SYNTHESIS & CHARACTERIZATION OF ZnS NANOPARTICLES AND STUDY OF MEMRISTOR AS ITS APPLICATION IN ELECTRONICS

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Submitted by

KRISHNA KUMAR KASHERWAL
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Under the Supervision of

Dr. V N Ojha Sc 'G'
Quantum Phenomena & Applications
NPL New Delhi

DEPARTMENT OF APPLIED PHYSICS

DELHI TECHNOLOGICAL UNIVERSITY

(Formerly Delhi College of Engineering)

Main Bawana Road, Shahabad Daulatpur, New Delhi – 110042

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NPL/VNO/KKK/DTU/11 02/07/11

CERTIFICATE

This is to certified that Mr**.** ***Krishna Kumar Kasherwal*** has carried out the project work presented in the thesis entitled ***"SYNTHESIS & CHARACTERIZATION OF ZnS NANOPARTICLES AND STUDY OF MEMRISTOR AS ITS APPLICATION IN ELECTRONICS"*** for the award of ***Master Of Technology*** in ***Nanoscience & Technology*** from **Delhi Technological University** under the Supervisions of **Dr. V N Ojha (Sc 'G') and Dr Rina Sharma (SC 'EII'); *Quantum Phenomena Application*, National Physical Laboratory, New Delhi**. The project has been carried out during the period from July 1, 2010 to July 1, 2011.

(Dr. V N Ojha) Dr. Rina Sharma

Supervisor Co- Supervisor

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ABSTRACT

The field of nanotechnology encompasses rapidly emerging technologies based upon the scaling down of existing technology to the next level of precision and miniaturization. Materials in the nanoscale may exhibit physical properties, distinctively different from the bulk. Decrease in size gives rise to an increase in the energy gap as well as splitting of the conduction and valance band into discrete energy levels becomes evident.

The II-IV compound semiconductors are of great importance due to their application in various electro-optic devices. This dissertation is based on the study of semiconducting ZnS nanoparticles. The ZnS nanoparticles are synthesized by chemical route embedded in PVOH matrix. ZnS having wide band gap 3.50-3.70eV is a promising material to be used in photovoltaic device, solar cells. The optical, structural and electrical properties of fabricated ZnS nanoparticles have been examined by various characterization techniques. The structure of the ZnS nanoparticles is confirmed by X-Ray analysis. Band gap is calculated from UV visible. The I-V curves are plotted for analyzing the switching property of the sample. The study concludes that ZnS nanoparticles are promising material for electro-optic, luminescent as well.

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