

Disturbance modeling of MPC for the inferential control of a gasifier

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Model predictive control strategy is applied for multivariable and inferential control of the entrained-flow gasifier in the IGCC power plant. Generally, the disturbance model is used for the offset-free control. In order to compensate the effects of model mismatch and unmeasured disturbance, assume the existence of disturbance when predict future outputs. Thus, the design of disturbance model significantly impacts on control performance. For the inferential control, the disturbance model is more critical to the control performance because the disturbance model directly impacts on states estimation of the unmeasured controlled variable. Especially, in this gasifier control study, number of disturbances is greater than number of measurements. Therefore, disturbance selection and modeling is more challenging. We proposed disturbance model strategy to control the unmeasured slag thickness of the gasifier.