

Distillation column control using Multivariable PID controller based on Model Predictive Control optimization

조하늬, 박병언, 이인범†  
포항공과대학교

A proportional-integral-derivative controller (PID controller) has been widely used for industrial process control because of simplicity, good control performance and excellent robustness to uncertainties. But, modern plants have become increasingly complex due to the elevated performance requirements such as product quality, environment regulation and so on. According to the increased complexity of plant, interactions between process variables have also been rising and it requires more advanced control strategies to obtain improved control performance. One of the strategies is model predictive control (MPC). Using the process dynamic model and current measurements, it can predict the future output values. So, by adding the cost or energy saving function in every sampling time of MPC calculation and combining the results of optimization, MPC calculation and the PID form, PID control parameters can be derived. Using PID controller based on model predictive control optimization, we can keep the advantages of PID control and improve PID control performance in case of complex process. Given that it considers the cost or energy saving, it will be more practical control strategy in terms of economic process operation.