Conventional control algorithms used in pH control systems give inefficient performance, leading to use of large mixers. To improve the neutralization control process, an ANFIS based advanced controller has been proposed. In this paper, method of design of adaptive controller based on neurofuzzy technique is presented. The method uses ANFIS methodology to
automatically generate fuzzy rule base and fuzzy membership functions, which are iteratively adjusted by hybrid learning algorithm that combine the backpropagation gradient descent and least square method to create a fuzzy inference system. In the modeling task, the dynamics of the process is determined by Takagi-Sugeno fuzzy model in order to obtain a suitable structure for the ANFIS based Neurofuzzy controller. ANFIS is used to identify the twelve linear and sixteen nonlinear parameters that describe the behavior of the pH neutralization process. The resulting neurofuzzy controller is simulated by using reference model. Simulation results proved the tracking and adaptive capability of neurofuzzy system applied to pH neutralization process.

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**Index Terms**

Computer Science  
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**Key words**

pH neutralization  
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