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Spectroscopical Study of Amorphous AsSe : Sn Films

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Abstract

The effect of tin impurities on optical spectra of thermally deposited AsSe films doped with Sn (1 to 10 at %) was studied in a wide energy interval from 0.8 to 6.2 eV by combination of reflection, absorption, photoresponse and photocapacitance spectroscopies. Most changes have been detected at the fundamental absorption edge over which a correlation between the band tail width and optical gap is demonstrated for various tin concentrations. The tin induced absorption band associated with a localized energy level at about 1.6 eV in the gap was revealed. Distinct variations in the reflectivity spectra of the fundamental absorption region suggest a tin assistance in the formation of the valence band states of the material.