

Hybrid Water Treatment Process of Multi-channel Ceramic MF and Photocatalyst Loaded PES Beads: Effect of Organic Materials

박지용*, Bolor Amarsanaa
한림대학교
(jypark@hallym.ac.kr*)

We investigated the effect of organic matters and role of microfiltration (MF), adsorption, and photo-oxidation in hybrid process of multi-channel ceramic microfiltration and photocatalyst oxidation for advanced drinking water treatment. The space between the outside of 7 channels ceramic membrane (0.4 μm) and the module inside was filled with polyethersulfone (PES) beads loaded with TiO_2 powder. And UV with 352 nm was radiated from outside of acryl module. A quantity of humic acid and kaolin was dissolved. Resistance of membrane fouling (R_f) dramatically dropped with increased concentration of humic acid. Also, treatment efficiencies of turbidity and UV_{254} absorbance were very outstanding as 96.7~98.3% and 80.2~85.0% respectively. Then, R_f of experiment without UV irradiation (MF+ TiO_2) and only MF at humic acid of 4 mg/L were compared with the previous experiment with UV irradiation (MF+ TiO_2 + UV). R_f increased as simplifying from process of MF+ TiO_2 + UV to MF. The portions of treatment efficiency of UV_{254} were 70.8% for MF, 0.2% for TiO_2 bead adsorption, and 10.1% for photo-oxidation, respectively.