



Studies on prediction of separation percent in electro dialysis process using neural networks

Jing Guolin*, Du Wenting, Xing Lijie

*College of Chemistry and Chemical Engineering, Northeast Petroleum University, Daqing 163318, PR China
Tel. +86-459-650-3502; Fax: +86-459-650-3502; e-mail: jingguolin@yahoo.cn*

Received 29 December 2010; Accepted 18 August 2011

ABSTRACT

In the electro dialysis process there is a nonlinear relationship between a variety of influencing factors and separation percent (SP), and the relationship is hard to predict. This paper discusses a predictable method via back propagation (BP) neural networks and introduces BP neural networks to forecast separation percent in the electro dialysis process. Moreover, the paper aims to predict the nonlinear relationships between separation percent and its four influencing factors (voltage, concentration, temperature, flow rate). Back propagation neural networks is based on multilayer feedforward neural networks, and achieves nonlinear mappings from inputs to outputs, it is called BP neural networks, hence this method is suitable to predict the nonlinear relationship of separation percent and its influencing factors in the electro dialysis process. We obtained predictable values of separation percent using BP neural networks. Separation percent from experiments compared with its predictable values, and the correlation coefficient was more than 0.99, MSE and MSRE were less than 0.2. Prediction accuracy was high in the range of permissible error, and acquired a good fitting. Therefore, it is verified that BP neural networks is a nice prediction performance and reference value in the electro dialysis process.

Keywords: Electro dialysis; BP neural networks; Separation percent; Predictable value; Concentration; Desalinated water

*Corresponding author.