

Abstract

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Title of Thesis: Separation of Aciclovir and its Degradation Product

This work investigated the retention behavior of aciclovir and its degradation product guanine using hydrophilic interaction liquid chromatography (HILIC). A column containing porous graphitized carbon (PGC) called HypercarbTM was used for analysis. The work builds on the findings of the diploma thesis of Lucie Bouzková (2016) and Lenka Teplá (2017), which dealt with the retention behavior of these analytes on a zirconium column modified with elemental carbon ZirChrom[®]-CARB. The effect of the presence of 0.1% acetic acid and 0.1% trifluoroacetic acid in the mobile phases on the retention of aciclovir and guanine was investigated. Furthermore, the effect of concentration of ammonium fluoride, diethylamine and phosphate buffers in mobile phases on the elution of analytes was studied. The mobile phases also contained different compositions of the organic component. In addition, different ratios between the aqueous and organic components were used. The mechanism of retention on the used column is related to many factors, is very complex and has not been fully clarified yet. Despite its hydrophobicity, graphitized carbon is able to separate polar analytes from each other. The presence of trifluoroacetic acid in the mobile phase in most cases shortened the analysis time and improved the symmetry of the peaks. In contrast, the use of ammonium fluoride and phosphate buffers has not been very successful. With the addition of methanol to the mobile phase, the retention of both analytes increased significantly compared to the mobile phases without the presence of methanol. With the addition of methanol to the mobile phase, the retention of both analytes increased significantly compared to the mobile phases with acetonitrile, resp. propan-2-ol.