Abstract

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Title of Thesis: HILIC separation of acyclovir and its degradation product

This thesis was aimed to test the retention behavior of acyclovir and its degradation product guanine on zirconia-based column with carbon layer - ZirChrom®CARB under hydrophilic interaction liquid chromatography (HILIC). The thesis uses findings from previous paper done on the same column, which was aimed to analyze the retention under HILIC conditions of polar compounds and xanthines, which structure are similar to our compounds. In this thesis the influence of temperature, concentration of ammonium acetate and trifluoroacetic acid, pH and various composition of mobile phase was studied. With increasing temperature the retention of analytes has decreased. Presence of ammonium acetate as a Lewis base in mobile phase develops a competition for binding Lewis acids sites on the surface of zirconia column. With higher concentration of ammonium acetate the retention of analytes decreases and the carbon layer participates in the mechanism of the separation. The retention of both analytes decreases with the addition of methanol to the mobile phase, contrary to the mobile phase without the added methanol. Also the peaks symmetry of acyclovir and guanine is better with the methanol addition. The process of separation is described as a complex mechanism that most likely involved the ligand exchange, hydrophobic and hydrophilic interaction was involved in the retention of the analytes.