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High Orientation CdS Thin Films Grown by Pulsed Laser and Thermal Evaporation

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Abstract

Undoped CdS films have been grown by pulsed laser evaporation (PLE) and thermal evaporation (TE) techniques on Corning's 7059 glass at a substrate temperature between room temperature and 250□°C. The deposition rates are 0.07 Å/s for PLE and 60 Å/s for the TE technique. These as−deposited films have high (002) preferred orientation by both techniques even without preheating the substrate. However, films deposited by PLE have more preferred orientation and larger grain size. These features make the PLE films have sharper Raman peaks, smaller Raman shift of surface mode and more overtones of longitudinal optical phonon mode observed than those in TE films. The transparency of PLE or TE films for wavelengths which are larger than that of absorption edge is around 90% on average.