

## Structural and Optical Properties of CdS Thin Films Deposited by R.F. Magnetron Sputtering

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CdS films were deposited on glass substrates by R.F. magnetron sputtering method and the films were annealed at various substrate temperatures ranging from room temperature to 300°C. Structural properties of the films were studied by X-ray diffraction analysis. The structural parameters as crystallite size have been evaluated. The crystallite sizes were found to increase, and the X-ray diffraction patterns were seen to sharpen by increasing substrate temperatures. X-ray diffraction patterns of these films indicated that they contain both cubic (zincblende) and hexagonal (wurtzite) structures as a mixture. Optical properties of the films were measured at room temperature by using UV/VIS spectrometer in the wavelength range of 190 to 1100nm and optical absorption coefficients were calculated using these data. The energy gap of the films was found to decrease, and the band edge sharpness of the optical absorption was seen to oscillate by annealing. The results show that heat treatments under optimal annealing condition can provide significant improvements in the properties of CdS thin films.

**Keywords:** CdS thin film, RF magnetron sputtering, Solar cell