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Study

Förster resonance energy transfer and excited state life time reduction of rhodamine 6G with NiO nanorods in PVP films

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Abstract

In the present study, we report the preparation of NiO nanorods (NNR) and its Förster resonant energy transfer (FRET) behaviour with Rhodamine 6G (R6G) in a Polyvinyl pyrrolidone (PVP) polymer matrix. The prepared nanocomposite polymer (NCP) films contain PVP and R6G whose concentrations are kept constant and different concentrations of NNR. Spectral overlap between the absorption and fluorescence spectrum of R6G and NNR show the possibility of FRET phenomena to be occurring in the prepared NCP films. Steady state and time resolved fluorescence measurements are carried out at two excitation wavelengths (330 and 510 nm) to study the energy transfer process between R6G and NNR in the PVP host. The obtained results show that the energy transfer is from R6G (serves as a donor) to NNR (functions as an acceptor). Calculated radiative efficiencies, donor – acceptor distances and average lifetime also confirm the energy transfer from R6G to NNR.

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