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Studies of Iron Diselenide Thin Films Deposited by Thermal Evaporation

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Abstract : Iron diselenide (FeSe) composite thin films have been formed onto ultrasonically and chemical cleaned glass substrates by thermal evaporation technique from powder. This latter was prepared by mechanical alloying. The structural evolution of a binary alloy with nominal composition FeSe2 prepared by ball milling was investigated as a function of milling time. The structural properties of the powders and the films were ascertained by x-ray diffraction method. The XRD patterns showed that for milling times up to 1 h, the FeSe phase is formed. The band gap E estimated from optical absorption data was between 0.8–1.01 eV, depending on preparation conditions such as substrate temperature. High optical absorption coefficients (> 104 cm? 1g) were found.

Keywords : FeSe, Solar energy materials, Mechanical Alloying, Thermal evaporation, Thin films