

Radical and single oxygen induced degradation of caffeine with Fe⁰-D-glucose carbon as heterogeneous activator for peroxymonosulfate

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Caffeine (1,3,7-trimethylxanthine), a psychoactive stimulant compound, has emerged as a contaminant due its endocrine disruption effect in some fish species. The high solubility and non-volatile nature of caffeine in water makes it persist in the hydrosphere. Advanced oxidation process has emerged as an efficient way to activate peroxymonosulfate (PMS) to degrade organic contaminates such as caffeine. In this study, a Fe⁰-D-glucose carbon composite is synthesized under hydrothermal condition followed by carbothermic reaction under N₂ and used as catalyst to activate PMS to degrade caffeine. The Fe⁰-D-glucose carbon is duly characterized by FE-SEM, EDX, XRD and TGA. Our results show that Fe⁰-D-glucose exhibits outstanding caffeine degradation capability.