PREFACE

Thin films of cadmium sulphide (CdS) are of considerable interest for their efficient use in the fabrication of heterojunction solar cells, photodetector, thin film transistor etc. Wide band gap CdS ($E_g \approx 2.45 \text{ eV}$) has been used as window material and buffer layer in heterojunction solar cells together with other narrow band gap materials such as cadmium telluride (CdTe) ($E_g \approx 1.45 \text{ eV}$) and copper indium selenide (CuInSe$_2$) ($E_g \approx 1.01 \text{ eV}$) as the absorber. The efficiency, sensitivity, performance cost and reliability of the device depends on the preparation technique and specific properties attained by such films. Different techniques like chemical bath deposition (CBD), Spray-pyrolysis, thermal evaporation, electron beam evaporation, r-f sputtering etc. can be used for growing CdS thin films. Among the various methods, chemical bath deposition (CBD) has been given much attention because it is a very simple and promising technique for the deposition of CdS thin films.

This thesis is a result of my investigation on chemically deposited CdS thin film regarding optimization of the growth condition, effect of etching and annealing and characterization of the films prepared at different specific conditions along with their use as sensitizer and window material in photochemical decomposition reaction.

The general introduction and importance of chemical bath deposition (CBD) techniques to prepare good quality CdS thin films have been discussed in Chapter-I of this thesis.
In Chapter II the detail of film preparation technique by CBD process at different bath condition and bath composition have been discussed.

The optical and optoelectronic properties of chemically deposited CdS thin films have been discussed in Chapter III.

Chapter IV describes the characterization of films by sophisticated instrumental techniques.

A qualitative analysis on photochemical decomposition reaction of certain organic compounds and textile dyes in presence of CdS thin films and CdS nanoscale particles have been discussed in chapter V.

In the sixth (VI) and last chapter general conclusions and discussions on scope for future works have been included.

Results quoted from the other authors for the purpose of review and critical analysis, have properly been referred to at the end of each Chapter. Necessary references have been included consecutively throughout the text of each Chapter.

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