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Abstract

Over a number of years, pH control of neutralization process is recognized as a benchmark for modeling and control of nonlinear processes. This paper first describes dynamic modeling of pH neutralization process. Thereafter fuzzy logic based pH control scheme for neutralization process is developed. Further, a two-dimensional (2-D) lookup table is generated based on defuzzification mechanism of fuzzy inference system (FIS). Finally, using this lookup table, a neural network control for pH neutralization process is developed. Performances of fuzzy logic based control and lookup table based neural network control for servo and regulatory operations are compared based on integral square error (ISE) and integral absolute error (IAE) criterions. Results indicate that lookup table based neural network control performs better than fuzzy logic based control.

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Index Terms

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Keywords

Fuzzy logic lookup table neural network neutralization process pH control