

•• Case Study 1

The following case study nicely illustrates the benefit of an SMB separation step and racemization as an integrated part of a multistep synthesis.

After the synthesis, 45 kg of racemic material were obtained and submitted to SMB separation. With 1 kg of chiral stationary phase, at a productivity of ca. 2.1 kg racemate / day and ca. 150 L solvent consumption / kg racemate, this amount was successfully separated into its enantiomers.

A part of the solvent was recycled to the SMB separation. A batch of 20.5 kg (yield ca. 45.6 %) of the target enantiomer and a batch of 22.6 kg non-target enantiomer was obtained after the work-up.

This batch of non-target enantiomer was submitted to racemization and yielded 20.8 kg of racemate, which was again separated on SMB with the same conditions. A batch of 10.1 kg (yield ca. 22.4 % based on the original 45 kg of racemate) of the target enantiomer and a batch of 10.6 kg non-target enantiomer was obtained after the corresponding work-up.

Overall, the yield of this SMB step could be increased to ca. 68 % due to the racemization and afforded another batch of 10 kg racemate after a second racemization. The chiral HPLC purity of the target enantiomer was 100 % a/a HPLC (Spec: > 99.0 % a/a HPLC) with a chiral purity of the other enantiomer of 94 % a/a HPLC.



•• Case Study 2

Our second case study is a nice example for a very efficient SMB separation step as part of the synthesis with identical performance also in several reloads. In a first SMB separation, 67 kg racemate were successfully separated into its enantiomers with a productivity of ca. 5.1 kg racemate / day, which was rather high, and ca. 47 L solvent consumption / kg racemate. The target enantiomer was obtained with a chiral purity of 100.0 % a/a HPLC (Spec: \geq 99.0 % a/a HPLC) and a yield of ca. 45 %. 1 kg of chiral stationary phase was used for this separation.

The same chiral stationary phase was then re-used for several reloads of this enantiomer separation on 80 kg – 100 kg scale. All reloads had the same performance regarding productivity, solvent consumption, chiral HPLC purity and yield as the original SMB separation.