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Modelling Selection of Distillation Control Structure for Energy Efficient Operations for Methanol-water and Benzene-Toluene Binary System

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Abstract

Distillation process unit poses great challenge to control engineers because of complexities in its design for variety of configurations with different operating objectives, and significant interactions among the control loop and specified constraints. This work presents a neutral network based strategy for the modeling and optimization of distillation columns for methanol-water and benzene-toluene binary systems by incorporating the second law of thermodynamics. The second law of thermodynamics analysis indicates how well a system is performing compared to the optimum possible performance and hence gives a good indication of the actual energy use of the process. Aspen HYSYS was used for the simulation of the distillation systems. Operating conditions for the inputs to the model comprises feed flow rate, feed temperature and product specification flow rates. Neutral network model for exergy efficiency and product compositions are developed from simulated process operation data and are used to maximize energy efficiency while satisfying product quality constraints. The result obtained from the modeling of methanol-water and benzene-toluene binary systems separation columns showed improvement in the exergy efficiency of the system from 43.35% to 54.63% respectively.

Biography:

Iganga Christian U has completed her ph.d from Alex Ekwueme Federal University-Nigeria. Now she is Working as Department of Chemistry Chemistry Department, Ebonyi State College of Education, Ikwo.

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