

The aim of the bachelor thesis was to evaluate and compare interaction/separation properties of three chromatographic columns, namely XBridge C18, XSelect CSH C18 XSelect HSS C18, designed for reversed-phase high performance liquid chromatography. All the columns contain the same ligand, i.e. octadecyl but they differ in the stationary phase support. The columns were compared in terms of silanol activity, hydrophobicity, shape selectivity and efficiency. For this purpose, the simple chromatographic tests designed by Walters, Engelhardt and Galushko were used. Furthermore, the separation of five selected pesticides, namely acetochlor, fomesafen, isoproturon, metazachlor triflumuron, were optimized on tested columns in simple mobile phases composed of acetonitrile or methanol as organic modifiers and water.

All the tested columns showed low silanol activity and medium to high hydrophobicity according to the chromatographic tests used. The low silanol activity correlates with endcapping procedure used for all the columns. All pesticides were more retained in methanolic mobile phase due to the lower elution strength of methanol compared to acetonitrile in reversed-phase high performance liquid chromatography. The analysis time of separation varied for each column under the same chromatographic conditions. The shortest analysis time was achieved on the XBridge C18 column, which also showed the highest efficiency. On the other hand, the highest analysis time and the lowest efficiency were observed for XSelect HSS C18 column.