عنوان مقاله:

Application of a Moving Bed Biofilm Reactor in Removal of Ciprofloxacin From Real Hospital Effluent: Effect of Operational Conditions

محل انتشار:

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خلاصه مقاله:

The presence of pharmaceutical wastewater containing antibiotic compound is one of the new problems relating to the environmental pollution. Antibiotic ciprofloxacin (CIP), widely used in medical treatments, can induce antibiotic resistance in low concentrations in the ecosystem and aqueous solutions. In this study, CIP was removed using moving bed biofilm reactor (MBBR) from real hospital-derived wastewater. This study was carried out at Beasat hospital in Hamadan, Iran. CIP (۱۰۰ mL) was applied in ۲ sets of plexiglass tubular columns as MBBR. Microorganisms were grown on the suspended carriers. To achieve this purpose, polyethylene kaldnes (K۱) was chosen as reactor bed in ۵۰۰ m۲ /m۳ specific area. The effect of operating parameters such as mixed liquor suspended solid (MLSS) (۱۰۰, ۱۰۰۰, ۳۰۰۰ mg/L), hydraulic retention time (HRT) (۸, ۱۲, ۲۴ hours), and support media with carrier K۱ (۳۰%, ۵۰%, ۷۰%) were evaluated. According to the results, the yield of CIP removal at ۳۰%, ۵۰%, and ۷۰% of K۱, reaction of ۲۴ hours at MLSS ۳۰۰۰ mg/L was obtained ۵۰.۵%, ۶۸.۹%, and ۹۷.۶% respectively. In the same conditions, chemical oxygen demand (COD) removal was achieved ۲۶.۷۸%, ۳۰.۴۹%, and ۸۰.۰۷%, respectively. Results indicated that the MBBR process can be used as an effective approach for removing CIP and COD from hospital effluent. Moreover, these data suggested that the K۱ carrier could be useful in terms of mineralization and efficiency. Furthermore, development of biofilm in MBBR was mostly affected by K۱.

کلمات کلیدی: