

Dedication

This thesis is dedicated to my parents. This thesis is dedicated to those whom support and encouraged me throughout my graduate studies, my parents, brothers, .sisters and my friends

Acknowledgements

I would like to express my greatest appreciation and respect to Dr. Mohamed Hassan Eisa (M. H. Eisa), my M. Sc. adviser. I also wish to thank my colleagues and friends for making these past two years fun and enjoyable. My humble thanks are due to the whole staff, in particular, academic staff of the Department of Physics, University of Kordofan. Finally, I wish to thank my family for always supporting me. Immeasurable thanks go to my parents whom have been a great source of support throughout my .life

المخلص

في هذا البحث فحصت الخصائص الموصلية لشبه موصل جاليوم أرسنيد بواسطة برنامج المحاكاة MATLAB. أستخدم الحاسب الآلي للتحقق من الخصائص والمميزات الفيزيائية لمعاملات الموصلية لعينة جاليوم أرسنيد. لقد توصلت الدراسة علي تغير- الموصلية عند درجات حرارة مختلفة فوق الصفر المطلق. وكذلك تأثير تشويب العينة مع العناصر الأخرى علي الموصلية. والنتيجة التي تم الحصول عليها من هذه المحكاة هي أن الموصلية تزداد بزيادة درجة الحرارة وكذلك تقل مع زيادة نسبة الشوائب علي العينة. أيضا تم دراسة علاقة درجة الحرارة مع فجوة الطاقة وهي علاقة عكسية. تم التحقق من صحة نتائج المحاكاة بواسطة مقارنتها مع القيم التجريبية عند درجة حرارة الغرفة.

Abstract

The conductivity of GaAs semiconductor have examined and simulated by MATLAB code. The computer simulations are used to produces accurate physical characteristics of gallium arsenide from thermal information. The variation of conductivity at various temperatures and the effect of the doping concentration have studied. It is found that the conductivity jumped at above the absolute zero temperature, and largely proportional to various temperature. Also we have investigated that the energy gap it is proportional inversely with temperature. The relation of these results to experimental data in the .literature was discussed

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