

**STUDY OF PLASMONICS & PHOTOVOLTAIC EFFECT
ON POLYCRYSTALLINE CdTe THIN FILMS BY DOPING
WITH Ag NANOPARTICLES**



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Certificate

This is to certify that work in this thesis has been carried out by **Mr. Shan e Ahmad** and completed under my supervision in Thermal transport lab, school of chemical and materials engineering, National University of Sciences and Technology, H-12, Islamabad, Pakistan.

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DEDICATION

By grace of Allah we completed our final year project and also we would like to dedicate our work to community around us which is being helping us in completion of this research project. Our parents for their throughout support and to our teachers for their encouragement during this research. Even with the odds against us, we pull up together in finalizing our project and our research study for giving something back to society. With keen innovation and interest we're proud to contribute towards the developing society advancing in fields of sciences and engineering.

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ABSTRACT

Semiconductors play a crucial part in revolutionizing modern day industry in terms of efficiency, integrated circuits, intricate designs and environment friendly applications. In order to get familiar with working of this amazing technology we have to have some basic knowledge of all processes, scientific laws and conditions in case to avoid along process curies. Properties of materials varies in different conditions and they behave totally different as e.g. at nanoscale some certain factors and their influence cannot be ignored as we can do at bulk level. In this chapter we are covering all the aspects of research, basic terminologies and their introduction regarding our project.

In our project we are making CdTe thin films by using CSS (closed spaced sublimation) apparatus and then doped with different nanoparticles like Ag, Au, Cu etc. by taking into account the changes in film thickness and size and shape of nanoparticles and their effects regarding absorption, capacitance and efficiency for applications like solar cells. Many researches has been made in order to improve the efficiency of photovoltaic effect and study about plasmonic excitations. Our research is the succession of previous study as one step forward towards improvement and innovation. In this chapter we will give a brief explanation of all processes that we are going to perform in order to get the final shape of our product, to grasp all details. Brief introduction of thin films, their growth modes, apparatus used, doping, nanoparticle structure, morphologies etc. will be given.

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