CERTIFICATE

This is to certify that the project report entitled **"Designing and Fabrication of Plasmonic Solar Cells by Incorporating Metal Nanoparticles"** which is being submitted by **Mr. Nishu Gupta (Enrollment No. 2K9/MT/FT/NST/11)** to **"Department of Applied Physics, Delhi Technological University, Delhi"** for the award of degree of **Master of Technology (NanoScience and Technology)** is a record of bonafide work carried out by him under our supervision.

The project work has been carried out from 7th February to 14th June 2011.

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STUDENT'S DECLARATION

I hereby certify that the work which is being presented in this project report entitled **"Designing and Fabrication of Plasmonic Solar Cells by Incorporating Metal Nanoparticles"** submitted to the Department of Applied Physics, Delhi Technological University in fulfillment of the requirement of the degree of **Master of Technology (NanoScience and Technology)** is an authentic record of my own work. I have not submitted the matter embodied in this dissertation for the award of any other degree elsewhere.

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ACKNOWLEDGEMENT

I take this opportunity to express my profound sense of sincere and deep gratitude to my guide **Dr. Suresh Chand, Scientist 'G', National Physical Laboratory** for providing me the golden opportunity of working under his aegis at Center for Organic Electronics, NPL and for giving me the necessary administrative support required for the completion of the project. I would like to give him my wholehearted thanks for allowing me to work in organic solar cell department.

I express my sincere gratitude to **Dr. Rajeev Chopra, Head of HRD Group, NPL,** for allowing me to carry out the project work in this prestigious research and development centre and gain valuable experience.

I would like to thank my research advisor **Dr. Vinay Gupta, Scientist 'C', NPL** for discussing the module of the project in a systematic manner. His constant interaction, expert guidance and valuable suggestions helped me to complete this project successfully.

I acknowledge the contribution of my faculty **Dr. Pawan Kumar Tyagi, Associate Professor, Department of Applied Physics, DTU** for assisting me in vivid ways.

Special thanks to **Dr. Shailesh Sharma**, **Dr. Pankaj Kumar, Dr. G.D.Sharma and Mr. Ramil Bharadwaj, Centre for Organic Electronics, NPL** whose co-operation and timely help proved very essential for carrying out the experiments.

I am highly thankful to **Mr. Neeraj Chaudhary, Centre for Organic Electronics Lab** for his valuable support, timely guidance and constructive criticism that motivated me to do valuable and sincere work.

Last but not the least; I would like to acknowledge the contribution of my friend **Mr. Jalaj Kumar Singh** without whom this project would not have been possible. I thank all the members and my lab mates of the organic solar cell division for their support and for giving me easy access to all the resources required for the successful completion of the project.

Finally, we would like to thank my parents and family members for their continuous encouragement and support.

Above all I am thankful to the 'Almighty' for showering his blessings upon me to complete my work successfully.

NISHU GUPTA

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ABSTRACT

This dissertation gives a comparison of photovoltaic performance of bulk hetrojunction solar cell using blends of poly (3-hexylthiophne) (P3HT) and [6,6]-phenyl-C61- butyric acid methyl ester (PCBM) with the ZnS doped P3HT and PCBM blends incorporating polyaniline nanotubes using common organic solvents and spin coating technique. ZnS nanoparticles were synthesized by aqueous method. Prior to these processes, fabrication and designing of solar cells, right from the initial steps such as patterning of ITO coated glass, etching, cleaning and subsequent processes were performed.

Characterization with AFM and SEM show particles are monodisperse and spherical in shape. The blue shift of optical adsorption edge indicates the formation of particles in nanometer regime.

The main advantages of such cells are easy preparation, low process temperature, low cost materials & processing technology and the possibility to produce flexible devices on plastic substrates. Such flexible cells are therefore candidates for gamut of applications, from handheld electronics to commercial power production.