Role of Uncertainty in CSTR Operation Optimization Using Chance Constrained Programming

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This work shows the effects of few parameters having uncertainties for the optimization problem. The objective is to minimize the cost under desired product purity for uncertain parameters. A set of uniformly distributed uncertain random variables for kinetic energy (Ei) and frequency factor (ki0) in the Arrhenius equation were applied to see its effects on total volume of CSTR and hence minimizing the cost. then efforts are made to optimize the considered stochastic system with chance constrained programming. During optimization violation of constraints are allowed by defining different confidence levels. Conclusively the dependence of optimized results on different confidence level (α) is obtained. Here confidence level is a user defined parameter. Thus the uncertainty in in the parameters and its dependence on volume rely on proper selection of confidence level. This study was supported by a grant from the Gas Plant R & D center funded by the Ministry of Land, Transportation and Maritime Affairs (MLTM) of the Korean government. This research was also supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).