

Strategies for Improving the Performance of Simulated Moving Bed Chromatography

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Simulated moving bed (SMB) chromatography has received considerable attention because it was a continuous and effective separation process for valuable materials such as enantiomers.

For the pharmaceutical industry, extremely high purity is required to achieve the goal of developing safer and more effective drugs. Often, one enantiomer of a racemic mixture demonstrated side-effects or toxicity.

In this study, a new “partial-discard” operation strategy was developed to improve the performance, especially purity, achievable in simulated moving bed (SMB) chromatography. The “partial-discard” concept was also applied to the “partial-feed” operation to enhance the purity as a combined “partial-feed with partial-discard” operation. The results were compared to the conventional “total-feed and total-product” operation approach in consideration of purity, enrichment, and recovery. The results will provide a valuable engineering strategy to improve the performance of the SMB chromatographic process.