

Repetitive control of SMB process based on successive linearization of cubic spline collocation model

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A novel repetitive control (RC) method for the simulated moving bed (SMB) process is proposed. The method was designed on the basis of a fundamental SMB model linearized successively around the operating trajectories in the previous period. It performs regulation of extract and raffinate purities averaged over each period. The SMB model for successive linearization was derived by applying the cubic spline collocation method combined with the far-side boundary condition to the partial differential SMB equation. Through numerical studies, effectiveness of repeated linearization on the RC performance has been investigated against set point and disturbance changes and also against model error.