Photocatalytic Degradation and Adsorptive Removal of Tetracycline on Magnetic Amine-Functionalized Graphene Oxide/ZnO nanocomposites

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Semiconducting nanomaterials are recently used in the photocatalytic removal of aqueous pollutants like xenobiotics, organic compounds, and heavy metals. Zinc oxide (ZnO) nanoparticle has attracted considerable spotlight for degrading these kinds of substances due to its low cost, abundance, high quantum efficiency, favorable bandgap, and its photocatalytic mechanisms. Tetracycline (TC), a broad-spectrum antibiotic, is commonly found in water due to its widespread use. We report a new material of melamine-functionalized $GO/ZnO/Fe_3O_4$ for removal TC. The catalytic nanocomposites were synthesized by in-situ sol-gel method. The catalyst properties have been investigated in detail. The photocatalytic performance under UV light was measured by HPLC, LC-MS analysis. The catalyst presents significant adsorption and photocatalytic activity, a TC removal efficiency reach over 99% after 165 mins. The highest value of TC removal efficiency of 100% was registered after 135 mins by adding $K_2S_2O_8$ as an electron scavenger