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Optical and morphological characterization of novel Coumarin 151 doped polyvinylpyrrolidone thin film

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Abstract

Novel dye-doped polymer thin films were obtained by spin-coating method using polyvinylpyrrolidone (PVP) as polymer and Coumarin 151 (C151) as dye. The optical and morphological properties of the obtained dye-doped polymer thin films were investigated by UV-vis absorption, steady-state fluorescence and scanning electron microscopy (SEM) measurements. In addition, the effect of pH on the optical and morphological properties of these new thin films was determined. It was observed that while thin films exhibited high fluorescence properties in acidic medium (pH 2, 4, 6), fluorescence properties of their decreased depending on the pH increased (pH 9, 10, 12). It was determined with SEM images that the surface morphology of thin films changed from rectangular to spherical depending on the pH. It is hoped that these new dye-doped polymer thin film will significantly contribute to optoelectronic devices with the obtained results.

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