Experimental study of backwash cleaning on organic-fouling in reverse osmosis system

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Membrane fouling inevitably occurs in pressure-driven membrane. It is a major drawback of reverse osmosis (RO) membrane systems because it leads to a big loss in energy efficiency of an industrial RO plant. CIP (Cleaning-in-place) with chemicals is the typical way to remove the accumulated foulants on the membrane. However, the method causes the damage of membrane, and the damage leads to shorten lifespan of membrane. As an alternative, backwash cleaning has become a promising method to reduce the fouling. The backwash method uses the osmotic pressure difference between the feed and permeate side solutions of membrane during temporally turning off the system. The backwash cleaning in RO system improves to increase production and reduce the energy consumption. The aims of this study are to demonstrate the high cleaning efficiency of backwash process. We investigated the effect of cleaning time and cleaning interval of backwash cleaning. In addition, lab-scale experiments were conducted to compare the cleaning efficiency of backwashing and CIP.