



Comparison of catalytic effect of Fe-MOF and Fe-ZIF for Fenton degradation of Eriochrome black T

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ABSTRACT

Fe-MOF and Fe-ZIF as heterogenic catalysts were prepared and characterized by FTIR, X-ray diffraction and scanning electron microscopy methods. The decolorization of Eriochrome black T (EBT) by Fenton oxidation was investigated. The effects of different parameters such as contact time, amount of catalyst, pH of solution, the initial concentrations of Fe²⁺, H₂O₂ and EBT dye on the oxidation were investigated and optimized conditions were determined. The 95% degradation of EBT was obtained after 15 min of reaction at pH 3 for EBT 60 mg L⁻¹ and 0.04 g catalyst. Results showed that efficiency of EBT removal is as followed: Fe²⁺/H₂O₂ < Fe²⁺/H₂O₂/Fe-MOF < Fe²⁺/H₂O₂/Fe-ZIF. Results of TOC removal showed the partial and insignificant mineralization of EBT (85%). The results of experiments showed that degradation of EBT dye described with a pseudo-second-order kinetic model. The catalysts could be easily recovered and showed high potential for applications in wastewater treatment without secondary pollution. In conclusion, heterogen catalysts of Fe-MOF and Fe-ZIF for Fenton oxidation method as promising technique can provide appropriate conditions for the treatment of dye for the reuse of effluents.

Keywords: Catalyst; Eriochrome black T; Fenton; MOF; Oxidation; ZIF

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