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1 Evaluation of Scale-up From Analytical to Preparative Supercritical Fluid

2 Chromatography

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11 Abstract

12 An approach for reliable transfer from analytical to preparative scale supercritical fluid chromatography
13 was evaluated. Here, we accounted for the conditions inside the columns as well to the fact that most
14 analytical instruments are volume-controlled while most preparative scale units are mass-controlled. The
15 latter is a particular problem when performing pilot scale experiments and optimizations prior to scaling
16 up to production scale. This was solved by measuring the mass flow, the pressure and the temperature
17 on the analytical unit using external sensors. Thereafter, it was revealed with a design of experiments
18 approach that the methanol fraction and the pressure are the two most important parameters to control
19 for preserved retention throughout the scale-up; for preserved selectivity the temperature was most
20 important in this particular system. Using this approach, the resulting chromatograms from the
21 preparative unit agreed well with those from the analytical unit while keeping the same column length

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