

Visual Demonstration of Simulated Moving Bed

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SMB (simulated moving bed) is a continuous chromatographic process and simulated TMB (true moving bed) process by shifting periodically port position. The SMB process has many advantages over batch chromatography. It is difficult to understand the process due to the complexity of its operation. In this work, we tried to show the binary separation visually using colorful two components. The mixture consists of Blue Dextran and Orange G, which have blue and orange color respectively. During the operation, this colored components helps us to understand the process easily.

Four zone SMB with open loop system was applied to the experiment. Operation condition is obtained by Standing Wave Design and is optimized to have high purity in both extract and raffinate position. Mass transfer coefficient is determined by single pulse tests at several flow rates. The histories of extract and raffinate showed good agreement with simulation results. The purities of the Blue Dextran in the raffinate and the Orange G in the extract were 98.89% and 99.49%, respectively. The yields of two components were over 98% in the raffinate and extract.