

Advanced Treatment of Sewage Effluent using Hydroponic Bio-filter Method

오영택, 배상득, 박제철, 김동섭
(금오공과대학교, 수자원공사 수자원연구원)

The effluent from internal secondary sewage treatment discharge to rivers or lakes can cause the secondary pollution, due to the poorly treated nutrients. As a result, the target water quality improvement is limited a low level of 20-30%. Since the total load management and the target water quality management of nutrients becomes strict, it is necessary to develop advanced treatment process. In this study, from August 8 to October 22, 2003, we evaluated the water trait of the effluent focused on nutrients and organic treatment effect based on experiment on the secondary sewage treatment of "S" sewage treatment facility using aquatic plants(*Spirodela polyrhiza*, *Oenanthe javan-ica*, *Phragmites australis*) via a the pilot plant study. The results of the experiment, the average effluents of organic was COD 7.2 ± 1.1 mg/L, SS 1.1 ± 0.7 mg/L and DOC 5.1 ± 0.8 mg/L respectively, and average removal efficiencies of COD, SS, DOC were $16.8 \pm 8.4\%$, $67.1 \pm 15.9\%$, $22.1 \pm 12.9\%$ respectively. Also, effluents of $\text{NH}_3\text{-N}$, $\text{NO}_3\text{-N}$, T-N, DIP, T-P were 1.2 ± 1.1 mg/L, 8.1 ± 1.2 mg/L, 9.7 ± 1.1 mg/L, 1.189 ± 0.150 mg/L and 1.014 ± 0.166 mg/L respectively, and average removal efficiencies of $\text{NH}_3\text{-N}$, $\text{NO}_3\text{-N}$, T-N, DIP, T-P were $56.4 \pm 23.7\%$, $20.8 \pm 12.0\%$, $19.2 \pm 10.0\%$, $19.4 \pm 12.6\%$ and $20.9 \pm 11.3\%$ respectively. The results of this study showed that we can achieve better water quality if the advanced treatment process using aquatic plants is used to remove nitrogen, phosphate and organism. A stable water quality could be obtain within the permissible range of sewerage effluent regulation standards that will be effective after 2004.