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GROWTH AND OPTICO-MICROSTRUCTURAL PROPERTIES OF PBS THIN FILMS PREPARED BY CHEMICAL BATH DEPOSITION METHOD

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ABSTRACT

Thin films of lead sulphide have been grown by chemical bath deposition method, using triethanolamine as complexing agent. The films were deposited on both surfaces of the glass substrate at deposition time of 4hours. One sample was kept unannealed while one was annealed at temperature of 150°C for 1 hour in an electric oven. Visible/Ultraviolet spectrophotometer, model 6405 was utilized to measure the transmittance and reflectance of each sample at various wavelengths. Also, the samples were studied with the use of optical microscope and Scanning Electron Microscope. The effect of annealing on transmittance and reflectance of chemically deposited lead sulphide thin film were then studied. It was observed that higher values of transmittance and lower values of reflectance were obtained from annealed sample when compared with the unannealed sample.The average grain size in the unannealed film was estimated to be 1.3µm while that of the annealed film was estimated to be 2.5µm. such increase is attributed to the grain growth during annealing. The high values of transmittance and low values of reflectance are also attributed to the absence of precipitate on PbS after annealing. Hence the study reveals that annealing has effect on grain size, transmittance and reflectance of the films.

KEYWORDS: Microstructural, Chemical Bath