

## Up-Flow Sponge Submerged Biofilm Reactor for Municipal Sewage Treatment

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**Abstract :** An up-flow submerged biofilm reactor packed with sponge was investigated for sewage treatment. The reactor was operated two cycles as single aerobic (1-1 at 3.5 L/L.d HLR and 1-2 at 3.8 L/L.day HLR) and four cycles as single anaerobic/aerobic reactor; 2-1 and 2-2 at low HLR (3.7 and 3.5 L/L.day) and 2-3 and 2-4 at high HLR (5.1 and 5.4 L/L.day). During the aerobic cycles, 50% effluent recycling significantly reduces the system performance except for phosphorous. In case of the anaerobic/aerobic reactor, the effluent recycling, significantly improves system performance at low HLR while at high HLR only phosphorous removal was improved. Excess sludge production was limited to 0.133 g TSS/g COD with better sludge volume index (SVI) in case of anaerobic/aerobic cycles; (54.7 versus 58.5 ml/g).

**Keywords :** aerobic, anaerobic/aerobic, up-flow, submerged biofilm, sponge

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