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Ultrasound-assisted heterogeneous activation of persulfate by nano zero-valent iron (nZVI) for the propranolol degradation in water

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Abstract

This study investigated the degradation of propranolol (PRO), a beta (β)-blockers, by nano zero-valent iron (nZVI) activated persulfate (PS) under ultrasonic irradiation. Effects of several critical factors were evaluated, inclusive of PS concentration, nZVI dosage, ultrasound power, initial pH, common anions, and chelating agent on PRO degradation kinetics. Higher PS concentration, nZVI dosage and ultrasound power as well as acidic pH favored the PRO degradation. Conversely, anions and chelating agent took on the inhibitory effect towards PRO degradation to different extents. Furthermore, the variations of morphology and surface composition of nZVI before and after the reaction were characterized by TEM, XRD and XPS. Finally, on the basis of identified degradation intermediates by LC/MS/MS analysis, this work

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