Research on Fe-loaded ZSM-5 molecular sieve catalyst in high-concentration aniline wastewater treatment

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\textbf{ABSTRACT}

Fe-ZSM-5 molecular sieve catalysts were fabricated and characterized through scanning electron microscopy, energy dispersive spectroscopy, and X-ray diffraction techniques. Researches were developed within a heterogeneous Fenton-like catalysis system established with Fe-ZSM-5 molecular sieve catalyst and H\textsubscript{2}O\textsubscript{2}, with regard to the effects of pH, H\textsubscript{2}O\textsubscript{2} dosage, inlet concentration of aniline, and catalyst dosage on extent of removal and reaction rate, and preliminarily revealed the mechanisms of degradation in aniline wastewater. Outcomes have demonstrated that Fenton-like Fe-ZSM-5 molecular sieve catalysts are functionally stable and recyclable in which the extents of removal of aniline, COD\textsubscript{Cr} and TOC are 96.4, 92.5, and 72.5\%, respectively; with 3 g catalyst dosed into 500 mL aniline wastewater of 200 mg L\textsuperscript{-1} in concentration, pH 4, and H\textsubscript{2}O\textsubscript{2} of 0.5Q\textsubscript{th} (0.31 mL L\textsuperscript{-1}), the Fenton-like conditions could not only break up the inner structures of aniline, but also catalyze the products in further mineralization to CO\textsubscript{2} and H\textsubscript{2}O.

\textbf{Keywords:} Fe-ZSM-5 molecular sieve; Aniline wastewater; Fenton-like; Degradation