

Development of Natural Purification for Polluted Lake using In-situ Biofilm Reactor

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Abstract

In this work, a submerged biofilm process is developed to purify polluted lake effectively. The submerged biofilm system consisting of aeration zone and anoxic zone was used for nitrification, organics removal and denitrification, respectively. In this reactor system, air supply has the both role for nitrification and circulation of lake water. The accumulated sludge at the bottom of the reactor system will be collected and discarded periodically. In the first year, small and shallow lake is being targeted for getting the efficiency of developed system, and the obtained results will be used for adopting large and deep lake finally.

After 7 months of the operation with submerged biofilm systems, the good results were observed in the lake. Except nitrogen contents, almost the treatment results of SS, turbidity, algae concentration, COD, and so on were continuously satisfied to the regulation of water quality for lake. pH was maintained within 7.4 -8.2. In initial state, as total phosphorus concentration showed in range of 0.09 - 0.1 mg/l, this lake was considered as eutrophicated lake, its value decreased and steadily showed from 0.01 to 0.03 mg/l as the reactor is being operated. The total nitrogen was also decreased and showed 30% level compared to the initial state. The decrease of 50 % of COD and 75% of Chl-a were achieved.

In future study, we concentrate our efforts to monitoring and preventing algae blooming under the limitation of phosphorus concentration.

References

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