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# Effect of the Zn Concentration on the Characteristic Parameters of $Zn_xCd_{1-x}S$ Thin Films Developed by Spraying Pyrolysis Method Under the Nitrogen Atmosphere

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**Abstract:** The electronic and optical properties of $Zn_xCd_{(1-x)}S$ thin films (0.0 \le x \le 0.7) fabricated using the chemical spray method have been investigated in nitrogen atmosphere. The films are deposited on glass substrates at 420$^o$C substrate temperature. The related optical data are recorded in the wavelength range 200-700 nm. In addition, the absorption coefficient is determined and correlated with the photon energy in order to estimate the direct transition energy bandgap. The crystallite size and degree of preferential orientation were found to decrease with the increase of x and to improve upon annealing in vacuum at \cong 600$^o$C. The transmission edge shifted towards shorter wavelengths with increase of x in agreement with the expected shift in energy band gap. The films were found to exhibit room temperature resistivity variation in the range 100-1000 Ω cm with composition.

**Key Words:** Spray Pyrolysis, Thin Film, ZnCdS

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