A STUDY ON FACILE SYNTHESIS OF YB^{3+}, ER^{3+}, EU^{3+}-CODOPED YVO_4 NANOMATERIAL AND ITS APPLICATION

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Abstract: In this work, a simple method for the synthesis of Yb^{3+}, Er^{3+}, Eu^{3+} coped- YVO_4upconversionnanoparticles using polymer as a template is proposed. The obtained particles possess nanoscaleuniform, and flexible excitation. The structure and optical properties of prepared material have been carefully studied. Effect of Eu^{3+} ions on the luminescence properties of YVO_4:Yb^{3+},Er^{3+},Eu^{3+} was performed. The upconversion mechanism of prepared material was discussed.The results were characterized by X-ray diffraction (XRD), Fourier-transform IR spectroscopy (FTIR), scanning electron microscopy (SEM), Transmission electron microscopy (TEM) upconversion and photoluminescence spectra.The Commission International de I'Eclairage (CIE) chromaticity coordinates was investigated to confirm the performance of color luminescent emission. The prepared YVO_4:Yb^{3+},Er^{3+},Eu^{3+} nanoparticles could be easily dispersed in water due to surface modification with cysteine (Cys) and glutathione (GSH). Importantly, the aqueous dispersion of modified YVO_4:Yb^{3+},Er^{3+},Eu^{3+} exhibited bright upconversion and downconversion luminescence and it could be used for imaging HeLa cells.

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