ABSTRACT

With an increase in awareness of water scarcity, water reuse has received significant attention. The reuse of sewage has attracted attention, because sufficient amounts of sewage can be obtained even in a drought. As a large amount of algae has been generated owing to the lack of oxygen due to global warming, concerns about phosphorus have rapidly increased. This study explores the removal of phosphorous in treated sewage and shows how sewage can be reused. A combined electrocoagulation (EC) and membrane filtration process was used in order to remove turbidity, particulate matter, colloids, and total coliforms, illustrating the suitability of sewage reuse. The optimal EC conditions for phosphorus removal were determined including the electrode type and spacing, reaction time, temperature, voltage, and current. Optimal conditions for the membrane process, such as pressure and time, were also established. Analysis of zeta potential and distribution of particle size demonstrated the coagulation treatability of particles, while backwashing confirmed the recovery of the film. The purpose of this study is (i) to show how phosphorus and other contaminants can be removed by advanced processes such as a combined EC and membrane process and (ii) to investigate the quality of water obtained from this process.

Keywords: Sewage treatment; Electrocoagulation; Phosphorus removal; Aluminum; Membrane; Sewage reuse

Phosphorus removal by a combined electrocoagulation and membrane filtration process for sewage reuse

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