

A Plant-wide Optimization Based on Sensitivity Analysis

장경수, 이인범, 한종훈^{1,*}
포항공과대학교; ¹서울대학교
(chhan@snu.ac.kr*)

Chemical plants which consume lots of energy are not operating in the best conditions due to their own peculiar nonlinearity, instability, and diverse disturbances. In order to improve this, the plant wide optimization was performed. As a case study, a TPA (Terephthalic Acid) process is considered. The process was modeled with simulation program, and the process carried out sensitivity analysis to investigate the variables which are strongly able to affect economy of energy. First of all, the variables which are able to have an effect on the profit of the whole process were chosen through interviews and the process analysis. And then, more influential variables were screened by sensitivity analysis to observe the extent of effect on the profit. As the next process, the plant-wide optimization was performed by adding each unit of plant in turn to discover the peak of yield with the minimum variables. Consequently, the significant three variables were obtained through the above method. And then, the selected decision variables were optimized after As a result, it was seen that the plant are expected to save the 350 million won of energy annually without additional investment for facilities or remodeling of the plant.