Optical analysis using effective medium theory and finite element method to study the enhanced light absorption in porous BaMgAl$_{10}$O$_{17}$ : Eu$^{2+}$ phosphor

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The main objective of this paper is to reveal the mechanism of enhanced excitation light absorption in nano-pores structure BaMgAl$_{10}$O$_{17}$ : Eu$^{2+}$ (BAM) phosphor by optical analysis. The optical refractive index of the BAM was calculated from the reflectance spectra by Kramers-Kronig dispersion relation. And based on the effective medium theory, the anisotropic optical properties of porous BAM layer and its relations of absorption enhancement with porosity and thickness were investigated. A finite element simulation model was used for study the influence of pores size on optical properties. All the numerically evaluated results were match the experimental data.

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