I. Introduction

The purpose of 4 point probe method is to measure the resistivity of a semiconductor sample. The 4 probe setup consists of 4 equally spaced metal tips with finite radius. The tip is supported by springs on the other end to minimize excessive pressure on the metal. A high impedence current source is used to supply current through the outer probes. A voltmeter measures the voltage across the inner probes to determin the sample resistivity and hence, the energy band gap of the semiconductor sample. The sharp probes are placed on a

II. Apparatus

SK012 FOUR PROBE APPARATUS, Semiconductor sample.

III. Theory

The energy band gap E of a semiconductor is given by

$$E_g = \frac{2k \times 2.3026 \times log_{10}\rho}{T^{-1}} \quad eV$$

Where $k = 8.6 \times 10^{-5} \quad eV/deg$.
ρ is the resistivity of the semiconductor sample given by $\rho = \rho_0 / f(W/s)$

Where $\rho_0 = \frac{V \times 2\pi s}{I}$
W is the thickness of the sample.
s is the probe spacing.
f(W/s) function is the correction factor.
V is the voltage across the two inner probes.
I is the current across the two inner probes.

IV. Procedure

- Put the four probe arrangement in the oven and connect the lead of the oven to socket(10). Also insert a PT100 temperature sensor into the hole given at the top of the four probe arrangement.
- Conncet the red and black plug leads of the four probe arrangement to 4mm sockets marked as voltage V.
- Conncet the yello plug leads to 4mm sockets marked as current.
- Change swith to current mode to display the current reading.
- Switch on the apparatus and slightly increase the current using current knob, say 4mA and note that the voltage should be positive.
- Set the current to desired value say 8 mA using current adjusting knob. Also select the range of multiplier using switch to x1 or x10.
- Switch on the oven. Green LED will glow showing the oven is on.
- Change switch to temperature for display to show temperature reading.
- Note the probe voltage on display for different values of temperatures.

Table 1: *Example table*

Name		
First name	Last Name	Grade
John	Doe	7.5
Richard	Miles	2

V. Observations

- Current C = 8.03 mA
- Distance between probes S = 0.24 cm
- Thickness of sample W = 0.05 cm

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$$e = mc^2 \tag{1}$$

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VII. Discussion

i. Subsection One

A statement requiring citation [Figueredo and Wolf, 2009]. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies

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ii. Subsection Two

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References

[Figueredo and Wolf, 2009] Figueredo, A. J. and Wolf, P. S. A. (2009). Assortative pairing and life history strategy - a cross-cultural study. *Human Nature*, 20:317–330.