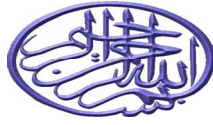


الاستهلال

قال تعالى:



{ قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ }

صدق الله العظيم

البقرة الآية 32

Dedication

To my mother
Un known soldier in our home
To my father
It is the greatest love that he holds
To science and knowledge
To my sisters and brother
To my teachers
To all my friends



Acknowledgement

Before of all, the praise and thanks be to Allah whom to be ascribed all perfection and majesty.

The thanks after Allah must be to my virtuous teacher Dr. Mubarak Dirar Abd Allah who supervised this reseach and guide me in patience until the results of this research are obtained.

I wish to express my thanks to the sudan university of science and technology, department of physics.

My gratitude is sent to Mr. Abd Alsakhi (Neelien university – department of laser physics).

My thanks, also must be sent to all my friends and classmates for any support that make me complete this research.



Abstract

In this work two light emitting diodes, two ordinary diodes, two light dependent resistors, beside two transistors are connected to a simple electric circuit. This circuit consists of a power supply, ammeter and voltmeter. Fifty (50) readings for voltage(mV) and current(mA) are taken.

A graph relating the current to the voltage is drawn for only one sample from each semiconductor type . It was found that for light emitting diode the current increases abruptly at about 0.2 Volt, while for the ordinary diode the change is at about 0.2 Volt. For light dependent resistor the change is about 0.2 Volt, where as it changes abruptly at about 0.4 Volt for transistors.

These may indicate the existence of energy gap. The value of the corresponding gaps are less than the ordinary values, which may result from heavy doping. The values of gaps indicates that the impurities are Cu and Fe.

The exposure of these sample to the heat increases the current which agrees with the fact that heat increases electron velocity. The exposure of samples to the magnetic field broadens the energy gap which agrees with some works.



ملخص البحث

في هذا العمل تم توصيل 2مقاومات ضوئية و2ثنائي مشع ضوئي و2 ثنائي عادي و2 ترانزستور بدائرة كهربية تتكون من مصدر قدرة مباشر وأميتر وفولتميتر. و تم اخذ 50 قراءه للجهد والتيار، وعمل رسم بياني للجهد والتيار لعينة واحدة فقط لأي نوع من أشباه الموصلات. للثنائي المشع للضوء يزداد التيار فجأة عند 0.2 فولت، أما بالنسبة للثنائي العادي فان التغير يحدث عند 0.2 فولت، وللمقاومة الضوئية يحدث التغير عند 0.2 فولت أما بالنسبة للترانزستور يكون التغير الفجائي عند 0.4 فولت وهذا يدل على وجود فجوات طاقة. إن القيم المقابلة لفجوات الطاقة أقل من القيم المعتادة وهذا ينتج من وجود شوائب في العينة وتدل قيم الفجوات على ان الشوائب هي نحاس وحديد. عند تعريض العينات للحرارة تحدث زيادة في التيار وهذا يوافق حقيقة أن الحرارة تزيد من سرعة الإلكترون، وعند تعريض هذه العينات للمجال المغناطيسي تقل فجوة الطاقة التي تتوافق مع بعض البحوث.



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