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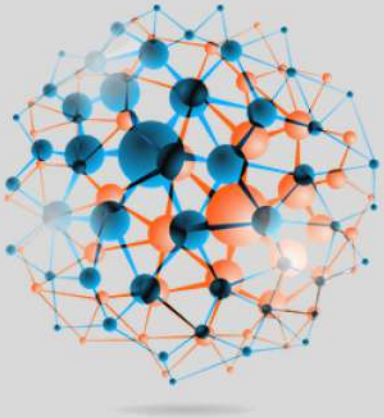
BOOK OF ABSTRACTS



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Transparent Multi-Color Emitting Carbon Dot/Polymer Films and Applications Thereof

Wednesday, 24th March - 11:50: Oral Session 1-2 (Room 2) - Abstract ID: 128

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Carbon nanodots (CDs) are new hemispherical carbon-based nanoparticles with particle sizes smaller than 10 nm, which have attracted great attention due to their attractive photophysical properties, easy functionalization, cheap and easy preparation, low toxicity, and biocompatibility[1]. CDs with high photoluminescence quantum efficiency have been promising materials for fluorescent materials in applications such as biomedical, sensing, light-emission diode (LED), energy storage and conversion, and optoelectronic devices[2–6]. Recently, polymer/quantum dot nanocomposites have received great attention to obtaining solid films of high transparency and high fluorescence for integration in various application areas. The polymer matrix provides mechanical and chemical stability and helps quantum dots to disperse and maintain their fluorescence. In the present study, multi-color emitting CDs were synthesized according to our previously reported method[7]. CDs were synthesized from various carbon sources (molasses, lemon salt, etc.) using a one-step thermal and microwave synthesis method. Fluorescent and transparent CD / Polyvinyl alcohol (PVA) films are prepared using the solvent-casting method by *in situ* embedding CDs into the PVA polymer matrix. Optical (UV-Vis, fluorescence emission), surface morphology (SEM), and chemical (FTIR, TGA) properties and biological activities (anti-microbial, biofilm inhibition) of these films were investigated. Thus, the composite materials obtained could later be used for designing smart polymeric materials for their use in the development of advanced optical devices, skincare materials, and food protection layers.

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