Journal of Basic and Applied Engineering Research
p-ISSN: 2350-0077; e-ISSN: 2350-0255; Volume 3, Issue 13; October-December, 2016, pp. 1216-1216

http://www.krishisanskriti.org/Publication.html

Luminescence Properties of Ln^{3+} Doped (Ln= Sm, Dy) Nanocrystalline Scheelite $BaMoO_4$

Ch. Victory Devi

Department of Chemistry, PUC, Mizoram University, Aizawl-796001, Mizoram
E-mail: victorychanambam@gmail.com

Abstract—*Ln^{3+} doped $BaMoO_4$ (Ln= Sm and Dy) nanoparticles have been synthesized through co-precipitation method using ethylene glycol as a capping agent. All the prepared samples are characterized by XRD, FT-IR, SEM and photoluminescence study. XRD result revealed the pure tetragonal scheelite-type structure of $BaMoO_4$ thereby indicating charge difference induced by trivalent ions (Ln^{3+}) doped in to the site of bivalent host ions (Ba^{2+}) did not affect the pure tetragonal structure of $BaMoO_4$. The SEM image of the as-prepared $BaMoO_4$ samples consists of a number of uniform shuttle-like nanocrystalline with protrusion in the middle. The introduction of Ln^{3+} ions does not affect the morphology of the $BaMoO_4$. The photoluminescence study has been carried by measuring the excitation and emission spectra. The excitation spectrum consists of a broad band with a maximum at about 268 nm thereby demonstrating the energy transfer occurs from MoO^{2-}_4 groups to the Ln^{3+} ions. The emission spectra are dominated by the transition of Ln^{3+}, which is an electric- dipole allowed transition and hypersensitive to the environment and the highest luminescence intensity is observed at 20 at.% Ln^{3+} under the ultraviolet excitation. Under this ultraviolet excitation $BaMoO_4:Sm^{3+}$ exhibits strong orange-red and $BaMoO_4:Dy^{3+}$ greenish-yellow emission which could serve promising materials in field of display devices.*

Keywords*: tetragonal scheelite structure, nanocrystalline, orange-red emitting phosphor*