Using potassium ferrate as advanced treatment for municipal wastewater

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ABSTRACT

Potassium ferrate is a potential high efficient chemical for wastewater treatment as a combination of oxidant and flocculent. In this research, potassium ferrate was used to treat simulated wastewater and secondary effluent of a wastewater treatment and the removal performance was evaluated base on the treatment of chemical oxygen demand (COD), total organic carbon (TOC), suspended solid (SS) and total phosphorous (TP). The results present that the organic matters (indexed by COD and TOC) could be effectively eliminated during both the oxidation stage and flocculation stage while SS and TP were majorly got rid of during flocculation stage. The effects of pH, reaction time and potassium ferrate dosing were also investigated and the optimum conditions were found as: The potassium ferrate concentration of 40 mg/L, oxidation time of 20 min (pH of 10.31), and flocculation time of 30 min (pH of 3.28) except TP and SS removals; For secondary effluent, potassium ferrate of 40–50 mg/L, 25 min of oxidation, and 20 min of flocculation.

Keywords: Potassium ferrate; Municipal wastewater; Advanced treatment

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