

Abstract

The aim of this study is a preparation of polyaniline stationary phases doped with silver for application in HPLC. Various polyaniline coated stationary phases differing in the addition of AgNO₃ were polymerized. Some of them were subjected to Ag sedimentation, in others AgNO₃ was added after polymerization. Stationary phases were investigated by scanning electron microscopy, atomic absorption spectroscopy, Raman spectroscopy, and Fourier transformation infrared spectroscopy. Columns filled with prepared stationary phases were compared with silver-free polyaniline column by separating a mixture consisting of caffeine, theobromine and theophylline in three chromatographic modes (NP-pure ACN, HILIC-98/2 (v/v) ACN/water and RP-20/80 (v/v) ACN/water) at a flow rate of 5 μL/min with UV detection at 265 nm and also by separating a mixture of 2'-aminoacetophenone, 3'-aminoacetophenone and 4'-aminoacetophenone in the same chromatographic modes, at a flow rate of 5 μL/min except from RP mode where a flow rate of 10 μL/min was used to accelerate separation. Polyaniline-coated columns doped with silver showed different selectivity in the RP mode of the mixture of caffeine, theobromine and theophylline when compared to polyaniline-coated columns without the addition of silver. Further, the columns were tested for hydrophobicity/hydrophilicity and ion exchange characteristics by simple chromatographic assay. This test showed that the columns where the silver was added prior to the start of the polymerization had, to one exception, similar hydrophilicity, greater than that of a column without silver. The column doped with silver after polymerization exhibited the greatest hydrophilic character, comparable with the silica gel stationary phases.

Key words: HPLC, polyaniline, stationary phase, silver