Rare earth (Eu, Ce)-doped CdS nanofilms are prepared using the growth technique chemical bath deposition (CBD) under optimum conditions lead acetate at the reservoir temperature of 70 ± 2°C. The synthesis time was varied from 80 to 130 min, in order to observe its effect on the passivation by rare earths of the CdS nanoparticles. The rare earth molar concentrations were in the ranges 0.0 ≤ x ≤ 0.20, which were determined by energy dispersive X-ray spectroscopy (EDS). The X-ray diffraction (XRD) analysis and Raman scattering reveal that as-deposited CdS films showed the zincblende (ZB) crystalline phase. The average nanocrystal size ranged from 1.21 to 1.77 nm for the CdS films and 0.94-1.43 nm for rare earth-doped CdS nanofilms that were determined by the Debye–Scherrer equation from ZB (111) direction, and it was confirmed by high-resolution transmission electron microscopy (HRTEM). Raman scattering shows that the lattice dynamics is characteristic of bimodal behaviour and the multipeaks adjust of the first optical longitudinal mode for the (Eu, Ce)-doped CdS denotes the Raman shift of the characteristic peak about 305 cm\(^{-1}\) of the CdS crystals. The films exhibit two direct bandgaps at 3.80 and 2.56 eV, obtained by transmittance an attributed to quantum confinement and another attributed to CdS, which do not change with the increase of the reaction time which means increase of the rare earth molar fraction.. The room temperature photoluminescence presents a dominant band at about 3.00 eV, which is associated to quantum confinement due to grain size is lower than to the exciton Bohr radius of CdS (2.8 nm) and other radiative peaks associated at structural defects.

**Keywords:** cadmium sulphide, chemical bath deposition, rare earth

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