Enhanced IMC-based Control of Integrating Cascade Processes with Time Delays

S. Uma, M. Chidambaram, A. Seshagiri Rao[1], 김용수[1],
유창규[2,*]
인도 NIT대학; [1]경희대학교 환경응용과학과;
[2]경희대학교 국제캠퍼스
(ckyoo@khu.ac.kr*)

This paper presents a simple cascade controller in the enhanced modified Smith predictor structure for control of integrating processes with/without zero. The proposed structure consists of two control loops, a secondary inner loop and a primary outer loop. The method has totally three controllers of which the secondary loop has one controller and the primary loop has two controllers. The secondary loop controller is designed using IMC technique. The primary loop set point tracking and disturbance rejection controllers are designed using direct synthesis method. The primary set point tracking controller is designed as a PID with lag filter and the primary disturbance rejection controller is designed as a PD with lead-lag filter. Simulation studies have been carried out on various cascade integrating processes with/without zero. The present method gives significant disturbance rejection both in the inner and outer loops. This work was supported by BK21, by the Korea government (MEST) (KRF-2009-0076129) and by Seoul R&BD Program (CS070160).