



Electrochemical-based advanced oxidation for hospital wastewater treatment

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ABSTRACT

Healthcare facility wastewater considerably increases the levels of micropollutants in municipal wastewater. Considering this, the presence of contaminants of emerging concern in the environment has been highlighted as a global environmental problem. Electrochemical advanced oxidation (EAO) generate strong oxidants such as HO[•], H₂O₂, and O₃⁻ which can remove organic pollutants in water including pharmaceutical. This review presents the latest research findings concerning the mechanisms, influencing factors, and innovative approaches for treating wastewater generated by healthcare institutions. Electrochemical oxidation has proven a promising wastewater treatment technology, especially, for pharmaceutical-contaminated wastewater. EAO is widely regarded as a pioneering technique in the field of wastewater treatment because of its strong performance in the mineralization treatment for pharmaceuticals as well as the detoxification treatment of extremely biologically harmful organics. The use of EAO technology is of utmost importance in augmenting the efficiency of electrochemical systems in the decomposition of organic substances. Furthermore, it lays the groundwork for implementing these systems to treat wastewater derived from medical facilities and hospitals. Nevertheless, it is noteworthy that most experimental studies have focused on single-component wastewater that has been artificially prepared in laboratory settings. Wastewater from healthcare institutions often exhibits a complex and diverse composition, influenced by various factors.

Keywords: Electrochemical oxidation; Hospital wastewater; Pharmaceuticals; Electrode material

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