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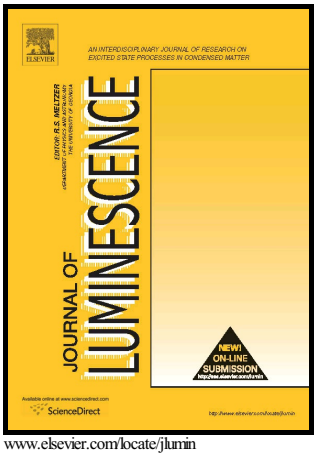

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Luminescent ZnSe:Mn/ZnS@PMMA nanocomposites with improved refractive index and transparency

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Abstract

This paper deals with development of a novel ZnSe:Mn/ZnS@PMMA nanocomposites fabricated via simple film casting methods using commercial available PMMA resin (DEGALAN® Evonik). Hydrophobic ZnSe:Mn/ZnS nanoparticles were successfully produced by the hot-injection method using high boiling point organic solvents. ZnSe:Mn colloidal nanoparticles were protected from luminescence quenching and degradation by overcoating with a ZnS shell. The coverage of the nanoparticles with three layers of the ZnS shell effectively protected them against photooxidation and quenching in organic solvents. The crucial step in the production of highly transparent and luminescent ZnSe:Mn/ZnS@PMMA polymer nanocomposites was the purification of the ZnSe:Mn/ZnS nanoparticles from by-products and unreacted precursors. The optical properties of