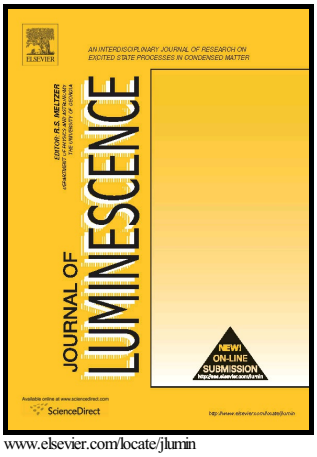

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Abstract

Re-dispersible with different color emitting capable YVO_4 nanocrystals have been synthesized using facile chemical route. The nanocrystals are tunable in size by varying pH of the reaction medium. The tunability of size is confirmed from UV-visible absorption and transmission electron microscopy. This is further unambiguously established from the luminescence studies where the intensity of luminescence reduces with the decrease in particle size. This reduction is related to the presence of more surface defects and dangling bonds in smaller nanocrystals leading to substantial quenching. Steady state luminescence and its decay dynamics studies support the surface phenomenon in the luminescence quenching. These nanocrystals are readily re-dispersible in polar solvents, which can be fabricated in polymer-based films for different display applications. Further, re-dispersible $YVO_4:Eu^{3+}$ shows the selective detection of Cu^{2+} ions through resonance energy transfer with a limit of detection ~ 0.15 μM.