

Green synthesis and biological applications of doped carbon dots

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Abstract

Microwave (MW)-assisted pyrolysis has emerged as the most-feasible green synthetic approach for the synthesis of carbon dots due to its efficient energy consumption, sustainability, lower temperature and shorter reaction time along with higher product yield. Carbon based nanomaterials are known for their fascinating optical and electrical properties and their potential applications in energy conversion and storage. Doping of carbon dots is the major renowned pathway to control the properties of nanoscale carbonaceous materials. Doping causes a significant change in electronic structure of the carbon dot materials and which eventually leads to a change in the optical and electrical properties and makes them suitable for potential devices. Owing to their structural diversity, carbon nanodots exhibit varied and tunable photoluminescence such as up-conversion, photoluminescence, phosphorescence, solid state fluorescence, and piezo-chromic fluorescence. These incredible properties of CDs make them applicable to live cell imaging, biology, materials, catalysis, optics and sensors

Here we report a facile and effective one pot synthetic strategy to prepare nitrogen, sulphur and first row transition metals doped carbon dots by microwave assisted green synthesis, characterization of these doped carbon dots and their diverse applications focusing especially in the biological field.

Biography

Dr. Sobhi Daniel has completed her PhD from National Institute for Interdisciplinary Science and Technology (NIIST), CSIR, Thiruvananthapuram, Kerala, India in 2007. She has completed her Post doctoral work from the Technical university of Dortmund, Germany as an Alexander Humboldt fellow in 2009. She has contributed more than 25 international publications, patent and book chapter. She has coordinated various international and national conferences and associated as a guest editor for materials science today conference proceedings. For last 10 years she is serving as an assistant professor of Chemistry in the government colleges of Kerala. The key research areas of interest include green synthesis of metal nanoparticles, carbon dots, colorimetric and fluorimetric sensors for toxic heavy metal ions, dioxins and pesticides, imprinted polymers for various applications such as separation/ sensing, drug delivery etc. During the past 5 years she has been actively engaged in research activities, guided 10 Msc project students and 12 BSc students.



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