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Study on biological filler-coupled biological process for phosphorus removal

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ABSTRACT

Based on the self-made new iron–carbon micro-electrolytic packing, a composite packing was developed, coupled with a membrane bioreactor, and the simulation of low C/N urban sewage was used as the research object. Use anaerobic aerobic bioreactor, adopt intermittent cultivation, and then continuous cultivation, control hydraulic retention time (HRT) to 3, 4, 5, 6, and 7 h by adjusting influent, PH of influent is 5.5, 6.0, 6.5, 7.0, 7.5, and 8.0. The high-efficiency start-up effect and optimized phosphorus removal characteristics of the composite-filled bioreactor were investigated. The results show that the intermittent start-up and continuous cultivation method can reduce the start-up time to 30 d, the film hanging effect is good; when the water inlet HRT = 7, PH = 7.5 ± 0.1, the total phosphorus removal rate reached 90.1%; biological phase observation, and scanning electron microscopy chart showed that iron–carbon micro-electrolytic materials have no segregation and passivation; comparison test it is proved that the composite filler reactor removes total phosphorus through iron–carbon micro-electrochemical physicochemical phosphorus removal and biological phosphorus removal, and the composite filler physical and chemical phosphorus removal plays a leading role in phosphorus removal.

Keywords: Composite filler; Phosphorus removal; Iron–carbon micro-electrolysis; Urban sewage; Bioreactor

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