Synthesis and Characterization of Carbon quantum dots/ZnO nanoparticle composites by an Electrospinning-hydrothermal process

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Currently environmental pollution has become an extremely urgent problem. Carbon quantum is good for these problem because it is environmentally friendly and low toxicity. Also ZnO has high catalytic activity as a semiconductor photocatalyst. In the present work, Carbon quantum dots CQD/ZnO nanoparticle composite were prepared by using simple technical route through which ZnO nanoparticle were prepared by electrospinning and hydrothermal synthesis and dispersed in CQDs solution, then dried. The CQD/ZnO nanoparticle structure and optical properties characterizations were performed by X-ray photoelectron spectroscopy, scanning and transmission electron microscopy, UV-visible absorption, photoluminescence. The visible light photocatalytic activity of CQDs/ZnO nanoparticle composite was investigated by degradation, and it is demonstrated that the photocatalytic performance of this composite was signification enhanced compared with that of pure ZnO nanoparticle.