Optimal Control of SMB process using RMPC Technique

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A novel optimization-based advanced control technique for simulated moving bed (SMB) is proposed. This technique is a model-based control technique developed by adding the basic concept about Two-stage batch control to Repetitive model predictive control (RMPC) which is suited for periodic process. A linearized reduced order model, which accounts for the periodic nature of the SMB process, is used for online optimization and control. This control technique utilizes the past cycle data as well as the real-time measurements at the raffinate and extract outlets used as the feeback information. The calclulated input adjustment maximize the productivity and minimize the desorbent consumption subject to constraints on product purities. Through a application on a virtual SMB process, this approach was found to perform quite satisfactorily regardless of a series of typical plant disturbances and significant model uncertainties.