Dynamic Response Study of a MEA Process for Flexible Operation

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As growing concerns for global warming, regulations for CO_2 emission from the power plants have been tightened. Monoethanolamine(MEA) based absorption process is the most mature CO_2 capture technology which can be developed in commercial scale and retrofitted easily into existing power plants as a post-combustion capture. The problem of adding the MEA process to the power plant is the significant power output loss due to the large amount of regeneration energy consumed. Flexible operation is one of options for mitigating the loss by mainly adjusting load of stripper in response to varying electricity price. However, flexible operation itself can arise a disturbance in dynamics of the process such as a delay response. In this study, dynamic model of the MEA process has been developed in gPROMS and dynamic responses by varying operation variables are studied under flexible modes.