

An Approach for Coagulant Dosage Optimization Using Soft Jar Test: A Case Study of Bangkhen Water Treatment Plant

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Abstract : The most important process of the water treatment plant process is the coagulation using alum and poly aluminum chloride (PACL), and the value of usage per day is a hundred thousand baht. Therefore, determining the dosage of alum and PACL are the most important factors to be prescribed. Water production is economical and valuable. This research applies an artificial neural network (ANN), which uses the Levenberg-Marquardt algorithm to create a mathematical model (Soft Jar Test) for prediction chemical dose used to coagulation such as alum and PACL, which input data consists of turbidity, pH, alkalinity, conductivity, and, oxygen consumption (OC) of Bangkhen water treatment plant (BKWTP) Metropolitan Waterworks Authority. The data collected from 1 January 2019 to 31 December 2019 cover changing seasons of Thailand. The input data of ANN is divided into three groups training set, test set, and validation set, which the best model performance with a coefficient of determination and mean absolute error of alum are 0.73, 3.18, and PACL is 0.59, 3.21 respectively.

Keywords : soft jar test, jar test, water treatment plant process, artificial neural network

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