

Comparison of phenol removal in synthetic wastewater by NF or RO membranes

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ABSTRACT

The performance of NF membranes (NF90, NF97, NF99, NF99HF) and RO membranes (RO98pHt, RO99, SW) to remove phenol in phenolics-containing synthetic wastewater was compared. In terms of both rejection and permeate flux, NF97 and RO98pHt showed superior performance over other membranes. Water and phenol permeability constants were obtained according to solution-diffusion model and influences of cross flow (0.39–0.96 m/s), temperature (20–40°C), pressure (5–30 bar), phenol concentration (10–1,000 ppm), pH (3–11) salt concentration (1,000–3,000 ppm) on the phenol rejection were investigated in this work. Results indicate that cross flow, phenol concentration and salt concentration have little influence on phenol rejection, while phenol rejection decreases with temperature increase, and it increases with pressure increase. The pH showed significant effect on phenol rejection.

Keywords: Nanofiltration membrane; Reverse osmosis membrane; Phenol rejection

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