Optical Properties of Cellulose Derivatives Blend Film Carrying a Chalcogenide Material

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Abstract:

Polymeric films composed of mixture of ethyl cellulose (EC) and hydroxypropyl cellulose (HPC) are prepared from casting combined solvent (methylene chloride and methanol in 1:1 ratio) containing 8% weight/volume of both polymers (EC to HPC in 1:3 weight ratio). The structural and optical studies of the films are carried out by X-ray diffraction and UV–vis spectrophotometer. The films are polycrystalline structure with an average grain size from 23.15 to 10.79 nm. The possible optical transition in these films is found to be allowed direct transition. The optical band gap energy (Eg) is estimated to be 5.02 eV for HPC–EC plain film and then decreases with increasing the filler content reaching to 4.24 eV for the film filled with maximum Se80Te14Sn6 content of 1 w%. This suggests that Se80Te14Sn6, as filler, is a good choice to control the optical properties of HPC–EC blend film.

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