

Green Chromatography Through the Use of Thermoresponsive Polymers and Application in Biochemical Assays

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Green chromatography can be achieved by the use of new intelligent stationary phases. These phases consist of thermoresponsive polymers coupled to conventional column material. In water The hydrophobicity of poly-(N-isopropylacrylamide) (PNIPAA) [1] and poly-(N-vinylcaprolactam) (PVCL) [2] changes with the environmental temperature. This allows control of solute retention and separation by temperature and for the use of pure water as mobile phase.

The two stationary phases were synthesized and columns for HPLC were packed. The fundamental chromatographic parameters, such as retention, efficiency, optimal flow rate, etc. were studied. Several mixtures could be successfully separated with acceptable results.

An applications of interest is the use of TRLC in on-line coupled biochemical assays to screen for enzyme inhibitors. Such a universal on-line technique could have great importance in pharmaceutical development, but when using a conventional reversed phase HPLC technique the presence of organic modifiers disrupt the enzymatic reactions. By using TRLC and therefore pure water, these difficulties could be overcome.

[1] F. Lynen, J. Heijl, F. Du Prez, R. Brown, R. Szucs, P. Sandra, *Chromatographia* (2007), **66**, 143-150

[2] B. Miserez, F. Lynen, A. Wright, M. Euerby, P. Sandra, *Chromatographia* (2010), **71**, 1-6