Temperature-Responsive Chromatographic Separation of Bisphenol A with Water as a Sole Mobile Phase

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A simple and rapid method for bisphenol A (BPA) analysis using temperature-responsive liquid chromatography has been developed. A thermoresponsive polymer, poly(N-isopropylacrylamide) (PNIPAAm) was used for the modification of the silica surface. The surface exhibits temperature-regulated hydrophilic/hydrophobic property changes in water. Therefore, solute interaction with the surface is easily controlled by changing the column temperature using a constant aqueous mobile phase. In temperature-responsive chromatography in which only water is used as the sole mobile phase, we achieved the successful separation of BPA. With the use of water as a mobile phase in the HPLC system, it has become possible to greatly reduce the background noise in UV and fluorescence detection. The ability of the proposed temperature-responsive chromatography to analyze BPA without the use of organic solvents is advantageous from the point of view of environmental issues.