

Partial Fractionation and Recycle of Extract and Raffinate for Improving Product Purity in SMB Unit

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Since SMB (Simulated Moving Bed) had been developed at 1960s, it was studied and applied to produce a product in petrochemical, fine chemical, and sugar industries. The main reason why SMB was widely used in many industries is that SMB is a continuous chromatographic separation process and it can achieve large-scale production with relatively low operation cost. Recently, SMB is being applied for the separation of biopharmaceuticals that extremely high purity of products is necessary to inject or use into the human body. To achieve higher purity of products, we developed an operating strategy. If raffinate material is eluted at extract port, concentration of the product (extract material) will be decreased, and vice versa. And this situation may be occurred in a practical SMB operation. Our strategy is a new method that partially-fractionated raffinate and extract is recycled into SMB unit at assigned recycle-Feed ports with ModiCon operation. We used a conventional four-zone (2-2-2-2) SMB system with two recycle-Feed ports. From the results, the purities of products were increased by increasing the fractionation ratio of extract and raffinate.