

A b s t r a c t

T i t l e	The advantage of low pH operation in membrane separation bioreactor
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[summary] It may be possible to operate membrane bioreactors (MBR) require the formation on extreme conditions, such as pH three or less since the formation of flocs is not necessary in MBRs. If a biological treatment process can be operated with extremely acidic condition, the acidic wastewater containing organic micropollutants can be treated without neutralization and biologically treated wastewater can be mixed with other effluents to meet the water quality standard of pH. An experiment of continuous operation of MBR was performed to investigate the advantage of low pH operation between pH 2 and 3 for the removal of organic micropollutants and phenols by MBR. The experimental set-up was consisted of an activated sludge reactor with the volume of 10L and microfiltration membrane with pore size of 0.45 μ m. Pharmaceuticals were fed to the reactor with glucose and peptone. In addition, the removal of phenols (phenol, salicylic acid, and benzoic acid) added to the influent instead of glucose, was investigated. COD, pressure difference in the membrane process, microbial population and concentration of micopllutants were also measured. The removal of COD no less than 90% was observed with acidic condition as well as the neutral condition as a result of continuous operation for 110 days, though nitrification was suppressed on the acidic condition below 35%. The enhanced removals of indomethacin, diclofenac, naproxen by operating MBR under the low pH condition were observed, while the removals of propyphenazone, carbamazepine, clofibric acid were in the same ranges. When phenols were fed to the reactor instead of glucose, the removals were in the order of phenol, salicylic acid, and benzoic acid. In the analysis of biological community in the reactor, the prevalence of fungi was seen on the acidic condition compared with the case on the neutral pH condition.	