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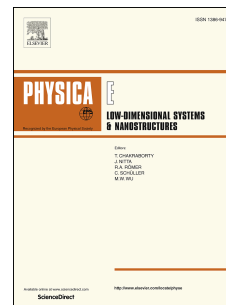
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Dielectric dispersion in InSe/CdS bilayers

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In the current study, the effect of the amorphous InSe thin film substrate on the structural, optical and dielectric properties of CdS are investigated. The structural analysis of the bilayers indicated a strained growth of CdS onto InSe leading to decrease in grain size and increase in the dislocation density. The optical measurements have shown that the InSe/CdS exhibits two direct allowed transitions energy band gap values of 2.04 and 1.38 eV, in the high and low absorption regions, respectively. On the other hand, the detailed analysis of the dielectric spectra for the InSe, CdS and InSe/CdS layers has shown that the presence of the InSe substrate significantly improves the optical conduction parameters. Particularly, the Drude-Lorentz modeling for these dielectric systems revealed a drift mobility value of 329 cm²/Vs for the InSe/CdS bilayer. The deposition of the CdS onto InSe is also observed to shift the plasmon frequency of CdS from 2.49 to 0.77 GHz. The general features of the InSe/CdS as plasmon cavities are promising as it shows its usability for production of optoelectronic devices that exhibit high performance at very high frequencies.

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Keywords: InSe/CdS; Optical materials; Coating; Dielectric properties; Drude- Lorentz

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