생물막반응기의 화학세정주기 스케쥴링을 위한 TMP 예측 모델 개발

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A novel fouling monitoring methodology based deep learning has been validated using transmembrane pressure (TMP) data of a full-scale membrane bioreactor (MBR) system operated with wastewater. Future sequences of TMP were forecasted utilizing variant structures of recurrent neural networks RNNs. Then, the forecasted values of TMP were used to determine the exact chemical cleaning time using the exponential weight moving average (EMWA) control chart. Gated recurrent unit (GRU) structure outperforms the other RNN structures (RMSE = 1.04 kPa, MAPE = 2.92%, MAE = 0.85).

Keywords: Membrane bioreactor (MBR); MBR fouling; Recurrent neural networks; Membrane chemical cleaning interval; Climate change adaption.

Acknowledgments This work was supported by the National Research Foundation (NRF) grant funded by the Korean government (MSIT) (No. NRF-2017R1E1A1A03070713), and Korea Ministry of Environment (MOE) as Graduate School specialized in Climate Change.