

The potential of a polysulfone (PSF) nanofiltration membrane as the end stage treatment technology of aquaculture wastewater

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ABSTRACT

Aquaculture produces considerable quantities of organic matter, ammonia, and phosphorus during cultivation processes. Aquaculture waste left without proper treatment may cause deterioration to the water quality inside the pond or receiving water. The polysulfone (PSF) membranes were prepared via a dry/wet phase inversion technique and were analyzed to determine their potential for aquaculture wastewater treatment. The results indicate that the tailored membranes have a good quality permeate which can retain up to 66% ammonia, 85% total ammonia (TAN) and 95% phosphorus with high flux permeability (0.499–0.712 L/m².h). This promising result was observed at pH 6 with a 6-bar applied pressure. It was also found that by altering the pH, the membrane surface charge changed. Furthermore, membrane surface charge plays an important role in the enhancement of membrane performance. This study indicates that membrane technology has high prospective as a tertiary treatment for aquaculture wastewater and helps to elevate aquaculture production quality.

Keywords: Ammonia; Aquaculture; Polysulfone membrane; pH; Surface charged

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