nanomaterials

Supplementary Materials

Tailoring the Emission Behavior of WO_3 Thin Films by Eu^{3+} Ions for Light-Emitting Applications

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Supporting Information

$$D_{hkl} = \frac{k\lambda}{\beta_{hkl}\cos\theta_{hkl}} \qquad \text{Equation (S1)}$$

where k is a constant and its value is 0.9 for spherical shape particles. λ=1.5406 Å, is the wavelength of the X-ray radiation (CuKα line) used for recording the diffractograms. β_{hkl} stands for the full width at half maximum intensity (FWHM) of the intense (200) peak and θ_{hkl} denote half of the diffraction angle corresponds to intense (200) peak.

$$T\tan\theta_{hkl} = \frac{\lambda}{D_{hkl}\cos\theta_{hkl}} - \beta_{hkl} \qquad \text{Equation (S2)}$$

where T denotes the strain in the films.

$$\delta = \frac{1}{D^2} \qquad \text{-Equation (S3)}$$

where δ denotes the dislocation density.

$$\alpha(h\nu) = A(h\nu - E_g)^n \qquad \text{Equation (S4)}$$

where 'A' is a constant called the band edge constant and is associated with the band tailing. hν corresponds to the energy of the incident photon and 'n' determines the nature of electronic transition.