



Combined catalytic ozonation and electroflocculation process for the removal of basic yellow 28 in wastewater

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ABSTRACT

The study aims to investigate the decolourization of basic yellow 28 by catalytic ozonation and electroflocculation using iron loaded rice husk ash (Fe-RHA) as catalyst. The comparative study of various advanced oxidation processes such as ozonation, catalytic ozonation, electro flocculation and combined process was conducted. In addition, the kinetic considerations were applied and rate constants of various processes were compared. Finally, chemical oxygen demand (COD) and decolourization efficiencies were studied. The comparison among the advanced oxidation processes at pH 7 shows that the maximum removal of 75.8% was achieved by synergetic process (electroflocculation and catalytic ozonation using Fe-RHA catalyst). Increase in catalyst dose showed enhancement in decolourization by the synergetic process, maximum decolourization of 87.3% was achieved in 120 min with 60 g Fe-RHA. The COD removal was found to be significant (52% in 120 min) in combined process. The pseudo-first-order kinetic model was applied to the processes, rate constant of synergetic process was found to be the highest that was $11.2 \times 10^{-3} \text{ min}^{-1}$. Therefore, it is concluded that catalytic ozonation in combination with electroflocculation process was an effective method for the decolourization of basic yellow 28 near wastewater pH.

Keywords: Catalytic ozonation; Electroflocculation; Basic yellow 28; Rice husk ash

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