Prediction of Chemical Oxygen Demand of Primary Clarifier Effluent in Wastewater Treatment Plant

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Abstract—*The industrial effluent treatment plant or wastewater treatment plant (WWTP) is a facility to remove pollutants from wastewater. Generally, in WWTP chemical oxygen demand, pH, total suspended solids, influent flow rate, biochemical oxygen demand, total dissolved solids, ammoniacal nitrogen etc. are observed to maintain their values as per the government law. In this paper Artificial neural network is applied to predict chemical oxygen demand present in effluent of primary clarifier. Primary clarifier is the physical subsystem of WWTP to remove suspended solids from the influent wastewater. Three COD prediction models are developed using Levenberg-Marquardt (LM), One Step Secant (OSS), and BFGS quasi newton algorithm. The R-squared values obtained for LM, BFGS and OSS are 0.99, 0.98 and 0.89 respectively. The root mean square error for LM, BFGS and OSS are 190.1, 209.4 and 573.5 respectively. As per the results obtained the Levenberg-Marquardt model predict better COD as compared to the COD predicted by BFGS and OSS models.*

Keywords: *Wastewater, Neural network.*