

A new approach to the characterization of reverse osmosis membrane by dynamic hysteresis

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ABSTRACT

Physical aspects of dynamic hysteresis for characterizing reverse osmosis (RO) membranes have been investigated. Dynamic hysteresis was used as a parameter of showing physical surface characteristics of RO membranes. Automated microbalance was utilized to determine dynamic hysteresis based on the Wilhelmy plate method. Dynamic hysteresis determined with non-polar liquid was related to physical surface characteristics including surface roughness and heterogeneity determined by atomic force microscopy imaging and analysis. A remarkable correlation between dynamic hysteresis and surface heterogeneity was obtained when nonpolar liquid was used during the measurements. Dynamic hysteresis increased as the surface heterogeneity of RO membrane increased.

Keywords: Membrane characterization; Dynamic hysteresis; RO membrane; Physical surface characteristics

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