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Synergy of N-doped TiO_2 and visible LED irradiation in peroxymonosulfate activation: Application to monuron decay and reaction kinetics

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The combination of N-doped TiO_2 photocatalyst (NT) and visible LED irradiation (Vis LED) was explored for monuron degradation *via* Peroxymonosulfate (PMS) activation. It was found that the generated •OH and $SO_4^{-\bullet}$ have a significant role in the monuron degradation with a ratio of about 3 to 1, respectively; and the holes at the NT surface are the main precursors for producing $SO_4^{-\bullet}$. The monuron was efficiently degraded under a wide solution pH range of 2.5-9.2, where higher than 80% decay was achieved. Furthermore, the efficiency of the NT/PMS/Vis LED process was not reduced in the presence of high concentrations of inorganic anions in the solution, which renders this process attractive for the treatment of anions rich wastewater in the cities (like Hong Kong). Considering several factors such as the use of non-metal dopant and energy efficient Vis LED light source, this process could be deployed as a sustainable and environmentally friendly approach for degradation of organic pollutants in wastewater through PMS activation.

Biography

Amal has been working at Ministry of State of Environmental Affairs, Egypt. Her responsibilities have included assessment of water and wastewater quality and management of solid and hazardous wastes. She is also about to complete her Ph.D. degree from Civil and Environmental Engineering department, The Hong Kong Polytechnic University, Hong Kong.

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