

One-step preparation of P-doped graphene quantum dots decorated on TiO<sub>2</sub> nanosheets for enhanced visible light photocatalyst degradation

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In this research, phosphorous doped graphene quantum dots (P-GQDs) was synthesized and studied the water-treatment photocatalytic performance. Simple and eco-friendly P-GQDs was prepared by a hydrothermal method in presence of dextrose as carbon source and phosphoric acid as doping agent. The morphology, chemical analysis, optical properties were investigated using Scanning Electron Microscope (SEM), Transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FT-IR), UV-vis absorption spectroscopy, Fluorescence spectroscopy, and Brunauer-Emmett-Teller (BET) surface area measurements. The P-GQDs showed tunable band gap at different amounts of phosphoric acid that can be obtained from 2.13 eV to 3.83 eV. Furthermore, Porous TiO<sub>2</sub> nanosheets were combined with P-GQDs for enhanced visible photocatalytic activity of degradation toward Methylene Blue (MB) and Norfloxacin. These performances are resulted from photo-induced charge separation between P-GQDs and porous TiO<sub>2</sub>