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NALINEE LAUNGRUNGRONG : A MICROFILTRATION PROCESS FOR WATER SUPPLY PRODUCTION. THESIS ADVISOR : ASST. PROF. CHAVALIT RATANATAMSKUL, Ph.D., 264 pp. ISBN 974-03-1044-3.

The purposes of this research was to study the performance of microfiltration (MF) process for water supply production by using raw water in canal at the intake of Bangkhen Water Treatment Plant during low and high turbidity water. The research was carried out in three experiments by using two hollow-fiber membrane modules with the pore sizes of 0.1 and 0.4 μms. The first experiment was to obtain the optimum flux from the studied flux of 0.1, 0.2, 0.3 and 0.4 m^3/m^2.day. The second experiment was to investigate a long-run operation using the optimum flux from the first experiment. The third experiment, the application of coagulation process as a pre-treatment of MF process was done to improve the performance of the long-run operation.

The results showed that the optimum fluxes were 0.2 and 0.3 m^3/m^2.day for both membranes. However, the increase in transmembrane pressure was higher in the case of the membrane with 0.1 μm–pore size. Removal efficiencies in terms of turbidity, color and Fe were not significantly different from those of the membrane with 0.4 μm–pore size for all cases. For UV260 and TOC removal efficiencies, it was found that the membrane with 0.4 μm–pore size had higher removal efficiencies than those of the membrane with 0.1 μm–pore size in the case of the high turbidity water at the flux of 0.2 m^3/m^2.day. Comparision between flux 0.2 and 0.3 m^3/m^2.day, it was found that the flux of 0.3 m^3/m^2.day yielded a more increase in transmembrane pressure than the flux of 0.2 m^3/m^2.day but it had no effect on removal efficiencies. The study of pretreatment by coagulation process showed that the pretreatment could reduce cake layer formation on membrane surface by observing from the constant transmembrane pressure all the time of long–run operation. Removal efficiencies in terms of turbidity, color Fe and TOC were not significantly different from those of the raw water without pretreatment. For UV260 removal efficiencies, it was found that the raw water with pretreatment had lower removal efficiencies than that of the raw water without pretreatment. Furthermore, permeate water could comply with the standard of drinking water in terms of turbidity, color, Fe, Mn and coliform bacteria.