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Surface radical chain-transfer reaction in deep eutectic solvents for preparation of silica-grafted stationary phases in hydrophilic interaction chromatography

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Abstract

In this paper, deep eutectic solvents (DESs) were firstly used as new and green solvents for the preparation of polymer-grafted silica stationary phases. 1-Vinylimidazole and acrylic acid were homopolymerized and copolymerized on silica *via* surface radical chain-transfer reaction in the DESs. Three stationary phases including poly(1-vinylimidazole)-, poly(acrylic acid)-, poly(1-vinylimidazole-co-acrylic acid)-grafted silica were obtained and characterized by elemental analysis and Fourier transform infrared spectroscopy. Their hydrophilic interaction chromatographic properties were investigated for separation of nucleosides, nucleobases, saccharides and amino acids. The retention changes of nucleosides and nucleobases on these columns were investigated under different chromatographic conditions including acetonitrile content, salt concentration, pH of mobile phase and column temperature. The repeatability of these columns was also investigated. The results demonstrate that DESs can be used as new media for the synthesis of silica-based stationary phases by homopolymerization and copolymerization on the

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