ABSTRACT

In this paper, the structure optimized support vector machine (SVM) model was applied to predict the membrane permeate flux during dead-end microfiltration of activated sludge suspensions from sequencing batch reactor (SBR) with different experimental samples. The membrane permeate flux was considered as a function of mixed liquor suspended, temperature, dissolved oxygen, hydraulic retention time, transmembrane pressure, and operating time. Excellent agreements between the predicted values of SVM model and the experimental data demonstrated that SVM model has sufficient prediction accuracy. Furthermore, the results showed that the predicted values of SVM model agreed well with experimental data at different experimental samples in comparison with back propagation artificial neural network (BP-ANN) model. From the simulation results, the conclusion can be derived that SVM model outperforms BP-ANN model when the experimental samples sizes are small.

Keywords: SVM; ANN; Membrane permeate flux; Prediction; Comparison