Prediction of reverse osmosis membrane fouling due to scale formation in the presence of dissolved organic matters using genetic programming

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ABSTRACT

Scale formation of soluble salts is one of the major factors limiting the performance of reverse osmosis (RO) membranes for desalination. However, it is difficult to predict membrane fouling due to scale formation in a complicated feed water containing dissolved organics such as humic substances. This study aims at prediction of the complicated fouling phenomenon by scale formation in the presence of dissolved organic matters. Experimental studies with model solutions were conducted in a small batch filtration device. Humic acid and calcium sulfate were used as model dissolved organic matters and scale-forming salts. A genetic programming technique was applied to predict the effect of dissolved organic matters on scale formation.

Keywords: Desalination; Scale formation; Dissolved organic matters; Humic substances; Fouling; Genetic programming

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