

SYNTHESIS AND CHARACTERIZATION OF PHOTOPHYSICAL STUDIES OF BIOCHAR BASED CARBON DOTS AND FUNCTIONAL MATERIALS

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Abstract: Biochar is an environmentally-friendly product formed by the thermal decomposition of biomass. Biochar is rich in carbon moieties and is porous, allowing ease of modification and high surface areas. Such properties make it applicable in many fields, including bio-imaging and bio-sensing. Because of its easily tuned surface functionality and porosity, biochar is recognized as a promising platform material for the synthesis of a broad range of functional materials. This research involved the use of manure biochar to produce blue fluorescent carbon dots via physiochemical treatment. The synthesized carbon dots were used to functionalize polyethyleneimine (PEI)-coated magnetic nanoparticles via a seed-mediated growth method. Because of low toxicity, biocompatibility and high photo-stability, the biochar carbon dots functionalized PEI-coated magnetic nanoparticles can be used for selective detection, separation, identification and imaging of cancer cells from whole blood in living body.

Key Words: Biochar, Carbon Dots, Magnetic Nanoparticles, Bio-Sensing

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